COST ACTION TU1208

CIVIL ENGINEERING APPLICATIONS OF GROUND PENETRATING RADAR

Booklet of Participants and Institutions (II Edition)

Editors: Lara Pajewski & Andrea Benedetto

cost
EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

TU1208 Basic Info
Start - End of Action: 4 April 2013 - 3 April 2017

Chair of the Action:
Dr. Lara Pajewski
Roma Tre University, IT
lara.pajewski@uniroma3.it

Vice-Chair of the Action:
Prof. Andreas Loizos
National Technical University of Athens, EL

COST TUD DC Chair:
Prof. Cristina Pronello
Politecnico di Torino, IT

COST TUD DC Rapporteur:
Dr. Goran Mladenovic
University of Belgrade, RS

COST Science Officer:
Dr. Mickael Pero
COST Office, BE

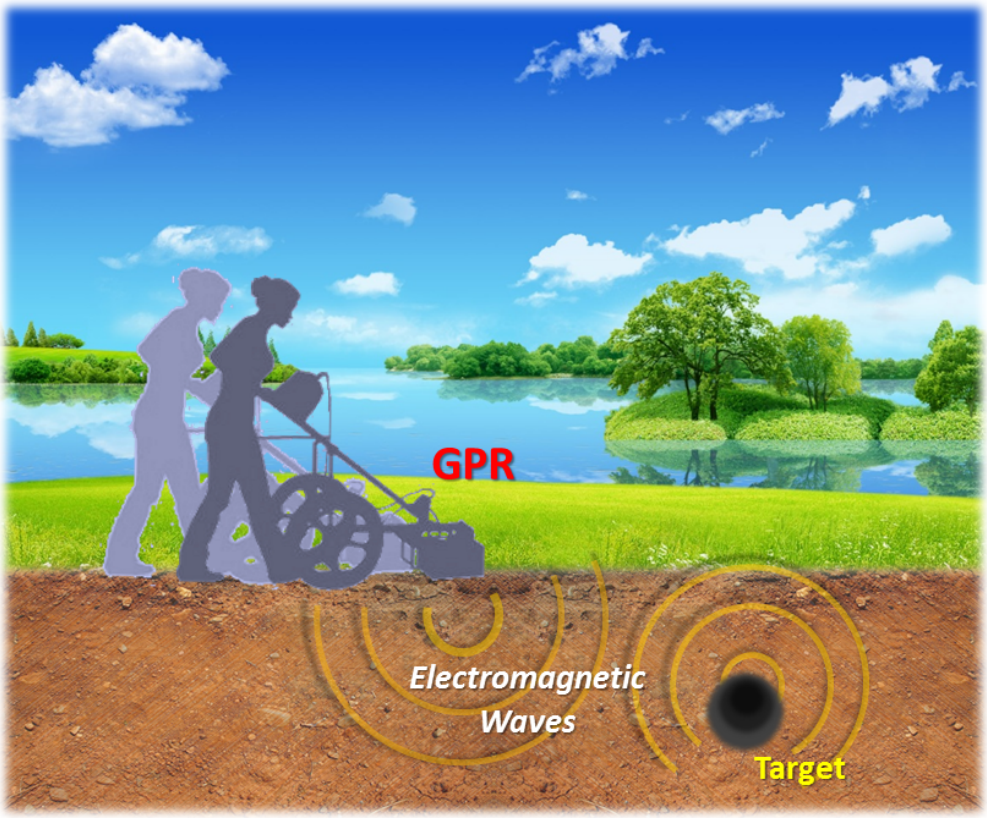
COST Administrative Officer:
Ms. Carmencita Malimban
COST Office, BE

Grant Holder:
Roma Tre University, Department of Engineering, IT

Editorial Coordinator of the Action:
Prof. Andrea Benedetto
Roma Tre University, IT

Chairs of Working Groups (WGs):
- WG1: Dr. Guido Manacorda, IDS Ingegneria dei Sistemi, IT
- WG2: Dr. Christina Plati, National Technical University of Athens, EL
- WG3: Dr. Antonis Giannopoulos, University of Edinburgh, UK
- WG4: Dr. Immo Trinks, Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology, AT

Short-Term Scientific Missions (STSMs) Manager:
Prof. Marian Marciniak
National Institute of Telecommunications, PL



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1. COST Action TU1208 "Civil Engineering Applications of Ground Penetrating Radar"

2. COST Action TU1208 “Civil Engineering Applications of Ground Penetrating Radar”

PREFACE
TO THE BOOKLET OF PARTICIPANTS AND INSTITUTIONS (II EDITION)

COST ACTION TU1208
"CIVIL ENGINEERING APPLICATIONS OF GROUND PENETRATING RADAR"

Founded in 1971, COST (European COoperation in Science and Technology) is the first and widest European framework for the translational coordination of nationally funded research activities. It is based on an inter-governmental agreement and currently comprises 36 European Countries plus one Cooperating State. COST's mission is to strengthen Europe's scientific and technical research capacity by supporting cooperation and interaction between European researchers, covering from basic to applied and technological research, and including research addressing issues of pre-normative nature or of particular social importance. COST is funded from the European Research and Technological Development (RTD) Framework Programmes budget. Nowadays, it is therefore funded by the Horizon2020 programme.

COST operates through Actions, science and technology networks with a duration of four years. COST Actions are active through a range of networking tools, such as meetings, conferences, workshops, short-term scientific missions, training schools, publications, and dissemination activities. COST currently supports over 300 Actions, running in nine scientific domains embracing all fields of research: Biomedicine and Molecular Bioscences; Chemistry and Molecular Sciences and Technologies; Earth System Science and Environment Management; Food and Agriculture; Forests and their Products and Services; Individuals, Societies, Cultures and Health; Information and Communication Technologies; Materials, Physics, and Nanosciences; and Transport and Urban Development (TUD). COST also supports research networks spanning over several scientific domains (trans-domain) with broad, interdisciplinary dimension, as well as targeted networks aiming at strengthening the role that COST plays in a given policy domain, stimulating the strategic development of future-oriented societal challenges, and contributing to European policy goals.

COST has a bottom-up approach: The idea and subject of a COST Action comes from the scientists themselves. COST fosters inclusiveness and equality of access, focuses strongly on providing networking opportunities for early career investigators, and commits to build capacity by connecting high-quality scientific communities throughout Europe and worldwide (cooperation with 18 Near Neighbour Countries and with International Partner Countries is indeed encouraged, on the basis of

mutual benefit). Furthermore, COST aims at increasing the impact of research on policy makers, regulatory bodies, and national decision-makers, as well as on the private sector.

More information on COST, as well as a list of completed and running Actions, is available on www.cost.eu.

The COST Action TU1208 was launched in April 2013 and will end in April 2017; it is running in the TUD domain. The main objective of the Action is to exchange and increase scientific and technical knowledge and experience on Ground Penetrating Radar (GPR) techniques in civil engineering, while promoting a wider and more effective use of this safe and non-destructive technique.

The scientific structure of the Action includes four Working Groups. Working Group 1 focuses on the design of novel GPR instrumentation. Working Group 2 deals with the development of guidelines for the surveying of transport infrastructures and buildings and for the sensing of underground utilities and voids. Working Group 3 studies electromagnetic forward and inverse methods for the solution of near-field scattering problems by means of buried structures and data-processing techniques. Working Group 4 is concerned with applications of GPR outside from the civil engineering field and with integration of GPR with other non-destructive testing techniques.

The TU1208 Working Groups are organized in Projects, as reported in the following.

- WORKING GROUP 1: NOVEL GPR INSTRUMENTATION
  - Project 1.1: Design, realisation and optimisation of innovative GPR equipment for the monitoring of critical transport infrastructures and buildings, and for the sensing of underground utilities and voids.
  - Project 1.2: Design, modelling, and optimisation of innovative GPR antennas.

- WORKING GROUP 2: GPR SURVEYING OF PAVEMENTS, BRIDGES, TUNNELS AND BUILDINGS; UNDERGROUND UTILITY AND VOID SENSING
  - Project 2.1: Innovative inspection procedures for effective GPR surveying of critical transport infrastructures (pavements, bridges and tunnels).
  - Project 2.2: Innovative inspection procedures for effective GPR surveying of buildings.
  - Project 2.3: Innovative inspection procedures for effective GPR sensing and mapping of underground utilities and voids, with a focus to urban areas.

- Project 2.4: Innovative procedures for effective GPR inspection of construction materials.
- Project 2.5: Determination, by using GPR, of the volumetric water content in structures, sub-structures, foundations and soil.

- WORKING GROUP 3: ELECTROMAGNETIC METHODS FOR NEAR-FIELD SCATTERING PROBLEMS BY BURIED STRUCTURES; DATA PROCESSING TECHNIQUES
  - Project 3.1:Electromagnetic modelling for GPR.
  - Project 3.2:Inversion and imaging for GPR.
  - Project 3.3:Intrinsic models for describing near-field antenna effects, including antenna-medium coupling, for improved radar data processing using full-wave inversion.
  - Project 3.4:GPR data processing techniques.

- WORKING GROUP 4: DIFFERENT APPLICATIONS OF GPR AND OTHER NON-DESTRUCTIVE TESTING TECHNOLOGIES IN CIVIL ENGINEERING
  - Project 4.1:Applications of GPR and other non-destructive testing methods in archaeological prospecting and cultural heritage diagnostics.
  - Project 4.2:Application of GPR to vital signs detection and to the localisation of buried and trapped people.
  - Project 4.3:Applications of GPR, in association with other non-destructive testing methods, in surveying of transport infrastructures.
  - Project 4.4:Applications of GPR, in association with other non-destructive testing methods, in building assessment and in geological/geotechnical tasks.
  - Project 4.5:Development of other advanced electric and electromagnetic methods for the characterisation of construction materials and soil.
  - Project 4.6:Applications of GPR, in association with other non-destructive testing methods, in the management and protection of water resources.

The Action TU1208 currently is a wide network involving participants from 28 COST Countries (Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, former Yugoslav Republic of Macedonia, Germany, Greece, Ireland, Latvia, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and United Kingdom), one COST Cooperating State (Israel), six COST Near Neighbour Countries (Albania, Armenia, Egypt, Jordan, Russia, and Ukraine), and five COST International Partner Countries (Australia, Hong Kong Special Administrative Region of the People's Republic of China, Philippines, Rwanda, and U.S.).

The total number of Action's Members is 264 (239 from COST Member Countries, 13 from NNCs and 12 from IPCs). The total number of Institutions is 132 (114 from COST Member Countries, 8 from NNCs and 10 from IPCs). University researchers, software developers, civil and electronic engineers, archaeologists, geophysicists, non-destructive testing equipment designers and manufacturers, end users from private companies, and stakeholders from public agencies are actively involved in the Action research projects and initiatives.

This booklet includes two parts.

The first part is devoted to presenting the Action's Members. For each person, the full contact details are reported, a biographical sketch, information about her/his experience on the Action's topics, participation to other COST Action and role in TU1208.

The second part of the volume is devoted to presenting the Institutions involved in TU1208. For each institute, information is reported concerning the research activities carried out on the Action's topics, the available GPR equipment, as well as further available equipment and software useful for the Action's activities.

We would like to thank very much all the Action Members who contributed to this volume by preparing their personal pages and the pages about their institutions. We are deeply grateful to COST for funding the Action TU1208 "Civil Engineering Applications of Ground Penetrating Radar" and the publication of this volume.

Lara Pajewski, Chair of the COST Action TU1208
Andrea Benedetto, Editorial Coordinator of the COST Action TU1208

7. COST Action TU1208 “Civil Engineering Applications of Ground Penetrating Radar”

COST ACTION TU1208
PARTICIPANTS

9. COST Action TU1208 “Civil Engineering Applications of Ground Penetrating Radar”

ALBANIA

HAMZA REÇI

Researcher in Geophysics
Institute of Geosciences, Energy, Water & Environment
Polytechnic University of Tirana
Str. Don Bosko, nr.60, 1024 Tirana, Albania
Phone: +355 672760 176, Fax: +355 42 259 540
e-mail: reci.jack@gmail.com, h.reci@geo.edu.al

Biographical sketch - Main experience in the Action's topics

Hamza Reçi received the engineering geophysicist degree in the faculty of Geology and Mines of Polytechnic University of Tirana (PUT) at 1994 and the PhD in Geophysics from Aristotle University of Thessaloniki (AUTH), Department of Geophysics, in 2003. In 2007, he received the MBA degree from Faculty of Economy, Tirana University & Lincoln University of Nebraska (USA). From 2004-2008, he was Researcher in Geophysics at Department of Earthquake monitoring, Institute of Seismology, Academy of Sciences of Albania. Since 2008, he is researcher in geophysics, at department of regional and engineering geophysics, at Institute of Geosciences, Energy, Water& Environment, PUT. Since 2004 he is involved in teaching activity at the faculty of Geology and Mines in the geophysical branch of PUT, mainly in potential fields. He is the author/co-author of about 60 scientific works on books, journals, and conference proceedings. During postgraduate studies (1997-2004), he participated in several projects in Greece, with the applied geophysics team of Geophysical Department of AUTH using GPR technique at different archaeological sites and water leakage in urban areas. Currently, his main research interests are in applied geophysics such as magnetic & gravity, resistivity & electromagnetic, GPR and seismic methods for environmental and engineering applications. From 2003-2008 he was member of American Geophysical Union and he is member of Balkan Geophysical Society. He is reviewer of the Albanian Journal of Technical and Natural Sciences and EAGE proceedings.

Participation to other COST Actions

No.

Recent publications on the Action's topics

- H. Reci, I. Jata, S. Bushati, 2015. ERT Method for the detection of buried archaeological objects in Apollonia & Bylis, Albania, Romanian Reports in Physics, Vol. 67, No. 2, 2015.
- H. Reci, Y. Muceku, I. Jata, 2013. The Use of ERT for Investigation of Berzhita Landslide, Tirana Area, Albania, Landslides and Monitoring, 2013, pp 117-123, Springer Edition.

Role in COST Action TU1208

- MC Observer from NNC. WG Member (WG3: Projects 3.2; WG4: Projects 4.1, 4.3-4.6).

ARMENIA

HOVIK BAGHDASARYAN
Professor
State Engineering University of Armenia
Faculty of Radio Engineering & Communication Systems
105 Terian street, 0009 Yerevan, Armenia
Phone: +374 99 110 547, Fax: +374 10 545 843
e-mail: hovik@seua.am

Biographical sketch
Hovik Baghdasaryan received the Doctorate in Physics and Mathematics from Radiophysics and Electronics Institute at National Academy of Armenia in 1980. Main scientific interest was and is up to now numerical analysis of strong electromagnetic wave interaction with non-linear (intensity dependent) multilayer and modulated media. He is an originator of the method of single expression, an alternative approach in boundary problems solution. From 1999 is scientific committee member of ICTON conferences. He is author/co-author of more than 100 works on books, journals and conference proceedings. Member of OSA and reviewer of different photonic's journals (OSA and IEEE).

Main experience in the Action's topics
Development of frequency-domain non-traditional method for boundary problems solution in linear and non-linear (intensity dependent) electromagnetism.

Recent publications on the Action's topics
- H.V. Baghdasaryan, "Basics of the Method of Single Expression: New Approach for Solving Boundary Problems in Classical Electrodynamics". Monograph: Yerevan, 2013. ISBN: 978-9939-55-972-8 (in English).
- H.V. Baghdasaryan et al. "Absorption loss influence on optical characteristics of multilayer distributed Bragg reflector: wavelength-scale analysis by the method of single expression", Opto–Electronics Review, vol. 18, Issue 4, 2010, pp. 438–445.

Participation to other COST Actions
COST Action 240 (ended in 1998); COST Action 267 (ended in 2002); COST Action 268 (ended in 2002); COST Action MP0702 "Towards Functional Sub-Wavelength Photonic Structures" (ended in 2012).

Role in COST Action TU1208
MC Observer from NNC. WG Member (WG3: Projects 3.1, 3.2).

WAYNE MULLER
Department of Transport and Main Roads,
Brisbane, Queensland, Australia
e-mail: wayne.b.muller@tmr.qld.gov.au

Role in COST Action TU1208
MC Observer from IPC. WG Member (WG2: Project 2.1). WG Associate Member (WG1).

AUSTRIA

IMMO TRINKS

Head of Research & Development
Ludwig Boltzmann Inst. for Archaeol. Prosp. & Virtual Archaeology
Hohe Warte 38, 1190 Vienna, Austria
Phone: +43 699 1520 6508
e-mail: immo.trinks@archpro.lbg.ac.at

Biographical sketch

Immo Trinks received a PhD in geophysics from Cambridge University in 2004. Between 2005 and 2010 he established within the Swedish National Heritage Board a working group on near-surface geophysical archaeological prospection. In 2010 he joined as founding member the Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology. Trinks is author of scientific conference proceedings, articles, chapters in books and editor of proceedings, co-organizer of the 10th International Conference on Arch. Prospection, reviewer for Near Surface Geophysics, Archaeological Prospection, Journal of Geophysics and Engineering and Water Resources Research, and invited independent expert referee for the ERC. He is member of the EU Ass. of Geoscientists & Eng.s, the Intl. Soc. for Arch. Prosp. and the Austrian Geophysical Soc.

Main experience in the Action's topics

- Development and test of GPR systems for efficient, high-resolution, large-scale prospecting
- New methods for processing, imaging and interpretation of large-scale high-resolution GPR data.
- Large-scale applications of GPR in archaelogical prospection and engineering applications.

Recent publications on the Action's topics

- W. Neubauer, I. Trinks, RB. Salisbury, C. Einwögerer (Editors). Archaeological Prospection - Proceedings of the 10th International Conference on Archaeological Prospection Vienna, May 29th – June 2nd 2013. Austrian Academy of Sciences, 2013.
- C. Gaffney, V. Gaffney, W. Neubauer, E. Baldwin, H. Chapman, P. Garwood, H. Moulden, T. Sparrow, R. Bates, K. Löcker, A. Hinterleitner, I. Trinks, E. Nau, T. Zitz, S. Floery, G. Verhoeven, and M. Doneus. The Stonehenge Hidden Landscapes Project. Archaeological Prospection, 19(2): 147–155, 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG4 Chair. Financial Rapporteur.

WOLFGANG NEUBAUER
Ludwig Boltzmann Inst. for Archaeol. Prosp. & Virtual Archaeology
Vienna, Austria
e-mail: wolfgang.neubauer@archpro.lbg.ac.at

Role in COST Action TU1208
MC Substitute Member. WG Member (WG4: Project 4.1).

ALOIS HINTERLEITNER
Ludwig Boltzmann Inst. for Archaeol. Prosp. & Virtual Archaeology
Vienna, Austria
e-mail: alois.hinterleitner@archpro.lbg.ac.at

Role in COST Action TU1208
WG Member (WG4: Project 4.1).

SIRRI SEREN
Zentralanstalt für Meteorologie und Geodynamik
Vienna, Austria
e-mail: sirri.seren@zamg.ac.at

Role in COST Action TU1208
WG Member (WG4: Project 4.1).

Belgium

ALBÉRIC DE COSTER

PhD - Research assistant
Earthand Life Institute – Environmental Sciences
Université catholique de Louvain (UCL)
Croix du Sud, 2 box L7.05.02, 1348 Louvain-la-Neuve, Belgium - Phone: +32 10473539,
Email: alberic.decoster@uclouvain.be

Biographical sketch

Albéric De Coster received the M.Sc. degrees in Agricultural and Environmental Engineering from the Université catholique de Louvain (UCL), in 2012. At the end of the same year, he received the Ernest du Bois' prize for his master thesis entitled "The potential of pitcher irrigation in Eastern Morocco". After his studies, he worked at UCL as a research assistant during six months on two projects. The first one was undertaken in collaboration with Bruxelles Environment (IBGE) and dealt with the nitrate contamination sources of the Brusselian Sands groundwater body (Belgium). The second one was related to pollutant transfers within the vadose zone. He joined the hydrogeophysic's research group at UCL in April 2013 to work on the SENSPORT project in the framework of the WBGreen research program of the Walloon Region. The objective of this project is to detect underground pipes in water supply system and to estimate the water content around these pipes with the GPR.

Main experience in the Action's topics

- Antenna calibration in near-field and far-field conditions.
- Impact of the antenna offset and number of frequencies on layered media reconstruction using full-wave inversion (numerical and laboratory experiments).
- Applications of Ground Penetrating Radar in environmental engineering.

Recent publications on the Action's topics

- De Coster A., Tran A.P. and Lambot S., "Influence of the antenna offset and number of frequencies on parameter retrieval for planar layered media in near-field conditions", IEEE Trans. Geoscience and Remote Sensing, 2014.
- A. De Coster, A.P. Tran and S. Lambot, " Impact of the antenna offset and the number of frequencies on layered media reconstruction using full-wave inversion in near-field conditions", in Proc. 15th Intl Conference on Ground Penetrating Radar - GPR2014.

Participation to other COST Actions

No.

Role in COST Action TU1208

Leader of Project 4.6. WG Member (WG2: Projects 2.3-2.5; WG3: Projects 3.2, 3.3).

Belgium

JAN DE PUE
Researcher in Soil Physics
Ghent University - Departement of Soil Management
Coupure links 653, B-9000 Ghent, Belgium
Phone.: +32 (0)9 264 60 58
Fax: +32 (0)9 264 62 47
e-mail: jan.depue@ugent.be

Biographical sketch
Graduated as Master of Science in Bioscience Engineering: Land and Water Management in 2012, Jan started working as assistant of the Soil Physics research group at the Ghent University. His first steps with GPR were made during his master-thesis, which concerned the processing of frequency domain GPR data for subsurface object detection. Currently, his research focusses on subsurface characterization with non-invasive geophysical methods. More specifically, soil compaction is investigated with a combination of GPR, electromagnetic induction and seismic techniques.

Main experience in the Action's topics
- Image processing
- Velocity semblance analysis
- Modelling of electromagnetic waves for synthetic experiments
- Spectral estimation techniques, eg. MUSIC
- Wavelet analysis
- Geostatistical analysis

Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Project 2.5; WG4: Project 4.5).

Belgium

COLETTE GRÉGOIRE
Researcher in Geotechnics
Belgian Road Research Centre (BRRC)
Boulevard de la Woluwe, 42
1200 Brussels, Belgium
Phone: +32 2 7660319 Fax.: +32 2 7671780
e-mail: c.gregoire@brrc.be

Biographical sketch
1996: Mining Engineer, Faculté Polytechnique Mons, Belgium. Thesis (In collaboration with CEN-SCK in Mol, Belgium). 'Modelling of hydro-mechanical behaviour of Boom clay'. 2001: PhD in Engineering. Title of thesis: 'Fracture characterisation by ground penetrating radar'. Numerical simulations, laboratory measurements and in-situ measurements were carried out. October 1996-September 2002: Research assistant at the Faculty of Engineering of the Katholiek Universiteit Leuven (KULeuven), Belgium. This position consists in teaching and leading practical works in geophysics (data processing, GPR, modelling) and research for a PhD on the quantitative interpretation of reflected GPR signals. 2002-2005: Doctor Research assistant at the Faculty of Engineering of the Katholiek Universiteit Leuven (KULeuven), Belgium. This position consists in teaching and leading practical works in geophysics (data processing, GPR, modelling) and further research in geophysics. From 2005: Researcher in the department Geotechnics - Environment of the Belgian Road Research Centre (BRRC). This position consists in working on projects related to road infrastructure (base layers and subgrade), more orientated in geotechnics, plus projects related to road investigation with GPR.

Main experience in the Action's topics
Applications of Ground Penetrating Radar in road structure assessment (layer thickness, homogeneous zones, road defects).

Recent publications on the Action's topics
- C. Grégoire and C. Van Geem, Use of radar in road investigation. IWAGPR 2013, Nantes, July 2013.
- C. Van Geem & C. Grégoire, 2013, Rehabilitation of roads containing cobblestone pavements covered with a bituminous layer. BCR2A Conf., Trondheim.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.1, 2.2, 2.5).

Belgium

SÉBASTIEN LAMBOT

Professor, FNRS researcher
Earth and Life Institute – Environmental Sciences (ELI-e)
Université catholique de Louvain (UCL)
Croix du Sud, 2 box L7.05.02, 1348 Louvain-la-Neuve,
Belgium - Phone: +32 10 473711
e-mail: sebastien.lambot@uclouvain.be

Biographical sketch

Sébastien Lambot received the M.Sc. and Ph.D. degrees in Agricultural and Environmental Engineering from the Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium, in 1999 and 2003, respectively. He was with the Delft University of Technology, Delft, The Netherlands, from 2004 to 2005, as a European Marie-Curie Post-doctoral Scientist. From 2006 to 2012, he was with Forschungszentrum Jülich, Jülich, Germany, as a Research Group Leader. Since 2006, he has been a Professor and FNRS Researcher at UCL. His current research interests include hydrogeophysics and GPR and EM induction forward and inverse modeling for the remote characterization of soil properties. He was the General Chair of the 3rd Int. Workshop on Adv. GPR in 2005 and oganized the 15th International Conference on Ground Penetrating Radar in 2014. He is an Associate Editor for the Vadose Zone Journal.

Main experience in the Action's topics

- Full-wave methods for the solution of electromagnetic forward-scattering problems including in particular antennas and three-dimensional layered structures.
- Development of full-wave inversion techniques for the retreival of soil and material electrical properties (non-destructive testing).
- Applications of Ground Penetrating Radar in environmental and civil engineering.
- Experimental characterization of antennas in near- and far-field conditions.

Recent publications on the Action's topics

- S. Lambot and F. André, "Full-wave modeling of near-field radar data for planar layered media reconstruction," IEEE Trans. on Geosc. and Remote Sensing, in press, Jan 2014.
- S. Lambot, F. André, E. Slob, and H. Vereecken, "Effect of antenna-medium coupling in the analysis of ground-penetrating radar data," Near Surface Geoph., vol. 10, 631-639, 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

Leader of Project 3.3. WG Member (WG2: Projects 2.1, 2.2-2.5; WG3: Projects 3.1-3.4). Interested also in WG4 activities (Projects 4.3-4.6). Chair GPR 2014 Conference.

Belgium

LAURENCE MERTENS
Research assistant
Earth and Life Institute–Environmental Sciences (ELI-e)
Université catholique de Louvain (UCL)
Croix du Sud, 2 box L7.05.02, 1348 Louvain-la-Neuve,
Belgium - Phone: +32 10 473539
e-mail: laurence.mertens@uclouvain.be

Biographical sketch
Laurence Mertens received the M.Sc. degrees in Agricultural and Environmental Engineering from the Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium, in 2011. She worked at the Royal Meteorologigical Institute of Belgium (RMIB) for eight months, then joined the hydrogeophysic's research group at UCL. Her research interests focus on high resolution ground penetration radar imaging, in particular for forestry applications, and near-field electromagnetic modelling.

Main experience in the Action's topics
- Development of a physically-based correction for time-domain radar to account for time and amplitude drift of the source signal.
- Applications of Ground Penetrating Radar in environmental and civil engineering.
- Experimental characterization of antennas in near- and far-field conditions.
- Filtering far- and near-field radar antenna effects.

Recent publications on the Action's topics
- Mertens L. and S. Lambot, "Improvement of near field subsurface imaging with a physically-based filtering of near-field antenna coupling" in preparation.
- Mertens, L., A.P. Tran, and S. Lambot, Towards physically-based filtering of the soil surface, antenna and coupling effects from near-field GPR data for improved subsurface imaging., in IWAGPR 2013 Nantes.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.1, 2.3-2.5; WG3: Projects 3.1-3.4).

Belgium

FRÉDÉRIC NGUYEN
Professor
Applied Geophysics, Geo^3
Université de Liège BAT. B52 Département ArGEnCo
chemin des Chevreuils, 1 4000 Liège Belgium
Phone: +3243663797 - Fax: +3243669520
e-mail: f.nguyen@ulg.ac.be

Biographical sketch
Frédéric Nguyen obtained his PhD degree at the Université de Liège in 2005 dedicated to the development and application of geophysical methods to detect and image active faults. During his PhD research, his main interests were to develop methodologies based on image and signal processing to objectively interpret electrical resistivity data and seismic data for shallow surveys. From a seismic hazard point of view, his research allowed unveiling surface ruptures associated with the strongest earthquake recorded in France (Provence) in the 20th century. He then worked as a post-doctoral researcher at the Forschungszentrum Jülich within the framework of the European project ALERT on the sustainable management of water resources by automated real-time monitoring in coastal aquifers. His research interest then shifted towards environmental geophysics and inverse problems. Of particular research interest were the development of image appraisal quantities and time-lapse inversion schemes. Since 2007, he is a Professor in Applied Geophysics at the University of Liège and he was appointed in 2010 as a part-time Professor at KULeuven. The research focus of his group lies on solving geophysical inverse problems and associated topics (e.g. uncertainty analysis) and on the integration of geophysical data in highly multidisciplinary fields of research (geothermy, bioremediation, concrete in civil engineering).

Main experience in the Action's topics
- Development of analytical solutions for thin layers in concrete.
- Applications of Ground Penetrating Radar in environmental and civil engineering.
- Characterization of thin layers into concrete with GPR.

Recent publications on the Action's topics
- Van der Wielen, A., Courard, L., & Nguyen, F. (2014). Detection of near-field, low permittivity layers with Ground Penetrating Radar: analytical estimation of the reflection coefficient. In Proc. of 15th International Conference on ground Penetrating Radar.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1-4.5).

Belgium

DENIS TIHON

Research assistant in Electromagnetics
Université Catholique de Louvain – Elen,
ICTEAM Place du Levant 3, 1348,
Louvain-la-Neuve, Belgium
Phone: 0032 10 472060
e-mail: denis.tihon@uclouvain.be

Biographical sketch

Denis Tihon received is Master degree in civil engineering on june 2013, with a high distinction. He worked in the field of the metamaterials and image processing during its master thesis, and more particularly on the solution of forward and inverse scattering problems for periodic arrangement of scatterers. He is continuing with a PhD thesis in Louvain-la-Neuve, studying the absorption of light by metamaterials for space imaging. This study includes the solution of forward scattering problems to design the material used and the solution of inverse scattering to treat the data gathered.

Main experience in the Action's topics

- Simulation and solution of scattering problems with periodic scatterers using integral equation techniques.
- Simulation of forward scattering problems for an isolated scatterer in front of periodic scatterers
- Development of numerical technique for the solution of inverse scattering problems with periodic scatterers.

Recent publications on the Action's topics

D. Tihon, N.A. Ozdemir, C. Craeye (2013, September) "Near-field Imaging with Metamaterial Deconvolution of An Image Using SVD", Poster presented at the Metamaterials' 2013 conference, Bordeau, France.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Associate Member (WG3).

BELGIUM

ELLEN VAN DE VIJVER
Research Assistant
Ghent University – Department of Soil Management
Coupure links 653, 9000 Gent, Belgium
Phone: +32 09 2645869 Fax: +39 09 2646247
e-mail: ervdevij.vandevijver@ugent.be

Biographical sketch

Ellen Van De Vijver received the M.Sc. degree in Bioscience Engineering: Environmental Technology from Ghent University in 2010. In September 2010 she started working as research assistent at the Department of Soil Management of Ghent University. As a member of the Research Group Soil Spatial Inventory Techniques, Ellen teaches the practical parts of courses on geostatistics, soil spatial inventory techniques and soil contamination and remediation. Her PhD research addresses the application of geophysical sensors on industrial and urban sites to investigate soil contamination. Currently, the main focus of her research is on the combination of multi-receiver electromagnetic induction and stepped frequency GPR for characterizing soil contamination with petroleum hydrocarbons.

Main experience in the Action's topics

- Application of electromagnetic induction and GPR on industrial and urban sites.
- Integration of GPR and electromagnetic induction data.
- Comparison of stepped-frequency continuous wave GPR and dual-frequency impulse GPR.
- Case studies on the use of GPR for archeaological prospection and civil engineering.

Recent publications on the Action's topics

- De Pue, J., Van De Vijver, E., Cornelis, W. and Van Meirvenne, M., Comparison of pulse and SFCW GPR in time, frequency and wavelet domain. In: Geophysical Research Abstracts, Vol. 16, EGU2014-16072-3, 2014. EGU General Assembly 2014, Vienna, Austria
- Van De Vijver, E., Saey, T., De Smedt, P., Meerschman, E., Delefortrie, S., Seuntjens, P. and Van Meirvenne, M., Combining electromagnetic induction and ground penetrating radar for industrial site characterization. In: Proceedings of the 3rd Global Workshop on Proximal Soil Sensing 2013, Leibniz-Institute for Agricultural Engineering Potsdam-Bornim, Potsdam, Germany, 193-195

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG4: Project 4.5).

BELGIUM

MARC VAN MEIRVENNE

Professor in Soil Inventory Techniques
Ghent University – Department of Soil Management
Coupure 653, 9000 Gent, Belgium
Phone: +32 09 2646056 Fax: +39 09 2646247
e-mail: marc.vanmeirvenne@ugent.be

Biographical sketch

Marc Van Meirvenne obtained his PhD on the application of Geostatistics in Soil Science in 1991. Since 1993 he is professor at this Ghent Univ. He is leading the Research Group Soil Inventory Techniques and Head of the Dpt. of Soil Management. He is the author/co-author of more than 120 papers and member of the editorial board of the journals "Geoderma" and "Precision Agriculture". He was promoter of 17 PhD's and a large number of research projects (national and international). His main research interest is in developing techniques to improve the inventory and mapping of soil properties, both on-site and by data processing. This includes the optimisation of sampling strategy, non-destructive soil sensing and post-processing models. Currently his team deploys several electromagnetic induction sensors and a stepped-frequency continuous wave GPR with antenna-array. The activities have applications in agriculture, archaeology, environmental and civil engineering.

Main experience in the Action's topics

- Use of stepped-frequency continuous wave GPR with antenna-array.
- Applications of GPR in agriculture, archaeology, environmental pollution and civil eng.
- Integration of electromagnetic induction with GPR.

Recent publications on the Action's topics

- De Smedt P., Saey T., Lehouck A., Stichelbaut B., Van De Vijver E., Islam M.M., Meerschman E. & Van Meirvenne M., 2013. Exploring the potential of multi-receiver EMI survey for archaeological prospection: a 90 ha dataset. Geoderma, 199: 30-36.
- Saey T., Stichelbaut B., Bourgeois J., Van Eetvelde V. & Van Meirvenne M., 2013. An interdisciplinary non-invasive approach to landscape archaeology of the Great War. Archaeological Prospection, 20:39-44.

Participation to other COST Actions

No.

Role in COST Action TU1208

Leader of Project 4.5. WG Member (WG2: Projects 2.1, 2.5; WG4: Projects 4.1, 4.5).

Belgium

CARL VAN GEEM

Researcher in road management and monitoring techniques
Belgian Road Research Centre (BRRC)
Boulevard de la Woluwe 42, 1200 Brussels, Belgium
Phone: +32 10 23 65 22 Fax: +32 2 7671780
e-mail: c.vangeem@brrc.be

Biographical sketch

1996: Doctor in technical sciences (technical mathematics), from the Research Institute on Symbolic Computation (RISC-Linz), Johannes Kepler University Linz, Austria. 2004 - now: Researcher at the BRRC, in the division of mobility, security and road management (MSM). In his position Carl is responsible for the activities related to road maintenance management. The BRRC disposes of several monitoring devices for the evaluation of surface caracteristics (roughness, skid resistence), for pavement management (visual inspection device "SAND"), and for bearing capacity of road structures (FWD, Curviameter, GPR). The topic of Carl's research is the interpretation of data obtained with these monitoring devices for optimal road maintenance management. Carl participated in national and international research projects and working groups, such as a "national pre-normative research project on the indicators of roughness", the COST action 354 on "Performance Indicators for Road Pavements", the PIARC technical committee D1 "Management of Road Infrastructure Assets", and in the ongoing EC FP7 project "Tomorrow's Road Infrastructure Monitoring and Management (TRIMM)".

Main experience in the Action's topics

Applications of GPR in road structure assessment (layer thickness, homogeneous zones, road defect,…) combined with deflection measurements and back calculation of moduli.

Recent publications on the Action's topics

- C. Van Geem and C. Gregoire, Rehabilitation of roads containing cobblestone pavements covered with a bituminous layer. BCR2A conference, Trondheim, June 2013.
- C. Gregoire and C. Van Geem, Use of radar in road investigation. IWAGPR 2013, Nantes, July 2013.

Participation to other COST Actions

COST Action 354 "Performance Indicators for Road Pavements."

Role in COST Action TU1208

WG Member (WG4: Project 4.3).

CRISTOPHE CRAEYE
Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium
e-mail: cristophe.craeye@uclouvain.be

Role in COST Action TU1208
MC Substitute Member. WG Member (Project 1.1).

SAMUEL DELEFORTRIE
Ghent University – Department of Soil Management
Gent, Belgium
e-mail: samuel.delefortrie@ugent.be

Role in COST Action TU1208
WG Member (WG4: Project 4.5).

PHILIPPE DE SMEDT
Ghent University – Department of Soil Management
Gent, Belgium
e-mail: philippe.desmedt@ugent.be

Role in COST Action TU1208
WG Member (WG4: Projects 4.1, 4.5).

JANA JEZOVA
Earth and Life Institute–Environmental Sciences (ELI-e)
Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium
e-mail: jana.jezova@uclouvain.be

Role in COST Action TU1208
WG Member (WG3: Project 3.3).

NICOLAS MORMEAUX
Earth and Life Institute–Environmental Sciences (ELI-e)
Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium
e-mail: nicolas.mourmeaux@uclouvain.be

Role in COST Action TU1208
WG Member (WG3: Project 3.3).

GABRIELA A. RODRIGUEZ
Earth and Life Institute–Environmental Sciences (ELI-e)
Université catholique de Louvain (UCL), Louvain-la-Neuve, Belgium
e-mail: gabriela.arambulo@uclouvain.be

Role in COST Action TU1208
WG Member (WG3: Project 3.3).

HICHEM SAHLI
Vrije Universiteit
Brussels, Belgium
e-mail: hichem.sahli@etro.vub.ac.be

Role in COST Action TU1208
WG Associate Member (WG3).

Croatia

MARIO BACIC

Assistant – Junior researcher
Faculty of Civil Engineering, University of Zagreb
Kaciceva 26, 10000 Zagreb, Croatia
Phone: +385 14639491 - Fax: +385 14827001
e-mail: mbacic@grad.hr

Biographical sketch

Mario Bacic works at the Faculty of Civil Engineering at the University of Zagreb, where he graduated in 2010. He is a junior researcher at the Department for Geotechnics. His area of interest includes non destructive testing in underground engineering, as well as seismic, electric and electromagnetic methods for soil and rock surveying. His work is also focused on non destructive testing of rockbolts for determination of rockbolt grouting quality. He is member of Croatian Society for Underground Construction, Croatian Geotechnical Society, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) and International Society for Rock Mechanics (ISRM).

Main experience in the Action's topics

- Applications of GPR in the engineering-geological domain (soil and rock surveying).
- Applications of GPR in the geotehcnical/hydrotechnical and geotechnical/railroad domain (embankments, railroad ballast).

Recent publications on the Action's topics

- D. Marčić, M. Bačić, M. Gazdek, "Application of geophysical investigations in underground engineering," Tehnički vjesnik, 2013.
- M. S. Kovačević, K. Martinović, M. Bačić, "Sustainable Ground Improvement in Underground Engineering," Proc. ENVIZEO Workshop, ed. I. Janotka, Bratislava, 2012.
- M. Bačić, D. Marčić, M. S. Kovačević, "A comparison of 2D and 3D numerical simulation for tunnel excavation accompanied by measurement results," Road and Rail Infrastructure II, Proc. Conference CETRA 2012, S. Lakušić, Dept. of Transportation, Faculty of Civil Eng., University of Zagreb, pp. 797-803, 2012.

Participation to other COST Actions

COST Action TU1206 (MC Member); COST Action TU1202 (MC Substitute Member).

Role in COST Action TU1208

MC Member. WG Member (WG2: Projects 2.1-2.5; WG4: Projects 4.2-4.5).

Croatia

JOSIPA DOMITROVIĆ
Faculty of Civil Engineering, University of Zagreb
Department of Transportation
Fra Andrije Kačića Miošića 26, 10000 Zagreb, Croatia
Phone: +385 01 4639240 - Fax: +385 01 4639240
e-mail: jdomitrovic@grad.hr

Biographical sketch

Josipa Domitrović is assistant - science novice at Department of Transportation engineering, Faculty of Civil Engineering, University of Zagreb. She graduated in 2009, and in the same year she enrolled in doctoral studies at Faculty of Civil Engineering, University of Zagreb. At Faculty she holds classes in subject's roads at undergraduate level, and Pavements and Airports at graduate level. Besides her teaching activities she also works as a laboratory assistant for quality control of geosynthetic materials. She is the author/co-author of several papers published in journals and conference proceedings. Her main research interests are in the field of pavement design, maintenance and management. Main focus of her scientific and professional work is optimization and rationalization of pavement design and construction, as well as introduction of non-destructive methods (GPR, Falling Weight Deflectometer) for evaluation of pavement condition into everyday use.

Main experience in the Action's topics

- Evaluation of pavement structures using a combination of Ground Penetrating Radar with Falling Weight Deflectometer.

Recent publications on the Action's topics

- M. Ožbolt, T. Rukavina, J. Domitrović, "Comparison of the Pavement Layers Thickness Measured by Georadar and Conventional Methods – Examples from Croatia", Baltic Journal of Road and Bridge Engineering, 7, 2012, 1, p. 30-35.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG2: Projects 2.1, 2.5; WG4: Project 4.3).

Croatia

LOVORKA LIBRIC
Assistant – Junior researcher
Faculty of Civil Engineering, University of Zagreb
Kaciceva 26, 10000 Zagreb, Croatia
Phone: +385 14639493 Fax: +385 14827001
e-mail: llibric@grad.hr

Biographical sketch

Lovorka Libric is a junior researcher at Faculty of Civil Engineering at University of Zagreb. Since 2010, when she graduated she works at Department of Geotechnics at Faculty of Civil Engineering at University of Zagreb. She works as an associate on geotechnical monitoring and geotechnical laboratory works. Her area of interests also include non-destructive testing methods and their usage in civil engineering, as well as comparison of different approach methods for ground investigation (electric, electromagnetic and seismic). She also participated in organisation of 'The First Croatian spelogical Congress'. She is member of is Croatian Socitey for Underground Construction, Croatian Geotechnical Society (HGD), International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) and International Society for Rock Mechanics (ISRM).

Main experience in the Action's topics

- Applications of GPR in the engineering-geological field (soil and rock surveying).
- Applications of GPR in the geotehcnical/hydrotechnical and geotechnical/railroad field (embankments, railroad ballast etc.).

Recent publications on the Action's topics

- Kovačević, Meho Saša; Martinović, Karlo; Librić, Lovorka. Sustainable Underground Engineering Centre (SUNEC), Adv. in underground space development, Zhou, Yingxin ; Cai, Jungang ; Sterling, Raymond (ur.).Singapore : Research Publ., 2012. 372-374
- Kovačević, Meho Saša; Mirčeta Antonia; Librić, Lovorka. The Stupica Tunnel – Rockfall Protection, Road and Rail Infrastructure II, Proc. of Conf. CETRA 2012, Lakušić, Stjepan (ur.). Zagreb : Dpt. of Transp., Faculty of Civil Eng., University of Zagreb, 2012. 789-796.

Participation to other COST Actions

COST Action TU1202 «Impact of climate change on engineered slopes for infrastructure» (MC Member).

Role in COST Action TU1208

MC Substitute Member. WG Member (WG2: Projects 2.3, 2.5; WG4: Projects 4.3, 4.4).

Croatia

DANIJELA MARCIC
Assistant professor
Faculty of Civil Engineering, University of Zagreb
Kaciceva 26, 10000 Zagreb, Croatia
Phone: +385 14639448 Fax: +385 14827001
e-mail: djk@grad.hr

Biographical sketch

Danijela Marcic, PhD is assistant professor at Department of Geotechnics, UNIZG-FCE Her area of interests include field and laboratory investigation works, geotechnical monitoring, as well as risk management in area of underground counstruction. She is currently involved in research of ground improvement methods and determination of degree of improvement by using non destructive methods. Dr. Marcic has published over 30 papers in journals and conference proceedings in the field of underground engineeering and risk management. As an associate, she has been involved in more than 40 projects in domain of underground engineering, among which are most significant underground engineering projects in Croatia in last few years. Dr. Marcic is Secretary of Croatian Socitey for Underground Construction, and she is a member of Croatian Geotechnical Society (HGD), International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) and International Society for Rock Mechanics (ISRM). She was co-organizer and of '1st Croatian Days of Underground Construction', Zagreb (2011.) and of '1st Croatian Speological Congess', Porec (2011).

Main experience in the Action's topics

- Applications of GPR in field of engineering-geological domain (soil and rock surveying) necessary for civil engineering projects.
- Applications of GPR in field of geotehcnical/hydrotechnical and geotechnical/railroad domain (embankments, railroad ballast etc.).

Recent publications on the Action's topics

- Marčić, Danijela; Cerić, Anita; Meho-Saša Kovačević. Selection of a Field Testing Method for Karst Rock Mass Deformability by Multi Criteria Decision Analysis, Journal of Civil Engineering and Management. 19 (2013) , 2; 196-205
- Danijela Marčić, Mario Bačić, Mario Gazdek. Application of geophysical investigations in underground engineering, Tehnički vjesnik/Technical Gazzette, 2013.

Participation to other COST Actions

COST Action TU1206 (MC Member); COST Action TU1202 (MC Substitute Member).

Role in COST Action TU1208

MC Member. WG Member (WG2: Projects 2.3, 2.5; WG4: Projects 4.3, 4.4).

DRAGAN POLJAK
Researcher in Electromagnetics
"University of Split, FESB" - Department of Electronics
R. Boskovica 32, HR-21000 Split, Croatia
Phone: +385 21 305 698 Fax: +385 21 305 776
e-mail: dragan.poljak @fesb.hr

Biographical sketch

Dr Poljak is the full professor at the Department of Electronics at the University of Split, the Adjunct Professor at Wessex Institute of Technology (WIT) and the member of Board of Directors of WIT. His research interests include frequency and time domain computational methods in electromagnetics, particularly numerical modeling of wire structures with applications to electromagnetic compatibility and bioelectromagnetics. To date prof. Poljak has published more than 50 journal and 150 conference papers, respectively, in the area of computational electromagnetics, 7 authored books and one edited book. Prof. Poljak is a member of the Editorial Board of some journals, books series and co-chairman of some conferences. He is also external examiner on PhD vivas on international universities. He is a reviewer for many outstanding journals such as IEEE, IET, Elsevier journals, etc..

Main experience in the Action's topics

- Development of full-wave and transmission line methods for the analysis of electromagnetic scattering problems pertaining to thin wire structures.
- Development of numerical methods for the freq. and time domain analysis of thin wire structures buried in a lossy half-space.
- Analysis and synthesis of wire antennas, lines, cables and lightning protection systems
- Assessment of human exposure to electromagnetic fields.

Recent publications on the Action's topics

- Poljak, D.; Shoory, A.; Rachidi, F.; Antonijević, S.; Sergey, T., Time-Domain Generalized Telegrapher's Equations for the Electromagnetic Field Coupling to Finite Length Wires Above a Lossy Ground, IEEE Trans. On Electr. Compatibility. 54 (2012), 1; 218-224
- Šesnić, S.; Poljak, D.; Tkachenko, S., Time Domain Analytical Modeling of a Straight Thin Wire Buried in a Lossy Medium, Progress in electromagnetics res., 121 (2011) ; 485-504

Participation to other COST Actions

COST Action BM1309 "European network for innovative uses of EMFs in biomedical applications" (MC Member).

Role in COST Action TU1208

MC Substitute Member. WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1-4.6).

Croatia

SILVESTAR ŠESNIĆ

Researcher in Electromagnetics
"University of Split, FESB" - Department of Power Engineering
R. Boskovica 32, HR-21000 Split, Croatia
Phone: +385 21 305 814 Fax: +385 21 305 776
e-mail: ssesnic@fesb.hr

Biographical sketch

Silvestar Šesnić was born in Split, Croatia in 1979. He received the B.Sc. and Ph.D. degrees in electrical engineering from the University of Split, Split, Croatia in 2002 and 2010, respectively. He also received M.Phil. degree in environmental electromagnetic compatibility from the University of Wales, UK in 2005. He is currently an Assistant Professor at the Department of Power Engineering, University of Split, Split, Croatia. He has published 29 journal and conference papers in the area of applied electromagnetics. His research interests include analytical modeling in electromagnetic compatibility, frequency and time domain analysis of thin wire structures and biomedical applications of electromagnetic fields, as well as modelling of tokamak plasma behavior.

Main experience in the Action's topics

- Development of full-wave methods for the analysis of electromagnetic scattering from thin wire structures.
- Development of analytical methods for the frequency and time domain analysis of thin wire structures buried in a lossy half-space.

Recent publications on the Action's topics

- S. Šesnić, D. Poljak and S. V. Tkachenko, "Analytical Modeling of a Transient Current Flowing Along the Horizontal Grounding Electrode," *IEEE Transactions on Electromagnetic Compatibility,* vol. 55, no. 6, pp. 1132-1139, 2013.
- S. Šesnić, D. Poljak and S. Tkachenko, "Time domain analytical modeling of a straight thin wire buried in a lossy medium," *Progress In Electromagnetics Research,* vol. 121, pp. 485-504, 2011.

Participation to other COST Actions

COST Action BM1309 "European network for innovative uses of EMFs in biomedical applications" (WG Member).

Role in COST Action TU1208

WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1-4.6).

TATJANA RUKAVINA
Full Professor - tenured position
Faculty of Civil Engineering, University of Zagreb
Department of Transportation
Fra Andrije Kačića Miošića 26, 10000 Zagreb, Croatia
Phone: +385 01 4639327 Fax: +385 01 4639240
e-mail: rukavina@grad.hr

Biographical sketch

Tatjana Rukavina is a Full Professor - tenured position and holds the "Pavement Structures", "Airports", "Pavement Management" and "Soil Stabilization" courses at Faculty of Civil Engineering, University of Zagreb. At the same time she is a head of the laboratory, for testing Geosynthetics. She is the author/co-author of more than 80 works in journals and conference proceedings. Her main research interests are in the field of pavements. Most of science research she focused on optimization and rationalization of pavement design and construction, as well as on pavement maintenance and management, facing the efforts to introduce into everyday use non-destructive methods (GPR, Falling Weight Deflectometer, FWD) of continuous evaluation of the pavement condition, its composition and layers thickness, which certainly represents a step forward from the current practice. Part of her professional work is devoted to environmental protection segment. She is a member of the International Geosynthetic Society (IGS), World Road Association (PIARC) American Society of Civil Engineers (ASCE), International Society for Asphalt Pavements (ISAP) as well as few Croatian professional associations and Committees.

Main experience in the Action's topics

- Applications of GPR in civil engineering especially in road applications.
- Evaluation of pavement structures using a combination of GPR with FWD measurement.

Recent publications on the Action's topics

- M. Ožbolt, T. Rukavina, J. Domitrović, "Comparison of the Pavement Layers Thickness Measured by Georadar and Conventional Methods – Examples from Croatia", Baltic Journal of Road and Bridge Engineering, 7, 2012, 1, p. 30-35.
- B. Kuvačić, M. Halle, T. Rukavina, "The structure management system on Croatian highways", XXIVth World Road Congress, Proceedings, Mexico City, 2011.
- M. Ožbolt, T. Rukavina, I. Stančerić, "Mogućnosti GPR uređaja pri snimanju kolničkih konstrukcija" (Possibilities of using GPR in the analysis of pavement structures), Građevinar, 3/2009, 61; p. 251-259.

Role in COST Action TU1208

- WG Member (WG2: Projects 2.1, 2.5; WG4: Project 4.3).

IVICA GULJAS
University of Osijek, Faculty of Civil Engineering, Osijek, Croatia
e-mail: nicolas.mourmeaux@uclouvain.be

Role in COST Action TU1208
WG Member (WG2: Project 2.1; WG4: Project 4.1).

DAMIR VAREVAC
University of Osijek, Faculty of Civil Engineering, Osijek, Croatia
e-mail: dvarevac@gfos.hr

Role in COST Action TU1208
WG Member (WG2: Project 2.2; WG4: Project 4.4).

Czech Republic

RADEK MATULA

Researcher on Div. of Transport Infrastructure and Env.
Centrum dopravniho vyzkumu, v.v.i. (Transport Research Centre)
Lisenska 33a, 63600 Brno, Czech Republic
Phone: +420 546 429 312 Fax: +420 548 423 712
e-mail: radek.matula@cdv.cz

Biographical sketch

He has been working for CDV since July 2007. He took part on solving of national projects: Multichannel GPR as a tool for monitoring of road and bridge structures, Design optimization and implementation of low-capacity road communications. He took part on solving of national project "Determination of temperature gradients in road pavements" which was solved as a part of European project COST 353: Winter Service Strategies for Increased European Road Safety. He cooperated on measurement of noise produced by different road pavements by SPB method and was involved in Marie Curie project TITaM (Transfer Infrastructure Technologies and Management), specifically in area of GPR diagnostics of concrete roads. He participated on solving of project ECRPD: "Energy Conservation in Road Pavement Design, Maintenance and Utilisation" and he cooperated in the European project DIRECT-MAT. He is member of Czech Society for Non-destructive testing (CNDT). Currently he studies (Ph.D. degree) at University of Pardubice (area GPR).

Main experience in the Action's topics

- Applications of GPR in civil engineering (focusing on pavements, bridges, etc.).
- Diagnostics of pavements (bearing capacity, visual inspections of roads).

Recent publications on the Action's topics

- Pospisil, K., Stryk, J., Matula, R. Capsules as a prevention of fibre clusters in concrete. *Ceramics – Silikáty 56/4*, 2013, str. 383-386, ISSN 1804-5847.
- Stryk, J., Matula, R. Georadar jako užitečný doplněk při diagnostice vozovek PK. (Ground penetrating radar as a useful supplement for pavement diagnostics). *In Asfaltové vozovky 2011 (Flexible pavements 2011),* České Budějovice, 22. -23. 11. 2011, [CD-ROM], 2011, 8 p., ISBN 978–80–903925–2–6.

Participation to other COST Actions

COST Action 353 'Winter Service Strategies for Increased European Road Safety."

Role in COST Action TU1208

MC Substitute Member. WG Member (WG2: Projects 2.1, 2.5; WG4: Project 4.3).

Czech Republic

JOSEF STRYK

Head of Infrastructure Department
Centrum dopravniho vyzkumu, v.v.i. (Transport Research Centre)
Lisenska 33a, 63600 Brno, Czech Republic
Phone: +420 724 016 729 Fax: +420 548 423 712
e-mail: josef.stryk@cdv.cz

Biographical sketch

Josef Stryk graduated at the Brno University of Technology, since 1999 he has been working for CDV. His current position is head of Infrastructure Dpt. in Infrastructure and environment Div. Specialization: non-destructive testing of roads and related materials and asset management systems (pavements, bridges). He took part on solving of national R&D projects: Optimization of technical parameters of road pavements; Rigid pavements - new technologies of construction, repair and reconstruction; Multichannel ground penetrating radar as a tool for monitoring of road and bridge structures. He participated on solving of COST actions No. 347, 354, TU 0702 and European FP projects SPENS, ARCHES, DIRECT-MAT. He has been on study visits in several research institutes – TRL (UK), BASt (Germany), LCPC (France). He is member of Czech Soc. for Non-destructive testing (CNDT), CEN TC 227 Road Pavements WG5 Surface characteristics, Czech Road Society (CSS).

Main experience in the Action's topics

- Applications of Ground Penetrating Radar in civil engineering.
- Diagnostics and maintenance of pavements (bearing capacity, surface characteristics, visual inspections). and asset management systems.

Recent publications on the Action's topics

- Stryk, J., Jurik, T. chapter 4.6.3 Overview of the Weather Information Service of the Czech Republic, book: Real-time Monitoring, Surveillance and Control of Road Networks under Adverse Weather Condition – Advances in Modeling and Weather-sensitive Traffic Management. Bron : Ifsttar, 2012, p. 226-233, ISBN 978-2-85782-699-6.
- Stryk, J., Pospisil, K. chapter 12.7: Diagnostic Methods for Concrete and Bridges by Acoustic Emission, book: Subsurface Sensing. 1th ed. Hoboken: John Wiley & Sons, 2011.

Participation to other COST Actions

COST Action 347 "Improvements in Pavement Research with Accelerated Load Testing"; 354 "Performance Indicators for Road Pavements"; TU0702 "Real-time Monitoring, Surveillance and Control of Road Networks under Adverse Weather Conditions".

Role in COST Action TU1208

MC Member. Leader of Project 2.1. WG Member (WG2: Projects 2.1, 2.5; WG4: Project 4.3).

VIT GREGOR
GF Instruments, LtD, Brno, Czech Republic
e-mail: info@gfinstruments.cz

JIRI NEDVED
Arcadis Geotechnika, Prague, Czech Republic
e-mail: diagnostika@inset.com

ROMAN SMOLIK
Inset, LtD, Prague, Czech Republic
e-mail: smolik.roman@atlas.cz

MICHAL VARAUS
Brno University of Technology, Brno, Czech Republic
e-mail: varaus.m@fce.vutbr.cz

LUDVIK VEBR
1.Czech Technical University in Prague, Prague Czech Republic
e-mail: vebr@fsv.cvut.cz

Role in COST Action TU1208
WG Associate Members (WG2).

Denmark

Jørgen Ringgaard

Electronic Engineer
Ramboll Denmark - Department of Geophysics and Geohydrology
Hannemanns Allé 53, DK-2300 Copenhagen S. Denmark
Phone: +45 5161 6807
e-mail: jri@ramboll.dk

Biographical sketch

Jørgen Ringgaard has been working with applications of most geophysical methods for 20 years. He holds an extensive experience with efficient data acquisition and application of GPR in different fields.

Main experience in the Action's topics

- Surveys with 2D GPR for mapping of utilities and geology
- Surveys with 3D GPR on roads, bridges, airports and in tunnels.

Recent publications on the Action's topics

Wisen R., Almholt A., Nielsen, U.T. and Ringaard J., Characterization of glacier ice with gpr and reflection seismic at mount isua, Greenland, Proceedings of EAGE Copenhagen 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG Member (WG2: Projects 2.1-2.5; WG4: Projects 4.1-4.6).

Denmark

ROGER WISÉN
Geophysicist
Technical manager
Ramboll Denmark - Department of Geophysics and Geohydrology
Hannemanns Allé 53, DK-2300 Copenhagen S. Denmark
Phone: +45 5161 6779
e-mail: rgw@ramboll.dk

Biographical sketch
Roger Wisén has a PhD in applied geophysics from Lund University 2005. Roger has previously participated in two EU funded Marie Curie research projects. The latest in year 2010 was on the topic joint inversion of seismic surface wave data and Radio Magneto-Telluric data was hosted by the Institute of Engineering Seismology and Earthquake Engineering in Thessaloniki. Roger has received EAGE's Ludger Mintrop award 2006 for best paper in EAGE's Near Surface geophysics Journal. With 15 years of work with geophysical investigations in commercial as well as academic projects, Roger Wisén has gathered a broad knowledge and solid experience in the field of geophysics. Roger is specialised in inverse modelling of geophysical data and the main interest is the application of near surface profiling techniques of all kinds, primarily in geotechnical investigations.

Main experience in the Action's topics
- Surveys with 2D GPR for mapping of utilities and geology
- Surveys with 3D GPR on roads, bridges, airports and in tunnels.

Recent publications on the Action's topics
Wisen R., Almholt A., Nielsen, U.T. and Ringaard J., Characterization of glacier ice with gpr and reflection seismic at mount isua, Greenland, Proceedings of EAGE Copenhagen 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Substitute Member. WG Member (WG2: Projects 2.1-2.5; WG4: Projects 4.1-4.6).

Egypt

MAGDY A. ATYA

Professor of Applied and Environmental Geophysics
Department of Gemagnetic and Geoelectric,
National Research Institute of Astronomy and Geophysics, 1 Mirsad Str., Beside Behman Hospital,
11722 Helwan, Cairo, Egypt
Phone.: +2 02 01149984001 Fax: +2 02 25548020
e-mail: magdy@hrgroup-eg.com

Biographical sketch

Magdy A. Atya received the B.Sc. degree of Honor in Geophysics from Mansoura University in 1987. In 1989 employed as research assistant at NRIAG. In 1992 promoted the M.Sc. from at the Cairo University. In 1998, he has been promoted the PhD on "Geology and Geophysics in Archeology, an application of the ground penetrating radar GPR" from Berne University, Switzerland. From 2000 to 2002, he worked as post doc. in the Tokyo Inst. of Technology TIT. On the level of international collaboration, in 1990, he participated in the IFAO "Institute Francies d' Archaelogie Orientale" to prospect for the first pylon of Ramsseium II, in 1992 , participated in the Discovery of Cemetry of 2nd World War Offers, and in 1994 to prospect for the Iland of Pharaos in Alexandria's subsea. Magdy Atya has executed more than 20 research projects, participated as auther/co-author in about 200 papers, books, reports, and artcles. Magdy was researcher at NRIAG from 1998 to 2004, associate professor 2004 to 2010, and full professor from 2010 to now. He acted as general coordinator for the Egypt Japan arch. mission to the New Valley, and now for the Egypt Russia agreement.

Main experience in the Action's topics

- Development of Antinna and GPR devices in cooperation with ERI.
- Geotechnical assistements, road constructions, desert safe passes, bridges,
- Archaeological prospections, inspecting the inner deformation and fissures in the monuments, and observing the former restorations processes.
- Landmine detections and robotic utilization, utility pipes and infrastructure.

Recent publications on the Action's topics

Atya M. A., et al. "GPR Investigations to allocate The Archaeological Remains in Mut Temple, Luxor, Upper Egypt. NRIAG, 2013.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Observer from NNC. WG Member (WG2: Projects 2.1, 2.3, 2.5; WG4: Projects 4.1, 4.6).

Estonia

HANNES TÕNISSON

Senior researcher, coastal research group
Institute of Ecology, Tallinn University
Uus-Sadama 5, Tallinn, 10120, Estonia
Phone: +37256564129
e-mail: Hannes.Tonisson@tlu.ee

Biographical sketch

Hannes Tõnisson received a PhD in ecology (coastal geology) from Tallinn University in 2008. His first steps with GPR were made just after his PhD studies in 2008. He was using GPR to describe internal structure of the beach formations and estimate the thickness of various sediment layers. He used GPR on lakes, to describe initial bottom topography of small lakes, evaluate the volume of lake sediments and plan coring sites for paleogeographical investigations. He also used GPR on the peat bogs to estimate the volume of peat. He is currently trying to reconstruct the history of the storminess in the Baltic Sea region by studding internal architecture of ancient beach formations. Some of his studies are also related to archaeology. Small part of his work is related to the dissemination of GPR technology. He is giving invited lectures and practical field-lessons at elementary schools, at his university and in various courses/summer schools.

Main experience in the Action's topics

- Applications of GPR in archaeology, ecology, geology, coastal research, environmental studies and civil engineering. Surveys with GPR for mapping of utilities.
- Image processing.
- Disseminating GPR technology for various interests groups.

Recent publications on the Action's topics

- Anderson, A.; Vilumaa, K.; Tõnisson, H.; Kont, A.; Ratas, U.; and Suuroja, S. 2014. Geomorphology of coastal formations on present and ancient sandy coasts. Journal of Coastal Research, SI70, 90 - 95.
- Vilumaa, K.; Tõnisson, H.; Kont, A.; and Ratas, U. 2013. Ground-penetrating radar studies along the coast of Estonia. Journal of Coastal Research, SI65, 612 - 617.
- Vilumaa, K., Kont, A., Ratas, U., and Tõnisson, H. 2012. Ground-penetrating radar study of coastal landscape on Hiiumaa Island, Estonia. In: IEEE/OES Baltic 2012 International Symposium: May 8-11, 2012, Klaipeda, Lithuania, Proceedings: IEEE, 2012, 1 - 6.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG Member (WG2: Projects 2.1, 2.2, 2.3; WG4: Projects 4.1, 4.3, 4.4).

Estonia

KADRI VILUMAA
Researcher in Institute of Ecology
Tallinn University - coastal research group
Uus-Sadama 5, Tallinn, 10120 Estonia
Phone: +372 6199817
e-mail: kadri.vilumaa@tlu.ee

Biographical sketch
Kadri Vilumaa is a PhD student in Ecology at Tallinn University. Her first contacts with GPR are since 2010 when she started her thesis "The influence of different environmental factors on coastal dune landscape development: case studies from Estonia". She has used GPR data to generate high-resolution images of the internal architecture of old beach ridge systems and associated depressions to define the boundaries between peat and mineral sediment. The main purpose of the GPR work is to determine the thickness of peat and sand layers, the depth of water-resistant clay horizon, the peat covered ridges and to analyze the slope grade of sand layers.

Main experience in the Action's topics
Applications of Ground Penetrating Radar in archaeology, ecology, geology, coastal research and environmental studies.

Recent publications on the Action's topics

- Anderson, A.; Vilumaa, K.; Tõnisson, H.; Kont, A.; Ratas, U.; and Suuroja, S. 2014. Geomorphology of coastal formations on present and ancient sandy coasts. Journal of Coastal Research, SI70, 90 - 95.
- Vilumaa, K.; Tõnisson, H.; Kont, A.; and Ratas, U. 2013. Ground-penetrating radar studies along the coast of Estonia. Journal of Coastal Research, SI65, 612 - 617.
- Vilumaa, K., Kont, A., Ratas, U., and Tõnisson, H. 2012. Ground-penetrating radar study of coastal landscape on Hiiumaa Island, Estonia. In: IEEE/OES Baltic 2012 International Symposium: May 8-11, 2012, Klaipeda, Lithuania, Proceedings: IEEE, 2012, 1 - 6.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (WG2: Projects 2.1, 2.2, 2.3; WG4: Projects 4.1, 4.3, 4.4).

Finland

TAIJA HUOTARI-HALKOSAARI
Geophysicist
Geological Survey of Finland (GTK)
P.O Box 96, FI-02151 Espoo, Finland
Phone: +358 29 503 2125
e-mail: taija.huotari-halkosaari@gtk.fi

Biographical sketch and Main experience in the Action's topics
Taija Huotari-Halkosaari received her MSc (Tech.) in Applied Geophysics from Helsinki University of Technology, Finland, in 2002. She has been working as a geophysicist in Geological Survey of Finland since 2003. Her main interest is in environmental geophysics and geophysics at the urban areas. She is specialized in Electrical Resistivity Tomography (ERT). The environmental geophysics projects have been focused on tailings impoundment studies, dam leakage/seepage studies, studies of contaminated sites and groundwater studies. The latest project of geophysics at the urban areas focused on integration of geological and geophysical data in fracture and fissure studies of bedrock. She is a member of European Association of Geoscientists & Engineers (EAGE), Society of Explorations Geophysicists (SEG) and Geophysical Society of Finland.

Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Substitute Member. WG Associate Member (WG2; WG4).

PEKKA HANNINEN
Geological Survey of Finland, Espoo, Finland
e-mail: pekka.hanninen@gtk.fi

Role in COST Action TU1208
MC Member. WG Member (WG2: Projects 2.1-2.5; WG4: Projects 4.1-4.6).

Finland

TERHI PELLINEN
Researcher in Highway Engineering
Aalto University - Department of Civil and Environmental Eng.
P.O.Box 12100, FI-00076 Espoo, Finland
Phone: +358 50 555 3790
e-mail: terhi.pellinen@aalto.fi

Biographical sketch
Prof. Terhi Pellinen received her MSc in *Civil Engineering* from Oulu University, Finland, and PhD in *Civil Engineering* from Arizona State University, USA. She worked for asphalt industry at various researcher positions for eleven years in Finland and in the USA before engaging in academia. Currently she is a Professor of Highway Engineering at Aalto University. She is the author/co-author of more than 110 publications of books, international journals and conference proceedings. She is member of Editorial Board for the T&F Journal "Road Materials and Pavement Design", and a quest reviewer among others for "RILEM Materials and Structures", "International Journal of Pavement Engineering", ASCE and ASTM material's journals. Her main research interests are in characterization of bituminous materials, road pavement design, maintenance and rehabilitation.

Main experience in the Action's topics
Application of ultra sound measuring techniques in pavement engineering.

Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (WG2: Projects 2.1, 2.4). WG Associate Member (WG1).

France

JEAN-PAUL BALAYSSAC
Professor
Laboratoire Matériaux et Durabilité des Constructions
LMDC, Université de Toulouse 135 avenue de Rangueil
31077 Toulose Cedex 04 France
Phone: +33 5 67 04 88 79 Fax. +33 5 61 55 99 49
e-mail: jean-paul.balayssac@insa-toulouse.fr

Biographical sketch
Jean-Paul Balayssac is a Professor at the Technology Institute of Paul Sabatier University, Toulouse, France. He is a member of RILEM since 1995, he was involved in two technical committees and at this time he is the secretary of RILEM TC 247 ISC (non destructive assessment of concrete structures) and he was the coordinator of different French projects in the field of nondestructive testing. He is author of more than 60 papers in international journals, conferences and books. He organised the "diagnobeton conference" NDT of concrete structures in Toulouse in March 2014. His research topics include non destructive testing of concrete structures, durability of cover concrete and durability of thin bonded cement-based overlays. Main research interests are in the application of electrical and EM methods for moisture and chloride evaluation in concrete. He is also interested by reinforcement corrosion and by the assessment of masonries.

Main experience in the Action's topics
- Application of GPR to moisture assessment in concrete structures.
- Application of GPR for the localisation of reinforcement or voids inside concrete and masonry structures.
- Combination of GPR with other non destructive methods.

Recent publications on the Action's topics
- Non-destructive evaluation of concrete physical condition using radar and artificial neural networks, Z.M. Sbartaï, S. Laurens, K. Viriyametanont, J.P. Balayssac, G. Arliguie, Construction and Building Materials, Volume 23, Issue 2, February 2009, Pages 837-845.
- Evaluation of the concrete electromagnetic properties by using radar measurements in a context of building sustainability, X. Ferrieres, G. Klysz, P. Mazet, J.P. Balayssac, Computer Physics Communications, Volume 180, Issue 8, Août 2009, Pages 1277-128.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (WG2: Project 2.4; WG4: Projects 4.2, 4.3).

France

MAKSIM BANO
Associate Professor
EOST, STRASBOURG UNIVERSITY
5 Rue René Descartes, 6084 Strasbourg, France
Phone: +33 (0)3 68850080 Fax: +33 (0)3 68850125
e-mail: maksim.bano@unistra.fr

Biographical sketch
Maksim Bano received the Master Degree in Physics (1980). Master Degree in Geophysics (1985) and the Doctorate in Applied Geophysics (1989) from Louis Pasteur University of Strasbourg, France. He is a member of European Association of Geoscientists & Engineers (E.A.G.E.) since 1996, Society of Exploration Geophysicists (S.E.G.) since 1998 and is a Associated Editor of 'Geophysics' journal since 2004. He is the main supervisor of four PhD's thesis and eight projects of Master degrees since 2000.

Main experience in the Action's topics
- Development of full-wave methods for the solution of electromagnetic forward problems by FDTD in two and three-dimensional structures.
- GPR measurements in a Controlled Vadose Zone: influence of the water content.
- Numerical imaging techniques for localization of buried structures from GPR data.
- Studing the influence of grain size, shape and compaction on GPR electromagnetic waves.
- GPR response and FDTD modeling to fuel infiltration in a sand box experiment.

Recent publications on the Action's topics
- C. Ç. Yalciner, M. Bano, S. Kadioglu, V. Karabacak, M. Meghraoui, E. Altunel, "New temple discovery at the Archaeological Site of Nysa (Western Turkey) using GPR method," Journal of Archaeological Science, Vol. 36, pp. 1680–1689, 2009.
- V. G. Nguyen, D. N. Tang, M. Bano, "Groundwater investigation on sand dunes area in southern part of Vietnam by Magnetic Resonance Sounding," Acta Geophysica, Vol. 60(1), 2009, doi:10.2478/s11600-011-0040-2.
- C. Ç. Yalçiner, E. Altunel, M. Bano, M. Meghraoui, V. Karabacak, H. Serdar, "Application of GPR to normal faults in the Büyük Menderes Graben, Western Turkey," Journal of Geodynamics, 2012, doi: 10.1016/j.jog.2012.05.011.

Participation to other COST Actions
COST Action TU1206 "SUB-URBAN - A European network to improve understanding and use of the ground beneath our cities" (MC Substitute Member).

Role in COST Action TU1208
WG Member (WG2: Projects 2.2, 2.3; WG3: Projects 3.1, 3.2).

France

CHRISTOPHE BOURLIER

Researcher in Electromagnetics
IETR Laboratory LUNAM University, University of Nantes, Polytech Nantes
Rue Christian Pauc, La Chantrerie, BP 50609
44306 Nantes Cedex 3, France
e-mail: christophe.bourlier@univ-nantes.fr

Biographical sketch

Dr Christophe Bourlier received the M. S. degree in Electronics from the University of Rennes (France), in 1995. While at the University of Rennes, he was with the Laboratory of Radiocommunication where he worked on antennas coupling in the VHF-HF band. He received the Ph.D. degree in 1999 from the SEI (Système Electronique et Informatique) Laboratory, University of Nantes. Now, he is with the IETR Laboratory (Institute of Electronics and of Telecommunications of Rennes, France) in the Remote Sensing team at polytech Nantes (University of Nantes, France). He works as a Researcher of National Center for Scientific Research (CNRS) on electromagnetic wave scattering from rough surfaces and objects for remote sensing applications, radar signatures and for road survey by GPR at nadir. He is author of more than 160 journal articles and conference papers

Main experience in the Action's topics

- Development of full-wave and asymptotic methods for the solution of electromagnetic wave scattering from rough surfaces, rough layer and objects near a rough surface.
- Development of asymptotic methods based on the physical optics approximation for the scattering from electrically large objects.

Recent publications on the Action's topics

- C. Bourlier, N. Pinel and G. Kubické, Method of moments for 2D scattering problems. Basic concepts ans applications, FOCUS SERIES in WAVES, Ed. WILEY-ISTE, 2013, ISBN 978-1-84821-472-9, 148 pages, 2013.
- N. Pinel and C. Bourlier, Electromagnetic Wave Scattering from Random Rough Surfaces: Asymptotic Models, FOCUS SERIES in WAVES, Ed. WILEY-ISTE, 2013, ISBN 978-1-84821-471-2,160 pages, 2013.
- C. Bourlier, G. Kubické and N. Pinel, PILE method combined with PO for the scattering by coated cylinders, a rough layer and an object below a rough surface", J. Opt. Soc. Am. A, vol. 30, no. 9, pp. 1727-1737, 2013.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (Project 3.1).

XAVIER DÉROBERT
Senior researcher in Assessment and Imaging Laboratory
Ifsttar – Geotechnical Engineering, Environment, Natural Hazards and Earth Sciences Department
Route de Bouaye, CS 4 - 44344 Bouguenais cedex, France
Phone +33 2 40845911 - Fax: +33 2 40845997
e-mail: xavier.derobert@ifsttar.fr

Biographical sketch
Dr Xavier Dérobert has become state engineer in civil engineering in 1987, received a PhD in electromagnetism in 1995 at Lille university and got his habilitation to supervise PhD theses in 2003 at Nantes university. He joined the Laboratoire Central des Ponts et Chaussees (LCPC transformed in Ifsttar in 2011) in Nantes, France, in 1987 as a research scientist. He has organized two national workshops on Ground Penetrating Radar in 2001 and 2003, co-organized the NDT-CE international congress in 2009 in Nantes and the IWAGPR workshop in 2013 in Nantes. He is currently the head of the "Assessment and imaging" laboratory, working in the development of methodologies using radar techniques on civil infrastructures and subsurface geophysics. He has published over 60 journal papers and international communications on these subjects.

Main experience in the Action's topics
- Applications of GPR in civil engineering.
- Research on material properties and structure reconstruction by GPR.

Recent publications on the Action's topics
- Chataigner S., Saussol J.L., Dérobert X., Villain G. (2014), "Temperature influence on electromagnetic measurements of concrete moisture", Euro. Journ. of Env & Civil Eng.
- du Plooy R., Villain G., Palma-Lopes S., Ihamouten A., Dérobert X., Thauvin B. (2013), "Electromagnetic non-destructive evaluation techniques for the monitoring of water and chloride ingress into concrete: a comparative study", Mat & Struct.
- Villain G., Sbartaï Z.M., Dérobert X., Garnier V., Balayssac J.P. (2012), "Durability diagnosis of a concrete structure in tidal zone by combining NDT methods: laboratory tests and case study", Journ. Const. & Build. Mat., Vol. 37, pp. 893-903.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC member. WG2 Vice-Chair. Leader of Project 2.3. WG Member (WG2: Projects 2.1-2.5; WG4: Project 4.3). Local Organiser 2014 WG Progress Meeting.

France

JEAN DUMOULIN
Senior researcher.
IFSTTAR - COSYS - SII (Structures and Integr. Instr. Lab.)
Route de Bouaye, CS4, 44344 Bouguenais Cedex, France
Phone: + 33 (0)2 4084 56 24 - Fax: + 33 (0)2 4084 59 98
e-mail: jean.dumoulin@ifsttar.fr

Biographical sketch
Jean Dumoulin joined IFSTTAR in 1997. He is the author/co-author of more than 80 works on books, journals and conference proceedings; and more than 50 research reports in EU projects or Industrial projects. In 2012 he was appointed as Associate Professor at Université Laval in Québec City (Canada). His main research interests are in Infrared thermography (passive and active), heat transfer and monitoring by imaging techniques. He contributed to the European projects NR2C (FP6) and ISTIMES (FP7). In ISTIMES, he also led the workpackage "Sensing Techniques". He is member of the French Thermal Society (SFT) since 1994. He is also member of the EGU since 2010. In 2013, he was appointed as EGU science officer in the Division on Geosciences Instrumentation and Data Systems (GI) for the thematic "Infrastructures instrumentation and monitoring"

Main experience in the Action's topics
- NDT methods for non emergent defect detection by active infrared thermography.
- Thermal modelling, inverse methods and image processing for the localization and characterisation of buried structures from infrared thermography data.
- Applications of IR thermography in Civil Engineering.

Recent publications on the Action's topics
- L. Alperovich, L. Eppelbaum, V. Zheludev, J. Dumoulin, F. Soldovieri, M. Proto, M. Bavusi and A. Loperte, "A new combined wavelet methodology: implementation to GPR and ERT data obtained in the Montagnole experiment", J. of Geoph. Eng., 10(2), 17, 2013
- J-P. Monchau, M. Marchetti, L. Ibos, J. Dumoulin, V. Feuillet and Y. Candau, "Infrared Emissivity Measurements of Building and Civil Engineering Materials: A new device for measuring emissivity", Intl. J. of Thermophysics, doi : 10.1007/s10765-013-1442-y, 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Associate Member (WG4).

France

KHALIL EL KHAMLICHI DRISSI
Full Professor
Institut PASCAL, CNRS, UMR6602
Blaise Pascal University
24 avenue des Landais, 63177 AUBIERE
Phone: +33 (0)4 73407326 Fax: +33 (0)4 73407340
e-mail: drissi@univ-bpclermont.fr

Biographical sketch

Khalil El Khamlichi Drissi received the Diploma Engineer, MSc, and PhD degrees in Electrical Engineering from Ecole Centrale de Lille and the University of Lille, in 1987 and 1990 respectively. He received the Habilitation in electronics, the highest qualification in France; at the Doctoral School "Sciences Pour l'Ingénieur" of Blaise Pascal University, in 2001. Pr. Khalil El Khamlichi Drissi became Vice President of Research Valorisation, UBP chancellor board in April 2012. Currently, he is Full Professor at the Department of Electrical Engineering where he was the dean in the period from 2007 to 2011. He is also senior researcher at Institute Pascal. He authored or coauthored more than 100 scientific papers published in peer-review journals and presented at international conferences. He is a member of IEEE and EEA and has been chairperson and member of scientific committees at international conferences. He is project leader and responsible for several international projects related to EMC and a partner within the Brain City Research Inst.

Main experience in the Action's topics

- Modeling of full-wave methods for the solution of electromagnetic problems by using Transmission Lines Methods in Frequency Domain and Time Domain.
- Automatic Target classification based on radar backscattered UWB signals.

Recent publications on the Action's topics

- M. Khodjet-Kesba, K. Chahine, K. El Khamlichi Drissi and K. Kerroum, "Comparison of Ultra-wideband Radar Target Classification Methods Based on Complex Natural Resonances", PIER Symposium, 27-30 March, 2012, Kuala-Lumpur, Malaysia, pp. 306-309.
- M. Khodjet-Kesba, K. El Khamlichi Drissi C. Faure and K. Kerroum, "Cross Validation Technique Selection of Features Extraction Methods for UWB Radar Target Classification", PIER Symposium, 19-23 August, 2012, Moscow, Russia, pp. 306-309.

Participation to other COST Actions

COST Action BM1309 "European network for innovative uses of EMFs in biomedical applications" (WG Member).

Role in COST Action TU1208

WG Member (WG3: Projects 3.1, 3.2).

France

CHRISTELLE EYRAUD
Assistant Professor in Electromagnetics
Aix-Marseille University/CNRS/Ecole Centrale Marseille Institut Fresnel
Campus Universitaire de Saint-Jérôme
Avenue Escadrille Normandie-Niemen, 13397 Marseille Cedex, France
Phone.: +33 (0)4 91288085 - Fax: +33 (0)4 91288067
e-mail: christelle.eyraud@fresnel.fr

Biographical sketch

C. Eyraud's research activities are related to the experimental and numerical study of scattering phenomena in the microwave domain in order to characterize targets in a non destructive way. During her PhD which she received in 2006 at Aix-Marseille University, she has worked at Institut Fresnel on the improvement of scattered field measurements of weakly scattering 3D targets. This work involved the correction of various experimental errors as well as the characterization of the residual random noise. She has taken part in a collaboration with the INTEC group-Ghent university, supported by two ''Projet d'Action Intégré'', which concerned the detection and the localization of bars in concrete. During her post-doctoral period from 2007 to 2008 in the Laboratoire de Planétologie de Grenoble under the supervision of W. Kofman, she has developed a 3D inversion algorithm which fully takes into account the measurement uncertainties. Since September 2008, she has been appointed Assistant Professor at Institut Fresnel. She has more than 15 peer review papers in international journals and is a reviewer for international journals.

Main experience in the Action's topics

- Design/optimisation of subsurface imaging multistatic configurations.
- Development of calibration procedures and of post-treatments methods.
- Development of antenna radiation pattern model for forward scattering solvers.
- Incorporation of measurement uncertainties in imaging procedures.

Recent publications on the Action's topics

- S. Nounouh, C. Eyraud, H. Tortel, A. Litman "Modeling of the antenna effects and calibration for subsurface probing", Microwave and Optical Technology Letters, 56(11) : 2516-2522, 2014
- S. Nounouh, C. Eyraud, A. Litman, H. Tortel, "Near-subsurface imaging in an absorbing, embedding medium with a multistatic/single frequency scanner", NSG 2014.

Participation to other COST Actions

No.

Role in COST Action TU1208

- WG Member (WG1: Projects 1.1, 1.2; WG3: Projects 3.3, 3.4).

France

AMINE IHAMOUTEN

Researcher - Centre for Studies and Expertise on Risks, Environment, Mobility, and Urban and Country planning (Cerema) - 23 avenue de l'Amiral Chauvin - BP 20069 - 49136 Les Ponts-de-Cé cedex (Angers site) France
Phone: +33 02 41 79 13 28
e-mail: amine.ihamouten@cerema.fr

Biographical sketch

Dr. Ihamouten Amine, holds a Ph.D. degree in civil engineering, electrical and electronics engineering in 2011 from Nantes University and IFSTTAR, Nantes, France. He is currently a researcher with the Cerema (Centre for expertise and engineering on risks, environment, mobility, urban and country planning), Angers, France. His research interests include the characterization of civil engineering and old building materials using non destructive techniques. These researches focus on the study of civil engineering structure durability and old building degradations with a physical correlation between electromagnetic non-destructive methods and degradation mechanisms. He has organized national and international workshops on GPR in Nantes, France. He has published over 20 journal papers and international communications. He is an Associate Editor for the Near Surface Geophysics Journal.

Main experience in the Action's topics

- Implementation of in situ and in-lab SFR and GPR measurements for the assessment of civil engineering structures (i.e. concrete bridges) and old buildings (i.e. Tuffeau castles),
- Electromagnetic full-wave inversion for the physical and the hydrical mapping of old buildings: Step Frequency Radar vs. Tuffeau walls,
- EM waveguide propagation for the study of concrete structure durability: water, chloride and carbonation ingresses,

Recent publications on the Action's topics

- G. Villain, A. Ihamouten, R. du Plooy, S. Palma Lopes and X. Dérobert, "Use of electromagnetic non-destructive techniques for monitoring water and chloride ingress into concrete", Near Surface Geoph., in press, 2014.
- M. Sun, N. Pinel, C.Le Bastard, V. Baltazart, A. Ihamouten and Y. Wang, "Effect of antenna-medium coupling in the analysis of ground-penetrating radar data", NSG 2014.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG2: Projects 2.2, 2.4-2.5). WG Associate (WG3, WG4).

France

MARC LAMBERT
Chargé de recherche CNRS
Départ. de Recherche en Electrom. - Laboratoire des Signaux et Systèmes
(L2S UMR8506 CNRS-SUPELEC-Univ. Paris Sud 11)
3, rue Joliot-Curie, 91192 Gif-sur-Yvette cedex - France
Phone +33 (0)1 69 85 15 65 Fax +33 (0)1 69 85 17 65
e-mail: marc.Lambert@lss.supelec.fr

Biographical sketch
Docteur en Sciences (January 1994) and Habilitation à Diriger des Recherches (December 2001), Université Paris-Sud 11. He spent one year as post-doc at BRGM (Bureau de recherches géologiques et minières) working on 3D imaging for geophysical applications. He became Junior Scientist (Chargé de recherche) at Centre National de la Recherche Scientifique (CNRS), Oct. 1995. He is with Laboratoire des Signaux et Systèmes (L2S), joint CNRS, SUPELEC, and Université Paris-Sud laboratory, Gif-sur-Yvette and he the head of its Département de Recherche en Electromagnétisme. Since 2006 he shares the leadership of the "groupe de travail "Imagerie & inversion"" of the Groupement de Recherche CNRS "GDR ONDES", a large network of French laboratories and scientists in science of waves (electromagnetics, acoustics, photonics) —present-day GDR & past/present/ achievements are at http://grd-ondes.u-bourgogne.fr

Main experience in the Action's topics
- An extensive knowledge about the scattering wave inverse problem and the related direct problem in 2D and 3D seen from the mathematical theory to the numerical solution with a strong interest in both theoretical and applied aspects

Recent publications on the Action's topics
- M. Benedetti, D. Lesselier, M. Lambert, A. Massa, Multiple-shape reconstruction by means of multiregion level sets, IEEE Trans. Geosci. Remote Sensing 48 2330-2342 (2010)
- S. Bilicz, M. Lambert et S. Gyimothy, Kriging-based generation of optimal databases as forward and inverse surrogate models, Inverse Prob 26 7 074012 (15pp) (2010)
- S. Bilicz, E. Vazquez, M. Lambert, S. Gyimothy et J. Pavo, Characterization of a 3D defect using the Expected Improvement algorithm, COMPEL 28 4 p. 851–864 (2009)

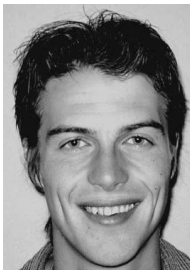
Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Projects 3.1, 3.2).

France

CÉDRIC LE BASTARD

Researcher in Signal Processing and Electromagnetics
CEREMA, DTer Ouest
23, avenue de l'amiral Chauvin, BP 69,
49136, Les ponts de Cé, France
Phone: +33 241 791 305
e-mail : cedric.lebastard@cerema.fr



Biographical sketch

Dr. Cedric Le Bastard received the B.S. and M.S. degrees in electronic engineering from the University of Rennes, Rennes, France, in 2001 and 2003, respectively, and the Ph.D. degree Signal Processing and Electronics from the IFSTTAR (French institute of science and technology for transport, development and networks) and the University of Nantes, Nantes, France, in 2007. He is a researcher with the Cerema (Centre for expertise and engineering on risks, environment, mobility, urban and country planning). His research interests include GPR for civil engineering applications, electromagnetic wave scattering, array processing, spectral analysis, radar signatures and time delay estimation. He is also a researcher associated to IETR (Institute of Electronics and of Telecommunications of Rennes, France) in the Remote Sensing team at polytech Nantes (University of Nantes, France)

Main experience in the Action's topics

- Development of signal processing methods to estimate time delay (Thin-Pavement Thickness), permittivity and roughness using GPR.
- Development of signal-processing methods to detect & characterize cracks and debonding.
- Applications of Ground Penetrating Radar in civil engineering.

Recent publications on the Action's topics

- M. Sun, C. Le Bastard, N. Pinel and Y. Wang, "Estimation of Time Delay and Roughness Parameters by GPR using ESPRIT method", IEEE IGARSS Conf., Québec, Canada, July, 2014
- C. Le Bastard, Y. Wang, V. Baltazart and X. Dérobert, "Time Delay and Permittivity Estimation by Ground Penetrating Radar with Support Vector Regression", IEEE Geoscience and Remote Sensing Letters, Vol. 11, No. 4, pp. 873-877, April 2014.
- M. Sun, N. Pinel, C. Le Bastard, V. Baltazart, A. Ihamouten and Y. Wang, "Time delay and surface roughness estimation by subspace algorithms for pavement survey by radar", 7th IWAGPR workshop, Nantes, July, 2013.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG3: Project 3.2).

France

DOMINIQUE LESSELIER
Directeur de recherche CNRS - Départ. de Recherche en Electr.- Laboratoire des Signaux et Systèmes
L2S UMR8506 CNRS-SUPELEC-Univ. Paris Sud 11
3, rue Joliot-Curie, 91192 Gif-sur-Yvette cedex - France
Phone +33 (0)1 69 85 15 61 - Fax +33 (0)1 69 85 17 65
e-mail: lesselier@lss.supelec.fr

Biographical sketch

He is with Laboratoire des Signaux et Systèmes (L2S), joint CNRS, SUPELEC, and Université Paris-Sud laboratory, Gif-sur-Yvette (its Département de Recherche en Electromagnétisme). Jan. 2006-Dec. 2009, he was Director of the Groupement de Recherche CNRS "GDR ONDES", a large network of French laboratories and scientists in science of waves. He received the R. W. P. King Award, Oct. 1982, from IEEE Ant. and Prop. Soc. Fellow of Institute of Physics (elected, 1999) and Fellow of Electr. Academy, Senior Member of SEE and of IEEE, he is active in International Union of Radio Science, Comm. B. Since 2003, per renewed terms of 3 years, he is Ass. Editor of Radio Science (AGU). Since 2005, he sits on the International Advisory Panel of Inverse Problems (IOP Publishing). He is also on the PIER Journals Editorial Board since 2000. Since 1998, he is also on the Standing Committee of the Electrom. Non-Destr. Evaluation Workshop Series & Intl. Steering Committee of the Intl. Symposia on App. Electromagnetics and Mechanics.

Main experience in the Action's topics

- Electromagnetic and elastic wave-field inverse problems and imaging, from mathematical theory to numerical solutions to pertinent applications, and viceversa.
- Low/very-low/ frequency part of Earth's underground probing.

Recent publications on the Action's topics

- O. Dorn and D. Lesselier, Level set methods for structural inversion and image reconstruction, 10 385-444, Handbook of Mathematical Methods in Imaging, O. Scherzer ed., Springer, Berlin (2011).
- S. Gdoura, A. Wahab, D. Lesselier, Electromagnetic time reversal and scattering by a small dielectric inclusion, 386, 012010, J. Phys.: Conf. Series (New Computational Methods for Inverse Problems), L. Blanc-Féraud and P.-Y. Joubert eds, IOP Science, London (2012).

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG3: Projects 3.1-3.4).

France

AMELIE LITMAN
Assistant Professor in Electromagnetics
Aix-Marseille University/CNRS/Ecole Centrale Marseille
Institut Fresnel Campus Universitaire de Saint-Jérôme
Avenue Escadrille Normandie-Niemen, 13397 Marseille
Cedex, France, Phone.: +33 (0)4 91288004 - Fax: +33
(0)4 91288067, e-mail: amelie.litman@fresnel.fr

Biographical sketch
Since 1994, A. Litman's research activities are related to inverse problems and in particular to the development of inverse scattering algorithms. This activity was initiated by a PhD thesis in Applied Mathematics (1994-1997) performed under the supervision of D. Lesselier at Laboratoire des Signaux et Systèmes. Her postdoctoral training period performed in the Netherlands in 1997-1998 under the supervision of Prof. A.G. Tijhuis, was an opportunity to study more deeply nonlinear optimization algorithms. She has then joined Schlumberger from 1998 to 2002. Since November 2002, she has been appointed Assistant Professor at Institut Fresnel, at the University of Aix-Marseille. She was the coordinator for one project, funded by the French ANR (ANR Jeunes Chercheurs JCJC-0019) which concerned the development of microwave imaging systems for monitoring soil water content. She is the team leader of the HIPE team at Institut Fresnel since Sept 2008. She has been involved in several international collaborative projects which has led to several co-authored publications.She has more than 25 peer review papers in international journals or book chapters, she was the coeditor of one special section in Inverse Problems in 2009. She is an active reviewer for several international journals.

Main experience in the Action's topics
Development of numerical schemes for 2D/3D EM forward-scattering problems including in particular antennas and complex structures, Inverse scattering approaches using complete and/or aspect-limited data for qualitative and quantitative characterization.

Recent publications on the Action's topics

- S. Nounouh, C. Eyraud, H. Tortel, A. Litman "Modeling of the antenna effects and calibration for subsurface probing", MOTL, 56(11) : 2516-2522, 2014.
- C. Eyraud, A. Litman, H. Tortel, "Near-subsurface imaging in an absorbing, embedding medium with a multistatic/single frequency scanner", Near Surface Geophysics, 2014.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.2).

France

NICOLAS PINEL
R&D engineer in Electromagnetics
Alyotech Technologies
Technoparc de l'Aubinière, 2 impasse des Jades, 44388
Nantes Cedex 3, France
Phone.: +33 251 896 452 - Fax: +33 251 896 455
e-mail: nicolas.pinel@gmail.com

Biographical sketch

Nicolas Pinel received the Engineering degree and M.S. degree in Electronics and Electrical Engineering both from Polytech Nantes, France, and the Ph.D. degree from the University of Nantes, France, in 2006. He worked as a research Engineer in IETR Laboratory (Institut d'Electronique et de Télécommunications de Rennes), Nantes, France, and joined Alyotech Technologies in 2013. He works on asymptotic methods of electromagnetic wave scattering from random rough surfaces and layers. He is the author/co-authors of about 60 publications in international books, journals and conference proceedings. He is a member of the Institute of Electrical and Electronics Engineers (IEEE), IEEE Antennas and Propagation - Geoscience and Remote Sensing Societies, group of research on waves ("GdR Ondes") from the French National Centre for Scientific Research (CNRS), commission F (radiowave propagation and remote sensing) of URSI France.

Main experience in the Action's topics

- Development of rigorous and asymtpotic methods for the solution of electromagnetic forward-scattering problems by two-dimensional and three-dimensional layered media.
- Development of numerical techniques for the estimation of pavement thickness.
- Applications of Ground Penetrating Radar in civil engineering.

Recent publications on the Action's topics

- M. Sun, N. Pinel , C. Le Bastard, V. Baltazart, A. Ihamouten, Y. Wang , "Time delay and surface roughness estimation by subspace algorithms for pavement survey by radar" , in IWAGPR, Nantes, France, Jul. 2013
- N. Pinel, C. Bourlier, "Electromagnetic Wave Scattering from Random Rough Surfaces – Asymptotic models", ISTE Publishing, Wiley, Oct. 2013
- C. Bourlier, N. Pinel, G. Kubické, "Method of Moments for 2D Scattering Problems – Basic Concepts and Applications", ISTE Publishing, Wiley, Jul. 2013.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG3: Project 3.1; WG2: Project 2.1).

France

ALBANE SAINTENOY

Maître de conférence
Université Paris Sud, IDES UMR 8148
Département des Sciences de la Terre Bâtiment 504
4ème étage 91405 Orsay Cedex France
Phone: +33 01 69 15 67 98
Albane.Saintenoy@u-psud.fr

Biographical sketch
2000 Maître de conférence, (section 35); Interaction et Dynamique des Environnements de Surface (IDES), Université Paris Sud.1998-2000 : Post-doc, Center for Wave Phenomena, Colorado School of Mines.1998 : Ph.d in Geophysics, Institut Physique du Globe de Paris; title: Radar géologique : Acquisition de données multi-déports pour une mesure multi paramètres; Advisor: A. Tarantola.

Main experience in the Action's topics
- Aquisition, processing and interpretation of GPR data. Arctic glacier investigation, archeological survey, and cavity detection.
- Space and time monitoring of shallow subsurface processes, in order to infer information about physical parameters.

Recent publications on the Action's topics
- J.-M. Friedt, A. Saintenoy, S. Chrétien, T. Baron, E. Lebrasseur, T. Laroche, S. Ballandras, and M. Griselin. High-overtone bulk acoustic resonator as passive ground penetrating radar cooperative targets. Journal of Applied Physics, 113(13) :134904–134904, 2013.
- E. Léger, A. Saintenoy, Y. Coquet. Inverting saturated hydraulic conductivity from surface ground-penetrating radar monitoring of infiltration. In Proc. of the 4th International Conference on HYDRUS Software Applications, Pragues, République Tchéque.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.2; WG4: Projects 4.1, 4.3, 4.5, 4.6).

France

MEHDI SBARTAÏ
Assistant Professor
I2M Dept of Environmental civil engineering
University of Bordeaux
351 Cours de la libération, Bât A11
Phone: 05 40 00 35 12 Fax. 05 40 00 35 95
e-mail: zm.sbartai@i2m.u-bordeaux1.fr

Biographical sketch

Mehdi Sbartaï is an assistant professor at the university of Bordeaux, department of civil engineering, *institut universitaire de technologies* since 2007. He is a researcher in the I2M laboratory in the department of environmental civil eng. He is author of more than 30 papers in international journals, conferences and books. He is a RILEM member since 2008 and a scientific member of the *diagnobeton* congress on NDT of concrete structures. His research deals with the application and development of NDT for concrete and timber structures evaluation. Main research interests are in the application of electrical and EM methods for moisture evaluation in concrete and wood.

Main experience in the Action's topics

- Application of GPR to moisture content evaluation in concrete structures.
- Combination of GPR with other non destructive methods.

Recent publications on the Action's topics

- Sbartaï et al. Combining NDT techniques for improved evaluation of concrete properties. Cement & Concrete Composites 34 (2012) 725–733.
- Sbartaï et al. Concrete properties evaluation by statistical fusion of NDT techniques. Construction and Building Materials 37 (2012) 943–950.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG2: Project 2.5; WG4: Projects 4.3, 4.4). WG Associate Member (WG3).

MOHAMMED SERHIR
Associate professor in Electromagnetic Research
Department SUPELEC,
3rue Joliot-Curie 91192 Gif-sur-Yvette, Cedex, France
Phone: +33 1 69851572
Fax: +39 1 69851569
e-mail: mohammed.serhir@supelec.fr

Biographical sketch
Mohammed Serhir has a Ph.D. degree in Electronic Engineering from the National Institute of Applied Sciences at Rennes, France, in 2007. From May 2008 to April 2009, he was C.N.R.S Post doctoral fellow in Institut Fresnel, Marseille, where he developed with the HIPE group a new microwave measurement system for the CESAR Project. From Mai 2009 to June 2010, he was a Post-doctoral fellow in SUPELEC, where he developed a new microwave near field measurement system for pulsed antennas characterization in time domain. Since June 2010 he is Assistant Professor in SUPELEC. His research interests include spherical wave expansion technique, spherical near-field antenna measurements in harmonic and time domains, near-field to far-field transformation, GPR, antenna modeling and design, development of numerical methods for electromagnetism. He is in charge of the SUPELEC antennas measurement facilities, including spherical, cylindrical and planar near-field systems. He is a member of the Institute of Electrical and Electronics Engineers (IEEE), IEEE Antennas and Prop. - Microwave Theory and Techn. – Geosci. and Remote Sensing Societies.

Main experience in the Action's topics
- Measurement of electromagnetic field radiation, radar footprint, antenna coupling.
- Development of UWB antennas for GPR applications.
- Study of multistatic radar techniques and application to GPR.
- Antenna modeling, fullwave methods, analysis and characterization of antennas.

Recent publications on the Action's topics
- M. Benhamouche, L. Bernard, M. Serhir, L. Pichon and D. Lesselier "Localization of metal targets by time reversal of electromagnetic waves" The European Physical Journal Applied Physics 2013.
- P. Aguillera, M. Ait Ou Kharraz, M. Serhir, «Conception et optimisation d'antennes large bande destinées au radar à pénétration de sol dans la bande fréquentielle [0.6GHz 3GHz]» 2013 URSI-France, Journée scientifique, Paris.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG1: Projects 1.1, 1.2; WG3: Projects 3.2, 3.3).

HERVÉ TORTEL

Assistant Professor, Aix-Marseille University/CNRS/Institut Fresnel, Campus Universitaire de Saint-Jérôme, Avenue Escadrille Normandie-Niemen, 13397 Marseille Cedex, France
Phone.: +33 (0)4 91288006 - Fax: +33 (0)4 91288067
e-mail: herve.tortel@fresnel.fr

Biographical sketch

Since 1996, Hervé Tortel's research activities are related to direct and inverse scattering problems at the Fresnel Institute. Since September 1998, he has been appointed Assistant professor at the Fresnel Institute at the University of Aix-Marseille. He has been involved in the construction and implementation of up-to-date modelling codes, in particular based on finite element formalism for electromagnetic wave propagation in complex configurations. He has also led several research works dedicated to inverse scattering applications, such as subsurface target detection, non-destructive evaluation techniques. He has therefore contributed to the development of new inversion schemes for microwave imaging purposes. He has supervised 3 PhD works during the past years and has more than 15 peer review papers in international journals.

Main experience in the Action's topics

- Development of numerical schemes for 2D/3D electromagnetic forward-scattering problems including in particular antennas and complex structures.
- Inverse scattering approaches using complete and/or aspect-limited data for qualitative and quantitative characterization.

Recent publications on the Action's topics

- S. Nounouh, C. Eyraud, H. Tortel, A. Litman "Modeling of the antenna effects and calibration for subsurface probing", MOTL 56(11) : 2516-2522, 2014.
- S. Nounouh, C. Eyraud, A. Litman, H. Tortel, "Near-subsurface imaging in an absorbing, embedding medium with a multistatic/single frequency scanner", NSG 2014.
- Y. Voznyuk, H. Tortel, A. Litman "Scattered field computation with an Extended FETI-DPEM2 method", Progress in Electromagnetics Research (2013) 139: 247-263.

Participation to other COST Actions

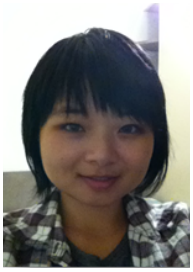
No.

Role in COST Action TU1208

WG Member (WG3: Projects 3.1, 3.2).

France

XIAOTING XIAO
PhD student in Electronics Systems
IFSTTAR Department of Geotechnical, Environment,
Natural risks and Earth Sciences
CS 04 – 44344 Bouguenais cedex – France
Phone +33 06 95 26 60 99, +33 02 40 84 56 20
e-mail: xiaoting.xiao@ifsttar.fr



Biographical sketch
Xiaoting XIAO is a PhD student of Nantes University and IFSTTAR in France. She received the Bachelor degree in Electronics and Information Engineering from Chongqing University of Posts and Telecommunications of Chongqing, China in 2010. In 2012, she received the Master degree of Electronics Systems and Electrical Engineering from the French engineering school "École d'ingénieurs de l'université de Nantes", where she developed her interests in electromagnetism and radar propagation. She is now working on the thesis "Determination of water content gradients in concrete by electromagnetic methods" under the supervision of Dr. Xavier Derobert in the laboratory of auscultation and imaging of IFSTTAR, Nantes. Her main research interests are in characterizing electromagnetic and physical properties and estimating the water content inside of civil engineering structures with the applications of Ground Penetrating Radar.

Main experience in the Action's topics
- Parametric study on GPR data processing for concrete.
- Development of full-wave methods for the solution of electromagnetic inverse-scattering problems.

Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.4-2.5; WG3: Project 3.2).

VINCENT BALTAZART
Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux (IFSTTAR), Bouguenais Cedex, France
e-mail: vincent.baltazart@ifsttar.fr

Role in COST Action TU1208
WG Member (WG1: Project 1.1; WG3: Projects 3.2, 3.3).

CYRILLE FAUCHARD
Centres d'Etudes Techniques de l'Equipement (CETE), Angers – Blois – Les Ponts de Cé, France
e-mail: cyrille.fauchard@developpement-durable.gouv.fr

Role in COST Action TU1208
WG Member (WG2: Projects 2.1, 2.5; WG4: Projects 4.1, 4.3, 4.5).

JEAN-LUC GARCIAZ
Laboratoire d'Etudes et de Recherches sur les Matériaux (LERM), Arles Cedex
e-mail: jl.garciaz@lerm.fr

Role in COST Action TU1208
WG Associate Member (WG2; WG4).

GILLES KLYSZ
Institut National des Sciences Appliquées (INSA), Toulouse, France
e-mail: gilles.klysz@insa-toulouse.fr

Role in COST Action TU1208
WG Associate Member (WG2; WG4).

CHRISTIAN PICHOT DU MEZERAY
University Nice Sophia Antipolis, Sophia Antipolis, France
e-mail: christian.pichot@unice.fr

Role in COST Action TU1208
MC Substitute Member. WG Member (WG3: Projects 3.1, 3.3, 3.4).

GÉRALDINE VILLAIN
Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux (IFSTTAR), Bouguenais Cedex, France
e-mail: geraldine.villain@ifsttar.fr

Role in COST Action TU1208
WG Member (WG2: Projects 2.4, 2.5; WG4: Project 4.3).

fYR of Macedonia

PERO LATKOSKI
Assistant Professor in Telecommunications
Ss Cyril and Methodius University – Skopje
Faculty of Electrical Engineering and information Technology
Rugjer Boskovik bb, 1000 Skopje
Phone: +389 2 3099113 Fax: +389 71 358456
e-mail: pero@feit.ukim.edu.mk

Biographical sketch

Dr. Pero Latkoski holds the position of assistant professor at the Institute of Telecommunications, Faculty of Electrical Engineering and Information Technologies, Ss Cyril and Methodius University in Skopje. He has received his B.Sc, M.Sc and Ph.D. from Ss Cyril and Methodius University in Skopje, in 2004, 2006 and 2010, respectively. Dr. Latkoski participated in numerous EU funded projects such as SEEFIRE, SEEGRID, QUASAR, NATO funded projects RIWCoS and ORCA, as well as in several domestic research and applicative projects. Dr. Latkoski is author of more than 50 research journal and conference papers. His major research interests include communication protocol engineering, telecommunications software, software defined networking, information theory, antenna engineering and optical networking.

Main experience in the Action's topics

- Modeling and analysis of antennas, taking into account antennas shape, radiation pattern and position.
- Synthesis, analysis and experimental characterization of antennas.
- Development of data processing and calculation methods.
- Measurement of electromagnetic spectrum.

Recent publications on the Action's topics

Role in COST Action TU1208

- MC Substitute Member. WG3 Member (Project 3.3).

fYR of Macedonia

BORISLAV POPOVSKI
Professor in Telecommunications
Ss Cyril and Methodius University – Skopje
Faculty of Electrical Eng. And information Tech.
Rugjer Boskovik bb, 1000 Skopje
Phone: +389 2 3099117 Fax: +389 75 425550
e-mail: borop@feit.ukim.edu.mk

Biographical sketch

Dr. Borislav Popovski received B.Sc. degree in telecommunications at the Faculty of Electrical Engineering, Ss. Cyril and Methodius University - Skopje, Macedonia in 1987, M.Sc. and Ph.D. degrees in telecommunications at the Faculty of Electrical Engineering and Computer Science, University of Zagreb, Croatia in 1993 and 1996, respectively. At present, he holds a position of full professor at the Institute of telecommunications, Faculty of Electrical Engineering and Information Technologies (FEEIT), Ss. Cyril and Methodius University - Skopje, where he conducts graduate, postgraduate and doctoral courses. Prof. Popovski is a Head of the Laboratory of telecommunications at the FEEIT-Skopje. His research interests include topics on optical networks, wireless communications, and antenna and microwave technology. He is author of numerous scientific papers published in international journals and conferences. Prof. Popovski was leader of several FP5 and FP6 projects such as SEEREN, SEEREN2, SEEFIRE. He has strong record as consultant in the field of telecommunications with several projects realized with national wide coverage. In the period 2003-2007 Prof. Popovski was President of the Management Board of MARNET - Macedonian Academic and Research Network. In the period 2001 – 2004, Prof. Popovski served as Vice-Dean for finance at the Faculty of Electrical Engineering and Information Technologies – Skopje. Prof. Popovski is a member of Expert Council of MASIT - Macedonian Association of Information Technology and a member of IEEE Communication Society.

Main experience in the Action's topics

- Modeling and analysis of antennas, taking into account antennas shape, radiation pattern and position.
- Synthesis, analysis and experimental characterization of antennas.
- Development of data processing and calculation methods.
- Measurement of electromagnetic spectrum.

Role in COST Action TU1208

MC Member. WG3 Member (Project 3.3).

Germany

JOERG ENDOM

Projectmanager / Senior Geophysicist
DMT GmbH & Co. KG, Project Office Hamburg
Grosse Bahnstrasse 31, D-22525 Hamburg, Germany
Phone: +49 40 8557 2694
Fax: +49 40 8557 2716
e-mail: joerg.endom@dmt.de

Biographical sketch

Joerg Endom, born in 1966, received the Diploma degree in Geophysics from Christian-Albrechts-University, Kiel, Germany in 1993. He worked as scientific assistent at Rheinische-Friedrich-Wilhelms-University, Bonn, Germany in the field of seismically induced pore pressure variations in confinded and unconfinded acquifers. He then started as a project engineer at a consulting office in Weimar, Germany. His main business was using GPR for route inspection prior to horizontal directional drilling projects. From 1998 to 2002 he was owner of a consulting office specialised on GPR applications. Since 2002 he is working in several subsidiaries of TUEV NORD GROUP. Actually he is working at DMT GmbH & Co. KG and runs the project office at Hamburg. The office is specialised in NDT technologies in civil engineering. He is member of European Association of Geoscientists & Engineers, Environmental & Engineering Geophysical Society, German Geophysical Society, and German Road and Transportation Research Association. He is approved evaluator for NDT technologies in civil engineering at DAkkS (National Accredition Body for Germany) for accreditions acccording to DIN EN ISO/IEC 17025 and lecturer at Jade University of Applied Science, Oldenburg and Drilling Technical College, Celle holding courses for the German Technical and Scientific Association for Gas and Water. He was reviewer for “Rail International” and “Journal of Infrastructure Systems”.

Main experience in the Action’s topics

- Applications of GPR in civil engineering.
- Collection of huge data sets and high precisison data on limited areas.
- Experience in collecting GPR data with high precision position.

Recent publications on the Action’s topics

NA.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Substitute Member. WG Member (WG2: Project 2.1; WG3: Project 4.3).

Germany 

MARIA ANTONIA GONZALEZ HUICI

Researcher in Radar
Fraunhofer Institute for High Frequency, Physics and Radar
Techniques FHR – Department Cognitive Radar
Fraunhoferstraße 20, 53343 Wachtberg, Germany
Phone:+49 2289435708 - Fax: +49 2289435627
e-mail: maria.gonzalez@fhr.fraunhofer.de

Biographical sketch

María A. González-Huici received the M.Sc. degree in Theoretical Physics from the Autonomous University of Madrid, Spain, in 2002 and the PhD in Geophysics from the University of Bonn, Germany, in 2013. From 2002 to 2005, she participated in the Bonn International Graduate School and carried out postgraduate studies initially in Cosmology and Particle Physics and later on, in Applied Geophysics. Since May 2005, she is with the Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, Wachtberg, Germany. Between 2009 and 2011, she was employed by the Zentrum für Sensorsysteme, ZESS, of the University of Siegen, Germany, in a project for sensor based ground surveillance to control the stability of mobile construction machines. Her main research interests cover, Forward Looking and Down Looking GPR, UWB systems, radar signal and image processing, scattering and electromagnetic modeling, subsurface imaging and soil characterization, and target detection/classification techniques in complex media. Other interests include millimeter-wave radar, lidar and nobel imaging algorithms, inverse problems and compressive sensing.

Main experience in the Action's topics

- Experience in realistic modeling of complex GPR scenarios: antenna-soil-interface-targets using GprMax 2.0 and COMSOL Multiphysics modelling software.
- Investigation and implementation of GPR imaging approaches: Stolt and phase-shift migration, SAR techniques and experimental characterization of GPR antennas.

Recent publications on the Action's topics

Gonzalez-Huici, M.A., Soldovieri, F. and Capatano, I., "A Comparative Study of GPR reconstruction approaches for Landmine Detection", IEEE JSTARS, 2014.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG3: Projects 3.1, 3.2).

Germany

FRANÇOIS JONARD
Researcher in Hydrogeophysics and Microwave Remote Sensing
Agrosphere (IBG-3) – Institute of Bio- and Geosciences
Forschungszentrum Jülich GmbH, 52425 Jülich, Ger.
Phone.: +49 2461 61 9518 - Fax: +49 2461 61 2518
e-mail: f.jonard@fz-juelich.de

Biographical sketch

François Jonard received an M.Sc. and a Ph.D. degree in environmental engineering from the Université catholique de Louvain (UCL, Belgium), in 2002 and 2012, respectively. From 2003 to 2004, he worked at the Earth and Life Institute (UCL) as a Research Assistant on forest hydrology modeling. In 2005, he received a Master's degree in business administration at the Louvain School of Management (UCL). From 2006 to 2009, he was a Consultant with the European Commission in the fields of geographic information systems and remote sensing applied to environmental issues. In 2009, he obtained a three-year Ph.D. grant from the Forschungszentrum Jülich (FZJ, Germany) funded by the German Research Foundation. The topic of his Ph.D. thesis was "soil water content estimation using ground-based active and passive microwave remote sensing". In 2011, he spent three months at NASA's Goddard Space Flight Center (USA), working in the context of the upcoming SMAP mission. Since March 2012, he is working as a Postdoc. Researcher with the Agrosphere, Institute of Bio- and Geosciences (FZJ).

Main experience in the Action's topics

- Development and evaluation of inverse and forward modeling approaches to retrieve soil moisture from GPR and passive microwave data.
- Development of unique field setups for detailed radiometer and off-ground GPR studies.

Recent publications on the Action's topics

- Jonard F., Mahmoudzadeh M., Roisin C., Weihermüller L., André F., Minet J., Vereecken H., and Lambot S. 2013. Characterization of tillage effects on the spatial variation of soil properties using ground-penetrating radar and electromagnetic induction. Geoderma, 207-208: 310-322.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG2: Projects 2.1, 2.3, 2.5; WG3: 3.1-3.4).

Germany

THOMAS KIND

Researcher at BAM, Federal Institute For Materials Research And Testing - Division 8.2 Non-Destructive Damage Assessment and Environmental Measurement Methods, Unter den Eichen 87, 12205 Berlin, Germany,
Phone: +49 30 8104-3225 - Fax: +49 30 8104-1447
e-mail: thomas.kind@bam.de

Biographical sketch

Thomas Kind received the Diploma degree in Electrical Engineering from the Technical University Berlin (TUB), Germany in 1993. After his diploma he collected 5 years experience in microelectronics at the Institute of Microelectronics (TUB) and 3 year experience on testing electrical medical implants for one of the leading manufactures of pacemakers. Since 2001 Thomas Kind is working for the Federal Institute for Materials Research and Testing in the non-destructive testing group for civil engineering. From the beginning his main working field is the development and application of GPR. He is involved in several national and international committees on impulse radar and he was member of the FP5 project SMARTRAD, and FP6 SAFERAIL and coordinator the FP6 project CHEF. Currently he is leading a German research project for road assessment by GPR.

Main experience in the Action's topics

- Applications of GPR in civil engineering.
- Automation of GPR measurement by mechanical scanning systems.
- Application of multi antenna GPR system including antenna development.
- Research on material properties and structure reconstruction by GPR.

Recent publications on the Action's topics

- Trela, Ch.; Kind, Th.; Schubert, M. (2012): Positioning accuracy of an automatic scanning system for GPR measurements on concrete structures, 14th International conference on ground penetrating radar – Proc. GPR 2012, Tongji University, Shanghai, 309-313.
- Kind, T. and Wöstmann, J. (2012), Kombinierte Radar- und Ultraschalluntersuchungen zum schadfreien Kernbohren im Zuge einer Verstärkung. Beton- und Stahlbetonbau (Wiley), 107: 255–261.
- Lai, W.L.; Kind, Th.; Stoppel, M.; Wiggenhauser, H. (2013) Measurement of accelerated steel corrosion in concrete using ground penetrating radar (GPR) and a modified half-cell potential method, ASCE Journal of Infrastructure Systems.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG Member (WG2: Projects 2.1, 2.2, 2.4; WG4: Projects 4.3, 4.4).

Germany

ANJA KLOTZSCHE
Researcher in Electromagnetics and Hydrogeophysics
Forschungszentrum Jülich GmbH
Agrosphere, Institute of Bio- and Geosciences, 52425 Jülich, Germany
Phone.: +49 2461 611796 - Fax: +49 61-2518
E-mail: a.klotzsche@fz-juelich.de

Biographical sketch
Anja Klotzsche received a Master's degree in Applied Geophysics in 2009 in a Joint Master Program of the TU Delft (Netherlands), ETH Zurich (Switzerland) and RWTH Aachen (Germany). In 2013 she obtained a PhD in Hydrogeophysics from the RWTH Aachen (Germany) and was working as a research assistant in the Agrosphere, Institute of Bio- and Geosciences at Forschungszentrum Jülich, Germany from 2009 to 2013. Since Febr. 2013, she is working at the same institute as a Postdoctoral Researcher. In 2011 and 2012 she spent three months as a guest scientist at the Boise State University (Idaho, USA). Her work was twice awarded with the Young scientist Best Paper Award 2010 at the XIII International Conference on Ground Penetrating Radar, and 2012 at the 14th International Conference on Ground Penetrating Radar. She is the author/co-author of 16 on international journals and conference proceedings. Her main research activity is focused on Hydrogeophysics and GPR Full-waveform inversion for borehole and surface data.

Main experience in the Action's topics
- Development of full-waveform methods for crosshole and surface GPR.
- Electromagnetic wave behavior in dispersive media and waveguides.
- Applications of GPR in civil engineering.

Recent publications on the Action's topics
- A. Klotzsche, J. van der Kruk, J. Bradford, and H. Vereecken, "Detection of spatially limited high porosity layers using crosshole GPR signal analysis and full-waveform inversion," Water Resources Research, 2014, under review.
- A. Klotzsche, A., J. van der Kruk, N. Linde, J. Doetsch, and H. Vereecken, "3-D characterization of high-permeability zones in a gravel aquifer using 2-D crosshole GPR full-waveform inversion and waveguide detection," Geophysical J. International, 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.2).

Germany

MIOMIR MILJKOVIĆ

Research Associate
Ruhr-Universität Bochum, Chair of Pavement Engineering, Universitätsstraße 150, IC 4/143, 44801 Bochum, Germany
Phone: +492343225178; +491751016040
e-mail: miomir.miljkovic@rub.de

Biographical sketch
Miomir Miljković is a research associate and the doctoral candidate of Ruhr-Universität Bochum (Germany), Chair of Pavement Engineering. His main research interests comprise asphalt pavement engineering, bitumen emulsions, reclaimed asphalt and cold recycling of asphalt mixtures, mechanics of asphalt, performance-based testing and specifications for asphalt, etc. He is a member of national and international committees of German Institute for Standardization (DIN), Road and Transportation Research Association (FGSV), and International union of laboratories and experts in construction materials, systems and structures (RILEM). He is the author of numerous publications in the field of asphalt pavements in international journals and conference proceedings, and a reviewer, among others, for Elsevier Construction and Building Materials, ASCE Journal of Materials in Civil Engineering, RILEM Materials and Structures, and Taylor & Francis Road Materials and Pavement Design.

Main experience in the Action's topics
Application of non-destructive testing methods in pavement engineering.

Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.1, 2.3, 2.4, 2.5; WG4: Projects 4.3, 4.4).

Germany

MARIO PAULI

Senior Researcher and Lecturer at
Karlsruhe Institute of Technology (KIT)
Institute of Microwave Techniques and Electronics
76131 Karlsruhe, Germany
tel.: +49 721 608 46259
fax: +49 721 608 45027
e-mail: mario.pauli@kit.edu

Biographical sketch

Mario Pauli received the Dipl.-Ing. (M.S.E.E.) degree in electrical engineering from the University of Karlsruhe, Germany, in 2003 and the Dr.-Ing. (Ph.D.E.E.) degree from the Karlsruhe Institute of Technology (KIT) in 2011. In 2002, he spent 4 months at the IBM T.J. Watson Research Center in Yorktown Heights, NY, working on time and frequency domain measurement systems for the characterization of the 60 GHz indoor radio channel. From 2004 to 2011 he was with the Institut für Höchstfrequenztechnik und Elektronik, University of Karlsruhe, as a Research Assistant. Since 2011 he is with the Institute of Microwave Techniques and Electronics at KIT as a Senior Researcher and Lecturer. For the Carl Cranz Series for Scientific Education he served as a Lecturer for radar and smart antennas.

Main experience in the Action's topics

- Radar Systems and antennas.
- Microwave measurements.
- Application of radar sensors in industrial and scientific applications.

Recent publications on the Action's topics

- S. Scherr, S. Ayhan, H. Gulan, M. Pauli, and T. Zwick, "61 GHz ISM Band FMCW Radar For Applications Requiring High Accuracy", Proceedings of the Asia-Pacific Microwave Conference (APMC), Sendai, Japan, Nov. 2014
- M. Pauli, T. Kayser, W. Wiesbeck, and V. Komarov, "Impedance Matching of a Coaxial Antenna for Microwave In-situ Processing of Polluted Soils", Journal of Microwave Power and Electromagnetic Energy, 45 (2), 2011, pp. 70-78
- G. Adamiuk, M. Pauli, and T. Zwick, "Principle for the Realization of Dual-Orthogonal Linearly Polarized Antennas for UWB Technique" International Journal of Antennas and Propagation, Hindawi Publishing Corporation, 2011.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (Project 1.2).

Germany

MARTIN RADENBERG
Professor
Ruhr-Universität Bochum
Universitätsstraße 150, IC 4/127, 44801 Bochum,
Germany
Phone:+492343227437
e-mail: martin.radenberg@rub.de

Biographical sketch
Martin Radenberg is professor of Ruhr-Universität Bochum (Germany), Chair of Pavement Engineering on which position he was announced in year 2005. Before the academic engagement, he was on several positions in asphalt industry and research. His main research area is asphalt pavement engineering and he is predominantly focused on cold recycling of asphalt, noise reduction, bituminous binders, etc. He is the head and the member of many German national committees of Road and Transportation Research Association (FGSV) for local roads, roughness, pavement design and standardisation, reclaimed asphalt, cold recycling, unbound layers, performance-based characterisation of pavement materials, bitumen and bituminous binders, surface properties of pavements, temperature reduction, etc., and member of German asphalt institute, German asphalt association, and Professional association of construction industry. He is author of numerous publications on asphalt pavements in international journals and conference proceedings.

Main experience in the Action's topics
Application of non-destructive testing methods in pavement engineering.

Recent publications on the Action's topics
NA.

Role in COST Action TU1208
WG Member (WG2: Projects 2.1, 2.3- 2.5; WG4: Projects 4.3, 4.4).

Germany

RABE ROLF

Senior Researcher Pavement Engineering
Federal Highway Research Institute (BASt)
Dept. of Highway Construction Technology
Bruederstrasse 53, D-51427 Bergisch Gladbach
Phone.: +49 3677 692618 Fax: +49 3677 691113
e-mail: rudolf.zetik@tu-ilmenau.de

Biographical sketch

Rolf Rabe received his diploma degree in Civil/Structural Engineering from the Technical University of Dortmund, Germany. As senior researcher at the Department of Highway Construction Technology at BASt (Bundesanstalt fuer Strassenwesen – Federal Highway Research Institute) he has been working in the field of pavement engineering for more than 12 years now. His work includes accelerated pavement full scale testing and response measurements, structural pavement design and assessment, analytical pavement design, pavement condition monitoring, material testing, vehicle dynamics, design and application of pavement sensors as well as bearing capacity issues and ground penetrating radar measurements and applications. Among the active membership in national German committees of the FGSV (Forschungsgesellschaft fuer das Strassen- und Verkehrswesen - German Road and Transport Research Association) "Asphalt performance testing", "Bearing capacity of pavements", "Guidelines for the structural assessment of pavements", "Material testing procedures for pavement design" and "Guidelines for analytic design of asphalt pavements" he is the leader of working group "GPR for structural pavement assessment" and "NDT methods for asphalt pavements". On an international level Rolf is a member of the programme executive board of the CEDR 2013 "Ageing Infrastructure" call and the project manager of the Hi-SPEQ project (Hi-speed survey Specifications, Explanation and Quality).

Main experience in the Action's topics

GPR applications for the determination of pavement layer thickness. Integration of GPR measurements in pavement condition monitoring procedures. Supplement of bearing capacity measurements with GPR data.

Recent publications on the Action's topics

- Rabe, R: "Strength rating of selected pavement sections and their variations in bearing capacity and layer thickness," Workshop on the Curviameter, 2014, BRRC, Brussels, BE.
- Rabe, R: "Structural pavement monitoring with non-destructive measuring devices – Experiences from a pilot project in Germany," 9th Intl. Conference on the Bearing Capacity of Roads, Railways and Airfields, 2013, Trondheim, Norway.

Participation to other COST Actions

COST Action 347 "Improvements in Pavement Research with Accelerated Load Testing".

Role in COST Action TU1208

WG Member (WG2: Projects 2.1, 2.4, 2.5; WG4: Projects 4.4, 4.5).

Germany

JÜRGEN SACHS
Senior researcher at
Technische Universität Ilmenau
Electronic Measurement Engineering Group
PSF 100 565, 98684 Ilmenau, Germany
Phone.: +49 3677 692623 - Fax: +49 3677 691113
e-mail: juergen.sachs@tu-ilmenau.de

Biographical sketch
Jürgen Sachs is Senior Lecturer at Ilmenau University of Technology, Germany. He Teaches "Basics of Electrical Measurement Technology", Measurements in Communications" and "Ultra-Wideband Radar Sensing". He is head of several research projects, and inter alia coordinator of European projects for humanitarian demining and disaster relief. His research areas cover RF-signal analysis and RF-system identification; Surface Penetrating Radar for non-destructive testing and medical engineering, ultra wideband methods and their application in high-resolution radar and impedance spectroscopy, digital processing of ultra wideband signals, array processing; and design and implementation of new RF device approaches.

Main experience in the Action's topics
- UWB radar design, UWB measurements and Application of UWB sensors in surveillance situation.
- Through the wall localization of tag free objects.
- Microwave imaging.
- Monitoring of breathing and heartbeat activity of people.

Recent publications on the Action's topics
- Sachs J. Handbook of Ultra-Wideband Short-Range Sensing - Theory, Sensors, Applications. Berlin: Wiley-VCH; 2012. 840 p.
- Sachs J, Helbig M, Herrmann R, Kmec M, Schilling K, Zaikov E. Remote Vital Sign Detection for Rescue, Security, and Medical Care by Ultra-Wideband Pseudo-Noise Radar. Ad Hoc Networks. 2012.
- Sachs J, Kmec M, Fritsch HC, Helbig M, Herrmann R, Schilling K, et al. Ultra-Wideband Pseudo-Noise Sensors. Applied Radio Electronics. 2013;12(1):79-88.

Participation to other COST Actions
COST Action TD1301 (MC Member).

Role in COST Action TU1208
WG Member (WG1: Project 1.1; WG2: Projects 2.1, 2.2).

Germany

CHRISTIANE TRELA

Researcher at BAM, Federal Institute for Materials Research and Testing - Division 8.2 Non-Destructive Damage Assessment and Environmental Measurement Methods, Unter den Eichen 87, 12205 Berlin, Germany
Phone: +49 30 8104-4271 - Fax: +49 30 8104-1447
e-mail: christiane.trela@bam.de

Biographical sketch

Christiane Trela received the Diploma degree in Geophysics from the Technical University of Freiberg, Germany. During her work for the German Research Centre for Geosciences (GFZ) in Potsdam she was acquiring and processing seismological and seismic data in the Continental Deep Drilling Program of the Federal Republic of Germany (KTB) and finished her work there with a doctoral dissertation. Her main research interests are now at BAM structural and material investigation on concrete and masonry with ground penetrating radar and its application with automated scanning systems using antenna arrays and the efficient data processing. She is a member of the German Geophysical Society (DGG).

Main experience in the Action's topics

- Applications of GPR in civil engineering on concrete and masonry structures.
- Development of calibration procedures of GPR antennas.
- Automated scanning measurements in reflection and transmission mode.
- Numerical modelling and advanced data processing.

Recent publications on the Action's topics

- Cotic, P.; Jaglicic, Z.; Niederleithinger, E.; Effner, U. ; Kruschwitz, S.; Trela, Ch.; Bosiljkov, V. (2013): Effect of Moist. on the Reliability of Void Detect. in Brickwork Masonry Using Radar, Ultras. & Compl. Resist. Tom., Mater. & Struct., DOI:10.1617/s11527-012-0011-3
- Trela, Ch.; Kind, Th.; Schubert, M. (2012): Positioning accuracy of an automatic scanning system for GPR measurements on concrete structures, 14th International conference on GPR 2012 (Proceedings), Tongji University, Shanghai, pp. 309-313.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG Member (WG1: Project 1.1; WG2: Project 2.5).

Germany

JAN VAN DER KRUK
Research group leader "hydrogeophysical imaging and characterisation", Prof in Hydrogeophysics (RWTH Aachen) - Agrosphere (IBG-3), Institute of Bio- and Geoscience, Forschungszentrum Jülich
Leo-Brandtstraße, 52425 Jülich, Germany
Phone.: +49 2461 614077 - Fax: +49 2461 612518
e-mail: j.van.der.kruk@fz-juelich.de

Biographical sketch
Jan van der Kruk received a master's degree in electrical engineering in 1995 and a PhD in geophysics in 2001 from Delft University of Technology. From 2001 to 2008, he was a lecturer and senior researcher with the Applied and Environmental Geophysics Group at ETH Zurich. Since 2008, he has held a professorship position with RWTH Aachen Univ., and is a research group leader with the Research Center Jülich. He has (co-)authored over 100 scientific publications. He was involved in 5 special issues dealing with GPR and Hydrogeophysics. He received in 2000 the Best Paper Award from the Dept. of Applied Earth Sciences, Delft University of Technology, and a Honorable Mention for Best Paper in Geophysics in 2006. In 2011, he was general chair of the International Workshop on Advanced GPR in Aachen Germany, and in 2012 he co-organised the SEG-AGU Hydrogeophysics Workshop.

Main experience in the Action's topics
Development of off-ground GPR full-waveform inversion (FWI) methods for 3D horizontal layers, crosshole GPR FWI in 2D media, dispersion inversion algorithms for waveguide dispersive GPR data, 3D true-amplitude migration/imaging of GPR data, quantitative multi-layer conductivity inversion of multi-configuration em induction measurements.

Recent publications on the Action's topics
- S. Busch, J. van der Kruk, H. Vereecken, Improved characterization of fine texture soils using on-ground GPR full-waveform inversion, IEEE Trans. Geosci. Remote Sensing, 2014.
- A. Klotzsche, J. van der Kruk, N. Linde, J. Doetsch, H. Vereecken, 3D characterization of high-permeability zones in a gravel aquifer using 2D crosshole GPR full-waveform inversion and waveguide detection, Geophysical J. International, 195, 932-944, 2013.
- NSG, Special Issue on "Advanced GPR Imaging and Inversion for hydrogeophysical and subsurface property estimation", J. van der Kruk, E. Slob, L. Crocco, Eds., Vol. 11, 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG3 Vice-Chair. WG Member (WG3: Projects 3.1-3.4, WG4: Projects 4.1-4.6).

Germany

WERNER WIESBECK

Professor em.
Karlsruhe Institute of Technology
Kaiserstr. 12, 76131 Karlsruhe, Germany
Phone: +49 721 608 43303
e-mail: werner.wiesbeck@kit.edu

Biographical sketch

Werner Wiesbeck received the Dipl.-Ing. (M.S.E.E.) and Dr.-Ing. (Ph.D.E.E.) degrees from the Technical Univ. Munich in 1969 and 1972, respectively. From 1972 to 1983 he was with AEG-Telefunken in various positions including that of head of R&D of the Microwave Division in Flensburg and marketing director Receiver and Direction Finder Division, Ulm. From 1983 to 2007 he was Director of the Institut für Höchstfrequenztechnik und Elektronik at the Univ. of Karlsruhe and he is now Distinguished Senior Fellow at the Karlsruhe Institute of Technology. He is (co-)author of several books and of more than 800 publications, supervisor of more than 90 PhDs, responsible supervisor of over 600 Diploma/Master theses, and he holds over 60 patents. He is/was a member of the IEEE GRS-S AdCom (1992-2003), Chairman of the GRS-S Awards Committee (1994–1998, 2002-), Executive Vice President IEEE GRS-S (1998-1999), President IEEE GRS-S (2000-2001), Associate Editor IEEE-AP Trans. (1996-1999), past Treasurer of the IEEE German Section (1987-1996, 2003-2007). He was General Chairman of the '88 Heinrich Hertz Centennial Symposium and '93 Conference on Microwaves and Optics, Technical Chairman of the Intl. mm-Wave and Infrared Conference 2004, Chairman of the German Microwave Conference GeMIC 2006. For the Carl Cranz Series for Scientific Education he serves as a permanent lecturer for Radar systems engineering, wave propagation and mobile communication network planning. He is the recipient of a number of awards, lately the IEEE Millennium Award, IEEE GRS Distinguished Achievement Award, IEEE Electromagnetics Award 2008, Honorary Doctorates from the University of Budapest, the University of Duisburg, and the Technische Universität Ilmenau. He is a Fellow of IEEE, Honorary Life Member of IEEE GRS-S, Member of the Heidelberger Academy of Sciences and Humanities and of the German Academy of Engineering and Technology.

Main experience in the Action's topics

GPR: Soil moisture, MIMO & Polarimetric GPR – UWB: Antenna design, Fidelity, Target location – SAR: Antenna array, Phased array, Digital Beamforming – 2D Signal coding, array imaging.

Recent publications on the Action's topics

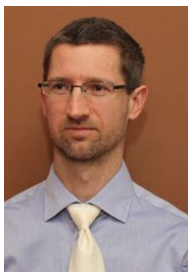
W. Wiesbeck, L. Sit, "Radar 2020: The Future of Radar Systems," in Radar 2014 Conference Proceedings, Lille, France, 15. Oct. 2014. – R. Zetik et al., "Cooperative Localization and Object Recognition in autonomous UWB Sensor Networks," in Ultra-Wideband Radio Technologies for Communications, Localization and Sensor Applications, InTech, 2013.

Role in COST Action TU1208

WG Member (WG1: Projects 1.1, 1.2). Coordinator of the COST-ESoA Training Schools "Radar 2020: Future Radar Systems" & "UWB Antennas: Theory, Techniques, Applications."

Germany

RUDOLF ZETIK
Researcher and academic counceler at
Technische Universität Ilmenau
Electronic Measurement Engineering Group
PSF 100 565, 98684 Ilmenau, Germany
Phone.: +49 3677 692618
Fax: +49 3677 691113
e-mail: rudolf.zetik@tu-ilmenau.de



Biographical sketch
Rudolf Zetik received his M.Sc. and Ph.D. degree in Electrical Engineering from Technical University Kosice, Slovakia in 1997 and 2001, respectively. Currently, he is working as a senior research assistant at Ilmenau University of Technology in Germany. He has contributed to multiple European and German research projects such as PULSERS, EUWB, NEWCOM, Radiotect, CoLOR. His research interests include digital signal analysis and their application in ultra-wideband sensor systems, real-time MIMO channel sounding, ground penetrating radar, people detection and localization, radar imaging.

Main experience in the Action's topics
- Imaging of environments.
- Through the wall localization of tag free objects.
- Detection, lokalization and tracking of people.
- Monitoring of breathing and heartbeat activity of people.
- UWB measurements.
- Application of UWB sensors in surveillance applications.

Recent publications on the Action's topics
- Zetik, R.; Thoma, R.S., "Ultra-Wideband channel sounder — Design, construction and selected applications," Telecommunications Forum (TELFOR), 2012 20th , vol., no., pp.975,978, 20-22 Nov. 2012.
- Zetik, R.; Roding, M.; Thoma, R.S., "UWB localization of moving targets in shadowed regions," Antennas and Propagation (EUCAP), 2012 6th European Conference on , vol., no., pp.1729,1732, 26-30 March 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Project 2.2; WG4: Project 4.2).

CHRISTIAN KOPP
Federal Institute for Material Research and Testing (BAM),
Berlin, Germany
e-mail: christian.koepp@bam.de

Role in COST Action TU1208
MC Substitute Member. WG Associate Member (WG2).

SIMONE MESCHINO
Airbus Gmbh, Friedrichshafen, Germany
e-mail: simone.meschino@gmail.com

Role in COST Action TU1208
WG Member (WG3: Projects 3.1, 3.2).

Greece

NIKOS ANDRONIKIDIS
Researcher in Geophysics,
"Technical University of Crete", Dept. of Mineral Resources Engineering
Polytechnioupolis, Kounoupidiana, 73100 Chania, Crete, Greece
Phone: +30 28210 37681 - Fax: +30 28210 20710
e-mail: nandron@mred.tuc.gr

Biographical sketch
Nikos Andronikidis obtained a B.Sc. in Mineral Resources Engineering from the Technical University of Crete, with a thesis related to an integrated research in coal quality from West Macedonia, Greece, during 1994-1995. In 1998 he received a M.Sc. related to the coal enrichment. His Ph.D thesis from the same institute is related with seismic reflection data processing and interpretation from a South Aegean seismic line. After 1998, he was a scientific cooperator and since 2006 he belongs to the permanent personnel at the Applied Geophysics Lab of the Mineral Resources Engineering Dept., where he teaches laboratory exercises for the courses related to seismics and to near surface geophysical methods (electromagnetics, GPR, electrical sounding, magnetics, and gravity). He is the author and co-author of 6 papers in international scientific journals and co-author of 8 papers in Proc. of international conferences. His main research interest is the application of geophysical methods in both geotechnical and environmental problems.

Main experience in the Action's topics
- Development of signal processing algorithms.
- Application of GPR in civil eng., archaeology, geotechnical and environmental tasks.

Recent publications on the Action's topics
- N. Economou, A. Vafidis, H. Hamdan, G. Kritikakis, N. Andronikidis, K. Dimitriadis, "Time varying deconvolution of GPR data in civil engineering," Nondestructive Testing and Evaluation, Vol. 27(3), pp. 285-292, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.4).

Greece

PEPI AVLONITOU
Graphic Designer
GEOSERVICE
52, Markou Drakou St, 114 76 Athens, Greece
Phone:0030 210 6469 865 Fax: 0030 210 0069915
e-mail: pepi.avlonitou@geoservice.gr

Biographical sketch
Pepi Avlonitou received her diploma in Fine Arts from the "Ecole Superieure des Arts Decoratifs de Strasbourg", University of Strasbourg, France. Since 2013, she is providing specific graphics design services to GEOSERVICE company especially in combining the raster and/or vector geophysical results of many geophysical applications (GPR, ERT, Seismics) with the existing optical information (such as geological maps, architectural objects, anthropogenic constructions with archaeological character and other). In reality she improves the visualization of the geophysical targets by enhancing their physical meaning using modern graphics software and dedicated know how. She is also skilled in free design but also in photo color processing by using the latest graphics processing software in Apple Macintosh and Windows environments. In addition, she is familiar with the most frequently applied methods of GEOSERVICE Company such as: Ground Penetrating Radar, Electric Resistivity Tomography, Geophysical Well Logging and other. A part of these, she is expert in geo-database management of different types of subsurface physical parameters recording (time lapse recording, digitalization of analog records, creation of graphics charts etc). Speaks fluently French and English. Since 2013 she is involved in many projects of GEOSERVICE in Greece ("CONSTRUCTION OF THE NIARCHOS CULTURAL CENTER" in Athens, "NON-DESTRUCTIVE TESTING OF THE ANTIKYTHERA SHIPWECK COLLECTION" in Athens and "LAZIENKI PALACE RESTORATION", in Warsaw.

Main experience in the Action's topics
Applications of GPR for the non-destructive testing of statues and architectural objects of important cultural heritage value.

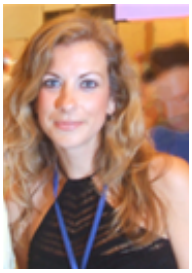
Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG4: Projects 4.1, 4.4).

Greece

NECTARIA DIAMANTI
Dr Geophysicist
Aristotle University of Thessaloniki
Department of Geophysics
GR-54 124, PO Box 352-1, Thessaloniki, Greece
Phone: +30 2310 991420 Fax: +30 2310 991403
e-mail: ndiamant@geo.auth.gr



Biographical sketch
Nectaria Diamanti received her B.Sc. in Geology and her M.Sc. in Geophysics, both from the Aristotle University of Thessaloniki, Thessaloniki, Greece. In 2008, she obtained her Ph.D. in Engineering & Electronics from The University of Edinburgh, Edinburgh, U.K. Since 2009, she has been working at the Department of Geophysics, at the Aristotle University of Thessaloniki. Her main research activity involves application of geophysical techniques and especially Ground Penetrating Radar (GPR) to geophysical problems ranging from environmental monitoring and non-destructive testing of structures, to archaeological prospection and engineering geophysics. Her areas of research include: numerical modelling using the FDTD technique, application of numerical modelling to GPR. She is a member of the European Association of Geoscientists & Engineers (EAGE), Society of Explorations Geophysicists (SEG).

Main experience in the Action's topics
- Two- and three-dimensional forward numerical modelling for electromagnetics.
- Numerical modelling of near-field antenna effects.
- Applications of GPR and other NDT in archaeological, geological and civil eng. tasks.

Recent publications on the Action's topics
- N. Diamanti, A.P. Annan, "Characterizing the energy distribution around GPR antennas", J. Applied Geophysics, 2013.
- N. Diamanti, J.D. Redman, "Field observations and numerical models of GPR response from vertical pavement cracks", J. Applied Geophysics, Vol. 81, pp. 106-116, 2012.
- N. Diamanti, A. Giannopoulos, "Employing ADI-FDTD subgrids for GPR numerical modelling and their application to study ring separation in brick masonry arch bridges", Near Surface Geophysics, Vol. 9, pp. 245-256, 2011.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1, 4.3-4.6).

Greece

KLISTHENIS DIMITRIADIS
Geophysicist (M.Sc.)
GEOSERVICE
35, Lykaiou St., 114 76 Athens, Greece
Phone.-Fax: +30 210 6469865
e-mail: workst@geoservice.gr

Biographical sketch
Born in Athens (1958) he finished his basic studies in Athens University as physicist. In 1983 in Paris, France he obtained the Master Degree of Sciences in Applied Geophysics and Geochemistry at the University of Pierre & Marie Curie – Jussieu PARIS VI. He has a strong field experience of more than 25 years in applied geophysics and geochemistry, in all today's existing Non Destructive methods based on physics together with a significant ability to adjust and apply these methods in complex field and real conditions on site. He started his career in 1988, working for the Greek Public Power Corporation SA in the domain of geothermal resources exploitation. In the years 1990 he has created the company GEOSERVICE and worked in the company until today. During his career as CEO of GEOSERVICE Company, he has carried out many projects in the area of civil engineering and especially in geophysics at national level, cooperating with major national and international companies in large public works in Greece. In the domain of cooperation with the Greek public sector, he was nominated as Consultant of the Greek Ministry of Environment and Public works in the domain of water management and water quality monitoring in Greece, related to the 2000/EC EU Directive standards. He was also the Consultant of the Greek Ministry of Agriculture in the standardization of the modern geophysical methods in the Greek prescriptions and application standards.

Main experience in the Action's topics
GPR applications to archaeology, cultural heritage diagnostics, geophysics.

Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
Leader of Project 4.4. WG Member (WG2: Projects 2.1, 2.3, 2.4; WG4: Projects 4.1, 4.3).

Greece

NIKOS ECONOMOU
Researcher in Geophysics
Technical Univ. of Crete, Dept. of Mineral Resources Engineering, Polytechnioupolis, Kounoupidiana, 73100 Chania, Crete, Greece
Phone: +30 28210 37677 Fax: +30 28210 20710
e-mail: neconom@mred.tuc.gr

Biographical sketch
Nikos Economou PhD from 1998 was a scientific cooperator and since 2003 he belongs to the permanent personnel at the Applied Geophysics Lab of the Mineral Resources Engineering Dept., where he teaches laboratory exercises. He is the author and co-author of 8 papers in international scientific journals, from which 3 were invited by the editors. He is also co-author of 25 papers related to international conferences. He has reviewed articles for Geophysics, Journal of Applied Geophysics, Journal of the Balkan Geophysical Society, Nondestructive Testing and Evaluation International, and Journal of Geophysics and Engineering. He is a Member of the organizing committee of the 13th International Conference of the Greek Geological Society which will be held in September 2013 at Chania, Crete. His main research interests are non-stationary signal processing, attenuation analysis of seismic and GPR data and the application of geophysical methods for both geotechnical and environmental problems.

Main experience in the Action's topics
- Development of GPR data signal processing algorithms.
- Use of GPR in civil, geotechnical and environmental engineering, and in archaeology.

Recent publications on the Action's topics
- Economou, N, and A, Vafidis, A., 2011, "Deterministic deconvolution for GPR data in t-f domain," Near Surface Geophysics, 9, no. 5, 427-433.
- Economou, N., and Vafidis, A., 2012, "GPR data time varying deconvolution by kurtosis maximization," Journal of Applied Geophysics, 81, 117-121.
- Economou, N., Vafidis A., Hamdan H., Kritikakis G., Andronikidis N., and Dimitriadis K., 2012, "Time varying deconvolution of GPR data in civil engineering," Nondestructive Testing and Evaluation International, 27, 3, 285-292.

Participation to other COST Actions
No.

Role in COST Action TU1208
Leader of Project 3.4. WG Member (WG3: Project 3.4).

Greece

GEORGE KRITIKAKIS
Researcher in Geophysics
Technical Univ. of Crete, Dept. of Mineral Resources Engineering, Polytechnioupolis, Kounoupidiana, 73100 Chania, Crete, Greece
Phone: +30 28210 37670 Fax: +30 28210 20710
e-mail: gkritik@mred.tuc.gr

Biographical sketch
George Kritikakis received A B.Sc. in Mineral Resources Engineering from the Technical University of Crete in 2000. In 2001 and 2010 he received from the same institute M.Sc. and Ph.D., respectively, related to the development of algorithms for surface waves data inversion and their applications to geotechnical and environmental problems. After 2000, he was a scientific cooperator and since 2006 he belongs to the permanent personnel at the Applied Geophysics Lab of the Mineral Resources Engineering Dept., where he teaches laboratory exercises for the courses related to 1) seismics and 2) near surface geophysical methods (Electromagnetics, GPR, Electrical sounding, Magnetics, and Gravity). He is the author and co-author of 5 papers in international and 2 in domestic scientific journals. He is also author or co-author of 19 papers in international conferences. He is a Member of the organizing committee of the 13th International Conference of the Greek Geological Society which will be held in September 2013 at Chania, Crete. His main research interests are the development of inversion techniques and the application of geophysical methods for both geotechnical and environmental problems.

Main experience in the Action's topics
- Development of GPR data signal processing algorithms.
- Application of Ground Penetrating Radar in civil engineering and archaeometry as well as geotechnical and environmental applications.

Recent publications on the Action's topics
- Economou, N., Vafidis A., Hamdan H., Kritikakis G., Andronikidis N., and Dimitriadis K., 2012, Time varying deconvolution of GPR data in civil engineering, Nondestructive Testing and Evaluation International, 27, 3, 285-292

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.4).

Greece

ANDREAS LOIZOS
Professor and Director, Laboratory of Pavement Engineering
National Technical University of Athens (NTUA)
Phone: +30 210 7721341 - Fax: +30 2107724254
e-mail: aloizos@central.ntua.gr

Biographical sketch
Dr. Andreas Loizos is Full Professor of Pavement Engineering at the Dpt. of Transportation Planning and Engineering at the School of Civil Engineering and he is also the Director of the Laboratory of Highway (Pavement) Engineering of NTUA. His main interests include road and airfields pavement engineering, geophysical measurements in pavements, as well as aspects of railway track assessment. He has been involved in a numerous research programs at national and international level and he has been a member of several international committees and working groups concerning pavement issues among others ASTM, RILEM, ISAP, TRB, PIARC, ISSMGE and others. He is the RC (Research Coordinator) of Greece at the Forum of European National Highway Research Laboratories (FEHRL), in terms of the Greek FEHRL Group. At European level he has been involved in numerous European Union's Working Groups, COST Actions and FP7 projects.

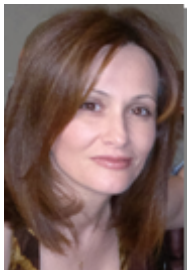
Main experience in the Action's topics
- Applications of GPR in civil engineering and GPR surveys of transport infrastructures and pavement.
- Applications of GPR in association with other non-destructive testing methods.

Recent publications on the Action's topics
- J.AppliedGeophysics, SI on "Ground Penetrating Radar for non-destructive evaluation of pavements, bridges and subsurface infrastructures", A. Benedetto, A. Loizos, L. Pajewski and E. Slob, Eds., 2013.
- Plati, C., Georgouli, K., Loizos, A., "Review of NDT assessment of road pavements using GPR", RILEM Bookseries 6 , pp. 855-860, 2012.

Participation to other COST Actions
- COST Action 354 "Performance Indicators for Road Pavements".
- COST Action 336 "Use of Falling Weight Deflectometers in Pavement Evaluation".
- COST Action 333 "Development of New Bituminous Pavement Design Method".
- COST Action 324 "Long-Term Performance of Road Pavement".

Role in COST Action TU1208
Vice Chair of the Action. WG Member (WG2: Projects 2.1-2.5; WG4: Project 4.2).

Greece



CHRISTINA PLATI
P.E., Lecturer
School of Civil Engineering
National Technical University of Athens (NTUA)
Phone: +30 210 7721363 Fax: +30 2107724254
e-mail: cplati@central.ntua.gr

Biographical sketch
Dr. Christina Plati received the Civil Engineer degree as well the Ph.D. degree in pavement engineering from National Technical University of Athens (NTUA) in Greece. She is Lecturer at the School of Civil Engineering of NTUA. She has been involved in several areas of pavement engineering sector for more than 14 years and her main research interests lie in Non Destructive Testing (NDT) techniques and analysis tools for pavement evaluation with a focus on geophysical methods. She has been a member of a numerous of scientific committees and working groups and involved in several European activities such as COST Action 354. Moreover, she has published more than 40 scientific papers in international journals and conferences.

Main experience in the Action's topics
- Applications of GPR in civil engineering.
- GPR surveys of transport infrastructures.
- Pavement evaluation.
- Applications of GPR in association with other non-destructive testing methods for assessing transportation infrastructure.

Recent publications on the Action's topics
- Plati, C., Loizos, A., "Estimation of in-situ density and moisture content in HMA pavements based on GPR trace reflection amplitude using different frequencies", Journal of Applied Geophysics (article in press)
- Plati, C., Georgouli, K., Loizos, A., "Review of NDT assessment of road pavements using GPR", RILEM Bookseries 6 , pp. 855-860, 2012.
- Plati, C., Loizos, A., "Using ground-penetrating radar for assessing the structural needs of asphalt pavements", Nondestructive Testing and Eval. Vol. 27 (3), pp. 273-284, 2012.

Participation to other COST Actions
COST Action 354 "Performance Indicators for Road Pavements".

Role in COST Action TU1208
WG2 Chair. WG Member (WG2: Projects 2.1-2.5; WG4: Project 4.2).

Greece

NIKOS SPANOUDAKIS
Researcher in Geophysics
Technical Univ. of Crete, Dept. of Mineral Resources
Engineering, Polytechnioupolis, Kounoupidiana, 73100
Chania, Crete, Greece
Phone: +30 28210 37052 Fax: +30 28210 20710
e-mail: nspanoud@mred.tuc.gr

Biographical sketch
Nikos Spanoudakis received A B.Sc. in Mineral Resources Engineering from the Technical University of Crete in 2000. In 2002 and 2007 he received from the same institute M.Sc. and Ph.D., respectively, related to the development of algorithms for Ground Penetrating Radar data processing and classification techniques and their applications to environmental problems. After 2002, he was a scientific cooperator and for the period 2006-2011 he belonged to the permanent personnel at the Applied Geophysics Lab of the Mineral Resources Engineering Dept., where he teached laboratory exercises for the courses related to GPR. From 2012 till today he is Head of Programming and Development Divisionat at the Special Account of Research Budgets Committee, Technical University of Crete. He is the author and co-author of 13 papers in international conferences. His main research interests are the development of GPR dta processing lagorithms and the application of GPR for both geotechnical and environmental problems.

Main experience in the Action's topics
- Development of GPR data signal processing algorithms.
- Application of Ground Penetrating Radar in civil engineering and archaeometry as well as geotechnical and environmental applications.

Recent publications on the Action's topics
- N. Spanoudakis, M. Manataki, V. Niniou Kindeli, A.P. Vafidis (2011). GPR imaging at Aptera archaeological site. 6th congress of Balkan Geophysical Society. 3-6 October 2011, Budapest.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.4).

Greece

ANTONIS VAFIDIS
Professor
Technical Univ. of Crete, Dept. of Mineral Resources Engineering, Polytechnioupolis, Kounoupidiana, 73100 Chania, Crete, Greece
Phone: +30 28210 37677 Fax: +30 28210 20710
e-mail: vafidis@mred.tuc.gr

Biographical sketch
Dr. Antonis Vafidis is Professor of Geophysics and Director of the Applied Geophysics Laboratory, TUC, since 1988. He received a B.Sc. in Physics (1981) from the University of Thessaloniki, a M.Sc. in Applied Geophysics (1984) from McGill University, Montreal, Canada, and a Ph.D. in Geophysics (1988) from University of Alberta, Canada. He has worked as an Assistant Professor at TUC from 1988 to 1997 and as Associate Professor from 1997 to 2003, as well as a Visiting Professor at the University of Alberta. He was the Head of the Mineral Resources Engineering Department, of the Technical University of Crete from 2007 to 2010. He is the author and the co-author of 55 papers and 75 papers in conference proceedings. He is Editor of the Journal of the Balkan Geophysical Society since 2006. He is the secretary of the organizing committee of the 13th International Conference of the Greek Geological Society which will be held in September 2013 at Chania, Crete. He is currently the coordinator of the project 'GEOCHARACTERIZATION' (the application of geophysical methods in geotechnical problems) and the 'project' CLEARWATER (development of joint inversion methods for geophysical imaging seawater intrusion in coastal aquifers). He is a member of SEG, EAGE and BGS.

Main experience in the Action's topics
- Development of signal processing algorithms.
- Application of GPR in civil and environmental engineering, archaeometry, geotechnics.

Recent publications on the Action's topics
- Economou, N, and A, Vafidis, A., 2011, Deterministic deconvolution for GPR data in t-f domain, Near Surface Geophysics, 9, no. 5, 427-433.
- Economou, N., and Vafidis, A., 2012, GPR data time varying deconvolution by kurtosis maximization, Journal of Applied Geophysics, 81, 117-121.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.4).

YANNIS KONSTANTAKIS
GEOSERVICE, Athens, Greece
e-mail: vallaoras@yahoo.com

Role in COST Action TU1208
Leader of Project 4.3. WG Member (WG2: Projects 2.1, 2.4; WG4: Projects 4.1, 4.3).

MICHAEL STYLLAS
GEOSERVICE, Athens, Greece
e-mail: mstyllas@gmail.com

Role in COST Action TU1208
WG Associate Member (WG2; WG4).

DIMITRIOS XIROUCHAKIS
GEOTERRA, Athens, Greece
e-mail: dxirouch@gmail.com

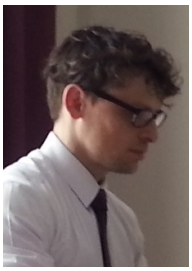
Role in COST Action TU1208
WG Associate Member (WG4).

WALLACE WAI-LOK LAI
The Hong Kong Polytechnic University
e-mail: wallace.wai.lok.lai@polyu.edu.hk

Role in COST Action TU1208
MC Observer from IPC. WG Member (WG3: Projects 3.1-3.4).

Ireland

PATRIZIO SIMEONI
Senior technical engineer
Railway Procurent Agency [RPA]
National Transport Authority [NTA]
Dún Scéine, Iveagh Court Harcourt Lane - Dublin.
tel.: +353 (0)1 879 8375
e-mail: patrizio.simeoni@nationaltransport.ie
patrizio.simeoni@rpa.ie



Biographical sketch
Patrizio Simeoni received *Laurea* (Master) degree in Electronic Engineering from "La Sapienza" University of Rome, Italy, in Academic Year 2001 and he is actually a Ph.D. student in Electromagnetics in the same University. He mainly worked as embedded and system engineer, in military and civile environments. As a software engineer he developed firmwares on DSPs and Controllers, Device Drivers and user level application, as a system engineer he designed solution for telecommunication projects mainly in military environment. Actually employed in the Railway Procurement Agency and working as senior technical engineer in the National Transport Autority, he is responsible for technical solutions in the Integrated Ticketing System project. He frequented ESoA courses on Antenna measurement and Leaky wave antennas.

Main experience in the Action's topics
Electromagnetic wave penetration and reflection in lossy media.

Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (WG3: Project 3.1).

GIUSEPPE RUVIO
The Telecommunications Research Centre (CTVR), The Trinity College, Dublin, Ireland
e-mail: giuseppe.ruvio@dit.ie

Role in COST Action TU1208
MC Member. WG Member (WG3: Project 3.2).

Israel

MOTTI HARIDIM

Researcher in the fields of Antennas, Radiation and RF Communications, Faculty of Engineering, HIT-Holon Institute of Technology,
Golmob 52, Holon, Israel
Phone: +972 528 798365, Fax: + 97235026688
e-mail: mharidim@hit.ac.il

Biographical sketch

Prof. Haridim received his PhD in electronic and electrical engineering from Technion-Israel Institute of Technology, Haifa Israel, in 1992. His research interests include the areas of antennas, dosimetry and SAR reduction methods and radio communication. He is the author/ co-author of more than 100 publications in scientific conference proceedings, articles, and chapters in international books. He is a co-founder and Head of the technologies and Engineering aspects of radiation in "TNUDA"- the Israeli National Information Center for Non-Ionizing Radiation.

Main experience in the Action's topics

Development of antennas and wireless communication system for underground channels.

Recent publications on the Action's topics

NA.

Participation to other COST Actions

COST Action IC1102, VISTA- Versatile, Integrated, and Signal-aware Technologies for Antennas (MC Member). COST Action IC1301, WIPE- Wireless Power Transmission for Sustainable Electronics (MC Member).

Role in COST Action TU1208

MC Member. WG Member (WG1: Project 1.2).

Italy

MICHELE AMBROSIANO
Ph.D. Student in Signal & Image Processing
University of Napoli "Parthenope" - Department of Engineering Centro direzionale di Napoli, Isola C4, 80143, Napoli, Italy
Phone: +39 081 5476794
e-mail: michele.ambrosanio@uniparthenope.it

Biographical sketch
Michele Ambrosanio received both BS and MS degrees in Biomedical Engineering (summa cum laude) from University of Napoli "Federico II", Italy, and he is now attending the second year of Ph.D. in Information Engineering at University of Napoli "Parthenope". His main research interests are in the field of electromagnetic forward- and inverse-scattering problems, Ground Penetrating Radar and its applications, Synthetic Aperture Radar signal processing and Magnetic Resonance Imaging. He is a member of the Institute of Electrical and Electronics Engineers (IEEE) and of CNIT (Consortio Nazionale Interuniversitario per le Telecomunicazioni).

Main experience in the Action's topics
- Development of methods for the solution of electromagnetic forward- and inverse-scattering problems by two-dimensional and three-dimensional buried structures.
- Development of method based on Compressive Sensing for the solution of electromagnetic inverse scattering problems by two-dimensional and three-dimensional structures.
- Improvement of GPR performances by using Compressive Sampling.
- Development of 3D millimetric focusing algorithms.

Recent publications on the Action's topics
- Ambrosanio M., Autieri R., Pascazio V., "A compressive sensing based approach for microwave tomography and GPR applications", IGARSS 2014, Québec city, Canada.
- Ambrosanio M., Schirinzi Gilda, "A millimetric wave image focusing for near-field cylindrical scanning systems", EuRAD 2014, Rome, Italy.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Projects 3.1-3.4; WG4 (Projects 4.1-4.6).

Italy

ROBERTA AUTIERI
Research Fellow in Signal Processing
Università degli Studi di Napoli
"Parthenope" - Department of Engineering
Centro Direzionale Isola C4, 80143 Naples, Italy
Phone: +39 081 5476794
Fax: +39 081 5476777
e-mail: roberta.autieri@uniparthenope.it

Biographical sketch
Roberta Autieri received the Laurea degree in Telecommunication Engineering from "Federico II" University of Naples, Italy, and the Doctorate in Information Engineering from "Parthenope" University of Naples. She is a Research Fellow. She is the author/co-author of 13 works on international journals and conference proceedings. Her main research interests are in electromagnetic inverse-scattering problems, Compressive Sensing and its applications to Ground Penetrating Radar, MAP estimation, Markov random fields.

Main experience in the Action's topics
- Development of method based on Compressive Sensing for the solution of electromagnetic inverse scattering problems by two-dimensional structures.
- Applications of Compressive Sensing to Ground Penetrating Radar.
- Development of numerical techniques for the solution of electromagnetic inverse scattering problems by two-dimensional and three- dimensional structures based on MAP estimation.

Recent publications on the Action's topics
- R. Autieri, M. D'Urso, T. Isernia and V. Pascazio, "Inverse Pro_ling via an E_ective Lin-earized Scattering Model and MRF Regularization", IEEE Geoscience and Remote Sensing Letters, vol. 8, no. 6, pp. 1021-1025, November 2011.
- R. Autieri, G. Ferraiuolo and V. Pascazio, "Bayesian Regularization in non-linear imaging: reconstructions from experimental data in microwave tomography", IEEE Transactions on Geoscience and Remote Sensing, vol. 49, no. 2, pp. 801-813, February 2011.
- M. Ambrosanio, R. Autieri, V. Pascazio, "A Compressive Sensing based approach for Microwave Tomography and GPR applications", submitted on IEEE International Geoscience and Remote Sensing Symposium, IGARSS 2014.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1-4.6).

Italy

FABIO BASELICE
Postdoctoral Researcher in Signal & Image Processing University of Napoli
"Parthenope" - Department of Engineering
Centro Direzionale Isola C4, 80143, Napoli, Italy
Phone: +39 081 5476769
e-mail: fabio.baselice@uniparthenope.it

Biographical sketch
Fabio Baselice was born in Castellammare di Stabia, Italy, in 1982. He received the B.S. and M.S. degrees (summa cum laude) in telecommunications engineering and the Ph.D. degree in Information Engineering from the University of Napoli "Parthenope", Napoli, Italy, in 2004, 2007 and 2010, respectively. In 2007, he was a Visiting Student with the Département Traitement du Signal et des Images, Télécom ParisTech, Paris, France. In 2010, he was a visiting Scientist with the Vision Laboratory, Department of Physics, University of Antwerp, Antwerp, Belgium. In 2011 and 2012, he was a Postdoctoral Researcher with Consortio Nazionale Interuniversitario per le Telecomunicazioni. He is currently a Postdoctoral Researcher with the University of Napoli "Parthenope". He is the author of more than 24 scientific papers published in international journals and in conference proceedings. His main research interests deal with statistical signal and image processing, radar systems, synthetic aperture radar interferometry and magnetic resonance imaging.

Main experience in the Action's topics
- Development of advanced SAR and InSAR data processing techniques
- Development of methods for the statistical image processing of Magnetic Resonance Imaging signal
- Development of 3D focusing algorithms for radar applications

Recent publications on the Action's topics
- jF. Baselice, G. Ferraioli and V. Pascazio, "Markovian change detection of urban areas using very high resolution complex SAR images", IEEE Geoscience and Remote Sensing Letters, vol. 11, no. 5, 2014.
- F. Baselice, G. Ferraioli and D. Reale, "Edge detection using real and imaginary decomposition of SAR data", IEEE Trans. on Geoscience and Remote Sensing, 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1-4.6).

Italy

ANDREA BENEDETTO
Associate Professor
"Roma Tre" University
Via Vito Volterra 62, 00146 Rome, Italy
Phone: +39 06 57333453 Fax: +39 06 57333441
e-mail: andrea.benedetto@uniroma3.it

Biographical sketch

Andrea Benedetto from 2004 is Associate Professor of (1) roads, railways, and airports, (2) infrastructure, natural hazards and road safety and (3) statistics for transportation at the University of Roma Tre. His research interests are in the fields of infrastructures construction, maintenance and management. He is the author of more than 120 papers and he served also as Chairman of the Pavement and Concrete sessions at several International Conferences and Workshops on GPR. He is convener and chairman at the session on the applications of GPR in civil engineering at several General Assemblies of EGU. He founded and served as General Chairman from 2007 at the Intl. Conf. on Road Safety and Simulation, he is general Chairman of the Permanent Steering Committee of RSS. He is Editor in Chief of "Advances in Transportation Studies an international Journal" and member of several Panels of Journals as associate editor, member of editorial board or referee.

Main experience in the Action's topics

- GPR applications to pavement (layer thickness, damage detection) and bridge decks.
- Evaluation of moisture and road material characteristics by GPR.
- GPR and LFWD integration for evaluation of mechanical characteristics of materials.

Recent publications on the Action's topics

- Benedetto, A., Manacorda, G., Simi, A., Tosti, F. Novel perspectives in bridges inspection using GPR. 2012, Nondestructive Testing and Evaluation 27 (3), pp. 239-251.
- Benedetto, A., Benedetto, F., Tosti, F. GPR applications for geotechnical stability of transportation infrastructures 2012, Nondestructive Test. and Eval. 27(3), 253-262.
- C. Patriarca, F. Tosti, C. Velds, A. Benedetto, S. Lambot, E. Slob, "Frequency Dependent Electric Properties of Homogeneous Multi-phase Lossy Media in the Ground-Penetrating Radar Frequency Range," J. Applied Geophysics, 2013.
- A. Benedetto, L. Pajewski, Eds., "Civil Engineering Applications of Ground Penetrating Radar," Springer, April 2015, ISBN 978-3- 319-04812-3.

Participation to other COST Actions

No.

Role in COST Action TU1208

Editorial Coordinator of the Action. MC Subst.Member. WG Member (WG2: Projects 2.1-2.5).

Italy

FRANCESCO BENEDETTO
PhD Assistant Professor of Telecommunications
"Roma Tre" University
Via Vito Volterra 62, 00146 Rome, Italy
Phone: +39 06 57337079 Fax: +39 06 57337026
e-mail: francesco.benedetto@uniroma3.it

Biographical sketch
The research interests of Francesco Benedetto are in the field of digital signal and image processing in telecommunications, code acquisition and synchronization for the 3G mobile communication systems and multimedia communication. In particular, he has published numerous research articles on multimedia communications and video coding, ground penetrating radar (GPR) signal processing, spread-spectrum code synchronization for 3G communication systems and satellite systems (GPS and GALILEO), correlation estimation and spectral analysis. He is the Associate Editor (area: Wireless Signal Processing and Traffic Engineering) of the Int. J. of Mobile Network Design and Innovation. He is the Guest Editor of the Special Issue of the Journal of Recent Patents on Computer Science on "Recent Advances in Cognitive Radio Communications". Since 2010, He is an Editor for the ISRN Communications and Networking, one of the International Scholarly Research Network Series of Journals of the Hindawi Publishing Corporation.

Main experience in the Action's topics
- GPR signal and image processing for road management and soil interpretation.
- Signal Processing Technique for Pavement Damages Detection & Classification by GPR.
- Remote Sensing of Soil Moisture by GPR Signal Processing in the Frequency Domain.
- GPR application for geotechnical stability of transportation infrastructure.

Recent publications on the Action's topics
- F. Benedetto, F. Tosti, "GPR Spectral Analysis for Clay Content Evaluation by the Frequency Shift Method", Journal of Applied Geophysics, 2013.
- A. Benedetto, F. Benedetto, "Application Field Specific Synthesizing of Sensing Technology: Civil Engineering Application of Ground Penetrating Radar Sensing Technology", in "Comprehensive Material Processing Technology", Saleem Hashmi editor, Elsevier Publisher, 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
Leader of Project 3.4. WG Member (WG3: Project 3.4).

Italy

LORENZO CAPINERI
Associate Professor
Department of Information Engineering
via Santa Marta, 3 50139 Firenze, Italy
Phone.: +39554796376
e-mail: lorenzo.capineri@unifi.it

Biographical sketch

He was awarded his degree in electronic engineering in 1988, his doctorate in non-destructive Testing in 1993 and post doctorate in 1994. In 1995 he became Associate Researcher and in 2004 Associate Professor of Electronics in the Dept. of Information Engineering. His research activities are in the design of ultrasonic guided waves devices, buried objects detection with GPR and holographic radar. He worked on several research projects in collaboration with national industries, the Italian Research Council, the Italian Space Agency and the European Space Agency, AEA Technology and UKAEA (England), ISTC (International Science and Technology Centre, Moscow, Russia) and NATO. He is coauthor of 6 Italian patents, coauthor of 3 book chapters and 120 scientific and technical papers. He is IEEE Senior Member since 2007 and Member since 1983. Co-Chair of IWAGPR2015 conference and Member of Scientific Committees of GPR, PIERS and IGARSS conferences.

Main experience in the Action's topics

- Electronic design of Holographic Radar and Prototyping of GPR systems.
- GPR/Ultrasound robotic scanner for pavements and subsurface survey.
- Signal and image processing of GPR data for underground services.

Recent publications on the Action's topics

- S. Ivashov, V.V. Razevig, I.A. Vasiliev,A.V. Zhuravlev, T.D. Bechtel, L. Capineri, "Holographic Subsurface Radar Of Rascan Type: Development And Applications", Ieee Journal Of Selected Topics In Earth Observations And Remote Sensing, Ieee Journal Of Selected Topics In Applied Earth Observations And Remote Sensing, Vol. 4, No. 4, December 2011.
- C.G. Windsor, L. Capineri, P. Falorni "A Data Pair-Labelled Generalised Hough Transform For Radar Location Of Buried Objects", Feb 2013, Ieee Grs Letters, Geoscience And Remote Sensing Letters, Ieee (Volume11, N.1, Issue: 99).

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Associate Member (WG1).

Italy

ILARIA CATAPANO
Researcher in Electromagnetics
CNR - National Research Council of Italy
IREA - Institute for EM Sensing of the Environment
via Diocleziano 328, 80124 Napoli, Italy
Phone: +39 081 7620645 Fax: +39 081 5705734
e-mail: catapano.i@irea.cnr.it

Biographical sketch
Ilaria Catapano (Research Scientist at CNR, level III) received PhD degree in Electric and Information Engineering from the University of Cassino, Italy, in 2006. In 2003 she started her research activity at the IREA-CNR. Her scientific interest mainly concerns non-invasive electromagnetic diagnostics, development and performance assessment of microwave imaging approaches, sub-surface radar systems. She has co-authored more than 70 papers, mainly on scientific journals or proceedings of international conferences and she is a reviewer for several international journals and conference. She is Member of the IEEE. She received the G. Barzilai Award by the Italian Electromagnetic Society (SIEM) in 2004 and was one of the Young Scientist Awardees at the XXIX URSI General Assembly in 2008. She was adjunct Professor at the Mediterranea University of Reggio Calabria, Italy, in 2010 and invited lecturer at São Paulo University, Brazil, in 2013.

Main experience in the Action's topics
- Development of models and effective approaches for electromagnetic forward scattering.
- Development and experimental assessment of inverse scattering approaches using complete and/or aspect limited data.
- Approaches for processing data gathered by means non-conventional GPR systems.
- Processing of experimental GPR data gathered in different applicative contexts by means of dedicated commercial software and in house developed tomographic approaches.

Recent publications on the Action's topics
- Soldovieri F., Catapano I., Barone P.M., Lauro S.E., Mattei E., Pettinelli E., Valerio G., Comite D., Galli A., "Gpr estimation of the geometrical features of buried metallic targets in testing conditions", (2013) Progress In Electromagnetics Research B, (49), 339-362.
- Crocco L., Di Donato L., Catapano I., Isernia T., "An improved simple method for imaging the shape of complex targets", (2013) IEEE Trans. Antennas and Prop., 61 (2), 843-851.

Participation to other COST Actions
No.

Role in COST Action TU1208
Leader of Project 3.2. WG Member (WG2: Projects 2.2, 2.3, 2.5; WG3: Projects 3.1, 3.2).

Italy

LORENZO CROCCO
Research Scientist
National Research Council of Italy – CNR
Institute for EM Sensing of the Environment – IREA
via Diocleziano 328, Naples, Italy
Phone: +39 081 7620646 Fax: +39 081 5705734
e-mail: crocco.l@irea.cnr.it

Biographical sketch

Lorenzo Crocco Ph.D. has been a Research Scientist since 2001 at the CNR-IREA. In 2009–2011, he was an Adjunct Professor at the Mediterranea University of Reggio Calabria (Italy), he is a member of the Board of Ph.D. advisors. The interests of Lorenzo Crocco include noninvasive diagnostics, inverse problems, EM scattering problems, GPR imaging, microwave biomedical imaging and therapeutic uses of EM fields. With respect to these topics, he has published more than 60 papers on peer reviewed journals, given keynote talks at conferences and lead research projects. Dr. Crocco has served as Guest Editor for several journals and is currently member of the Editorial Board of the International Journal of Antennas and Propagation (IJAP). He has co-chaired the IWAGPR2007 workshop and the XIII International Conference on GPR, 2010. He is a Fellow of The Electromagnetics Academy (TEA) and a Senior Member of the IEEE.

Main experience in the Action's topics

- Development of inverse scattering approaches in 2D and 3D geometry.
- Development of adaptive quantitative imaging methods exploiting truncated wavelet decomposition as regularization tool.
- Development of non-iterative inversion methods for quantitative microwave imaging.
- Application of tomographic imaging and advanced modeling tools to GPR surveys.

Recent publications on the Action's topics

- L Crocco, I Catapano, L Di Donato, T Isernia, "The linear sampling method as a way to quantitative inverse scattering", IEEE Trans. Antennas Prop., 60 (4), 1844-1853, 2012.
- J. van der Kruk, E. Slob, L. Crocco, GPR imaging and inversion for hydrogeophysical and subsurface property estimation, SI, Near Surface Geophysics, 11(2), 115-116, 2013.

Participation to other COST Actions

No.

Role Role in COST Action TU1208

Leader of Project 4.2. WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1, 4.2, 4.6).

Italy

FABRIZIO D'AMICO
Technician, PhD engineer.
"Roma Tre" University – Department of Enginnering
Via Vito Volterra 62, 00146 Rome, Italy
Phone: +39 06 57333412 Fax: +39 06 57333441
e-mail: fabrizio.damico@uniroma3.it

Biographical sketch
Mr. Fabrizio D'Amico is PhD in Sciences of Civil Engineering. Having served as a researcher, in recent years he is engaged as a teacher of Road design in urban areas in Civil Engineering Department at Roma Tre University. From 2005 and for several years he taught "Environmental Impact Assessment of Transportation Systems" in the Master "Economics & Engineering for Environmental protection" at Roma Tre University. He is member of the Scientific Committee of CRISS (Inter-University Research Centre of Road Safety. He was directly involved in several research projects in order to establish how, starting from a detailed knowledge of the different types of degradation, and through the help of advanced algorithms and ground penetrating radar (GPR) signal processing, it is possible to indicate the levels of insecurity in the road that can be achieved in coming periods, depending on time of degradation. He has published numerous research articles based on ground penetrating radar (GPR) signal processing.

Main experience in the Action's topics
- GPR signal and image processing for road management and soil interpretation.
- GPR application for geotechnical stability of transportation infrastructure.
- Measurement of Soil Moisture by GPR Signal Processing in the Frequency Domain.

Recent publications on the Action's topics
- A. Benedetto, F. D'Amico, C. Guattari – "GPR Signal processing in frequency domain using Artificial Neural Network for water content prediction in unsaturated subgrade" - GPR2010 – XIII International Conference on GPR, June 2010, Lecce (Italy).
- A. Benedetto, F. D'Amico, F. Tosti – "GPR-based evaluation of strength properties of unbound pavement material from electrical characteristics" - Vol. 15, EGU2013-3648, EGU General Assembly 2013, Vienna (Austria).

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Project 2.5; WG4: Project 4.3).

Italy

MARIA ROSARIA DE BLASIIS
PhD Full Professor of Roads, Railroads and Airports
Dept. Engineering - "Roma Tre" University
via Volterra 62, 00146 Rome, Italy
Phone: +39 06 57333443 Fax: +39 06 57333441
e-mail: mariarosaria.deblasiis@uniroma3.it

Biographical sketch
The research interests of Maria Rosaria De Blasiis regard the environmental aspects of infrastructures, the project management for safety, the road pavement materials and design; geotechnical aspects of road and railroad embankments, pavement technologies with special attention to the rehabilitation. She has been studying the application of advanced methods and technologies for the infrastructures analysis. She presented an original model to analyze project alternatives in environmental impact assessment at the 6th European Forum on Cost Engineering. The calibration of the model allowed she to be in charged by the European Community DG VII for the study of the procedures for the SEA She developed high profile studies in work teams of specific programs financed by public agencies and corporate. Since 2008 she has been Director of the CRISS Inter-universities Research Centre for Road Safety. Member of The World Road Association-PIARC – Committee C.1.3: Climate Change and Sustainability; Member of editorial board "Advanced in transportation studies. An international journal". Member of the valuation Committee of research programs for the Italian-French University and the Italian National Research Council (CNR). Prof. Maria Rosaria De Blasiis is an "Expert Consultant" of the Ministry of Public Works.

Main experience in the Action's topics
- Signal Processing Technique for Pavement Damages Detection & Classification by GPR.
- GPR application for geotechnical stability of transportation infrastructure.

Recent publications on the Action's topics
- Benedetto A., De Blasiis M.R. Applications of Ground Penetrating Radar to road pavement: state of the art and novelties. Proc. 2nd GeoShanghai International Conference, Shanghai, China 2010.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Project 2.5; WG4: Project 4.3).

Italy

LORETO DI DONATO

Assistant Professor (Electromagnetic Fields)
University of Catania - Department of Electric,
Electronics and Computer Engineering
viale A. Doria 6, 95126 Catania, Italy
Phone.: +39 0957382383 - Fax: +39 0957382397
e-mail: loreto.didonato@dieei.unict.it

Biographical sketch

Loreto Di Donato received the B.S. and M.S. Laurea degree in Biomedical Engineering from the University of Naples "Federico II" (Italy) in 2006 and 2008, respectively. In 2008, he joined the Electromagnetic Diagnostic Research Group at the Institute for Electromagnetic Sensing of the Environment - National Research Council (IREA-CNR) of Italy in Naples, as a research assistant and, in 2009, he joined the LEMMA Group at the University "Mediterranea" of Reggio di Calabria as a Ph. D. student. Since 2013 he is with DIEEI as Assistant Professor of Electromagnetic Fields at the University of Catania (Italy). Loreto Di Donato was a Young Scientist at the XXXIII International Conference on Ground Penetrating Radar, Young Scientist Awarded at the XXX URSI General Assembly in 2011, and, in 2012, he received an honorable mention from the IEEE in a Student Member best paper competition. He is member of the National Interuniversity Consortium for Telecommunications (CNIT), Italian Society of Electromagnetics (SIEM), associate member of the National Institute of Nuclear Physics. He is author of more than 50 scientific contributions on ISI journals and at international conferences.

Main experience in the Action's topics

- Electromagnetic forward and inverse scattering problems of interest in GPR applications.
- Detection and geometrical characterization and of buried structures.
- Design of imaging approaches for electromagnetic characterization of surveyed area.

Recent publications on the Action's topics

- L. Crocco, L. Di Donato, G. Sorbello, New Tomographic Imaging Strategies for GPR Surveys, accepted for the XV International Conference on Ground Penetrating Radar.
- L. Di Donato, R. Scapaticci, T. Isernia, I. Catapano, and L. Crocco, An effective method for borehole imaging of buried tunnels, Int. J. Antenn. Propag., vol. 2012.
- Catapano I., Crocco L., Soldovieri F., Di Donato L., Persico R., Utilities Mapping via Linear Sampling Method, XIV International Conference on GPR, Shanghai, 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1, 4.2).

Italy

MAURIZIO ERCOLI
PhD in Applied Geophysics
Università di Perugia, Dip. di Fisica e Geologia
Via Alessandro Pascoli, s.n.c. 06123 Perugia, Italy.
Phone.: +39 075 5867176 - Fax: +39 075 5867167
e-mail: maurizio.ercoli@gmail.com

Biographical sketch

Maurizio Ercoli received the Laurea degree in Resources and Geological Risks (score 110/110 with honors) at the "Università di Perugia" (Italy) and he took the title of Doctor of Philosophy in Earth Science and Geotechnology from "Università di Perugia" (2011, Italy). In September 2013, he was at the Department of Geociences at the University of Calgary (Canada) as a "Visiting Researcher. He has currently a research grant at the Dipartimento di Fisica e Geologia "Università di Perugia" and he is an active member of the Geophysical Group belonging to the "Laboratory of Applied Geology and Geophysics" of the University. He is the author/co-author of about 20 works on international books, journals and conference proceedings. He is a reviewer of NDT & E International. His main research interests are in GPR technique and its applications, in particular 3D-high resolution imaging, GPR-GNSS integration, faults detection (paleoseismology) and fractures characterizations, archaeology, civil engineering, cultural heritage conservation, data-processing and seismic attribute analysis.

Main experience in the Action's topics

- 3D-high resolution imaging of buried two-dimensional and three-dimensional structures.
- Common offset, multi-fold data processing and velocity analysis.
- Applications of GPR in civil engineering and cultural heritage conservation.

Recent publications on the Action's topics

- M. Ercoli, C. Pauselli, A. Frigeri, E. Forte, C. Federico, (2014) "3-D GPR data analysis for high resolution imaging of shallow subsurface faults: the Mt. Vettore case study (Central Apennines, Italy)". In: Geophysical Journal International - (GJI), 198:1(609-621).
- M. Ercoli, C. Pauselli, A. Frigeri, E. Forte and C. Federico, "Geophysical paleoseismology" through high resolution GPR data: A case of shallow faulting imaging in Central Italy. (2013). In: Journal of Applied Geophysics, 90 (27-40).

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG2: Projects 2.2-2.3-2.4; WG4: Projects 4.1, 4.4, 4.5).

Italy

COSTANZO FEDERICO

Geophysics Professor
Università di Perugia, Dip. di Fisica e Geologia
Via Alessandro Pascoli, s.n.c. 06123 Perugia (PG), Italy.
Phone.: +39 075 5867179
Fax: +39 075 5867167
e-mail: costanzo.federico@unipg.it

Biographical sketch

Costanzo Federico is Associate Professor of Physics of Earth. His research is focused on various topics and in recent years, in the study of the thermal evolution of the Apennines, the thermal evolution of planetary objects such as asteroids and finally to geophysical prospecting by GPR identify and characterize buried recent faults and the high-resolution of the stratification of the subsoil. He brought forward a number of both nationally and internationally collaborations with qualified research agencies such as NASA, ESA, INAF, ASI. In particular, he is responsible for processing of geophysical data and the development of numerical models acts to the interpretation of the data. In particular, he conducted studies on the data from the planet Mars (Sharad data).

Main experience in the Action's topics

- Common offset, multi-fold data processing and velocity analysis.
- Applications of GPR in civil engineering and cultural heritage conservation.

Recent publications on the Action's topics

- M. Ercoli, C. Pauselli, A. Frigeri, E. Forte, C. Federico, (2014) "3-D GPR data analysis for high resolution imaging of shallow subsurface faults: the Mt. Vettore case study (Central Apennines, Italy)". In: Geophysical Journal International - (GJI), 198:1(609-621).
- M. Ercoli, C. Pauselli, A. Frigeri, E. Forte and C. Federico, "Geophysical paleoseismology" through high resolution GPR data: A case of shallow faulting imaging in Central Italy. (2013). In: Journal of Applied Geophysics, 90(27-40).
- M. Ercoli, C. Pauselli, C. Federico, A. Frigeri and E. Forte, "3D GPR imaging for paleoseismology in Central Appennines (Italy), (2012). Extended Abstract of 14th International Conference on Ground Penetrating Radar (GPR). 4-8 June, 2012. Shanghai, China, pp. 937-942.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG2: Projects 2.2-2.3-2.4; WG4: Projects 4.1, 4.4, 4.5).

GIAMPAOLO FERRAIOLI
Assistant Professor in Telecommunications
University of Napoli
"Parthenope" - Department of Engineering
Centro Direzionale Isola C4, 80143, Napoli, Italy
Phone :+39 081 5476769
e-mail: giampaolo.ferraioli@uniparthenope.it

Biographical sketch
Giampaolo Ferraioli was born in Lagonegro, Italy, in 1982. He received the B.S. and M.S. degrees (summa cum laude) and the Ph.D. degree in telecommunications engineering from the University of Napoli "Parthenope", Italy, in 2003, 2005 and 2008, respectively. He was a Visiting Student (2008) and a Visiting Scientist (2009-2011) with Département Traitement du Signal et des Images, Télécom ParisTech, Paris, France. In 2009, he was a Postdoctoral Researcher with University of Basilicata, Potenza, Italy. He is currently an Assistant Professor with the University of Napoli "Parthenope". He is author of more than 30 scientific papers published in international journals and in conference proceedings. His main scientific interests deal with statistical signal and image processing, radar systems, synthetic aperture radar interferometry and magnetic resonance imaging. Dr. Ferraioli was the recipient of the "IEEE 2009 Best European Ph.D. Thesis in Remote Sensing" prize, sponsored by IEEE Geoscience and Remote Sensing Society.

Main experience in the Action's topics
- Development of advanced SAR and InSAR data processing techniques, methods for the statistical image processing of Magnetic Resonance Imaging signal, 3D focusing algorithms for radar applications.

Recent publications on the Action's topics
- F. Baselice, G. Ferraioli and V. Pascazio, "Markovian change detection of urban areas using very high resolution complex SAR images", IEEE Geoscience and Remote Sensing Letters, vol. 11, no. 5, 2014.
- F. Baselice and G. Ferraioli, "Unsupervised coastal line extraction from SAR images", IEEE Geoscience and Remote Sensing Letters, vol. 10, no. 46, November 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
Participant of WG3 (Projects 3.1-3.6) and WG4 (Projects 4.1-4.6).

Italy

VINCENZO FERRARA
Associate Professor in Electronics
"La Sapienza" University of Rome – Dept. of Information Engineering, Electronics and Telecommunications
via Eudossiana 18, 00184 Rome, Italy
Phone: +39 06 44585833 - Fax: +39 06 44585918
e-mail: vincenzo.ferrara@uniroma1.it

Biographical sketch
Vincenzo Ferrara received the "Laurea" degree cum laude in Electronic Engineering in March 1980 from "Sapienza" University of Rome. He joined the Department of Electronic Engineering of the same University, first as Researcher from 1989 to 2001 and then as Associate Professor of Electronic since 2001.
The scientific research conducted in the years after graduation can be divided into four topics: electronic systems for the environment, design of RF circuits, LCD, porous silicon.
Founding member of the interdisciplinary laboratory "Remote Sensing Applications and Metodologies (RESAM) Laboratory" of the Faculty of Engineering – Sapienza University of Rome. Member of the editorial board of the "International journal of Sustainable Development and Planning". Member of international scientific advisory committee of many conferences about the topics: Risk analysis, Sustainable Planning & Development, Brownfield, Disaster Management .

Main experience in the Action's topics
- Development of numerical techniques for detection of objects by remote sensing.
- Applications of Ground Penetrating Radar.
- Measurement of EM fields emitted by an equipment, for radiation protection.

Recent publications on the Action's topics
- V. Ferrara, "Smart Objects and Wireless Sensor Networks for Monitoring: sustainable technology in disaster management", Proc. of Intl. Conf. Disaster Management III, 9-11 July 2013, A Coruna, Spain.

Participation to other COST Actions
No.

Role in COST Action TU1208
Leader of Project 4.2. WG Member (WG3: Projects 3.2; WG4: Projects 4.1, 4.2, 4.5).

Italy

FABRIZIO FREZZA
Full Professor of Electromagnetic Fields
"La Sapienza" University of Rome, Dept. of Information Eng., Electr. and Telecommunications
Via Eudossiana 18, 00184 Roma, Italy
Phone: +39 06 4458 5841 - Fax: +39 06 4458 5918
e-mail: fabrizio.frezza@uniroma1.it

Biographical sketch

In 1986, Fabrizio Frezza joined the Department of Electronics of La Sapienza University, where he was Researcher from 1990 to 1998, temporary Professor of Electromagnetic Fields from 1994 to 1998, Associate Professor from 1998 to 2004, and he has been Full Professor of Electromagnetic Fields since 2005. Fabrizio Frezza has been Member of the Board of the EU School of Antennas (ESoA) since 2005: he is in charge of the Course "Leaky Waves and Periodic Structures for Antenna Applications". He is author of two on-line textbooks on basic and advanced electromagnetics. He is author of about 400 papers and author or editor of four books. He belongs to the Editorial Board of IEEE Transactions on Microwave Theory and Techniques. He also serves as a reviewer for international journals. He is a Senior Member of IEEE (Institute of Electrical and Electronics Engineers), a Member of OSA (Optical Society of America), of Sigma Xi, and of Metamorphose Virtual Institute.

Main experience in the Action's topics

- Development of full-wave methods for the solution of electromagnetic forward-scattering problems by buried two-dimensional and three-dimensional structures.
- Numerical techniques for the localization of buried cylindrical structures from GPR data.
- Synthesis, analysis and experimental characterization of antennas.

Recent publications on the Action's topics

- F. Frezza, L. Pajewski, C. Ponti, G. Schettini, and N. Tedeschi, "Electromagnetic Scattering by a Metallic Cylinder Buried in a Lossy Medium with the Cylindrical Wave Approach", Geoscience and Remote Sensing Letters, January 2013, pp. 179-183, vol. 10, no. 1.
- F. Frezza, F. Mangini, L. Pajewski, G. Schettini, N. Tedeschi, "Spectral domain method for the electrom. scattering by a buried sphere", J. Opt. Soc. Am. A, 30(4), 783-790, 2013.
- F. Frezza, L. Pajewski, C. Ponti, G. Schettini, and N. Tedeschi, "Cylindrical-Wave Approach for electromagnetic scattering by subsurface metallic targets in a lossy medium," J. Applied Geophysics, 2013, in press, doi:10.1016/j.jappgeo.2013.01.004.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Substitute Member. WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1, 4.2, 4.5).

Italy

GUIDO MANACORDA
Engineering Manager
IDS Ingegneria dei Sistemi SpA – Georadar Division
via E. Calabresi 24, 56121 Pisa, Italy
Phone: +39 050 3124363 - Fax: +39 050 3124205
e-mail: g.manacorda@idscorporation.com

Biographical sketch

Guido Manacorda graduated in Electronics Engineering in 1992 from Pisa University. After a few months spent at the Engineering Faculty studying a spectral evaluation method for ultrasound biomedical systems, he joined IDS in January 1993. He contributed to the development of the first innovative array-based GPR's as part of a project joint project between IDS and Telecom Italia: these prototypes were the basis for the growth of the IDS GPR product line which now features multi-channel and multi-frequency arrays. He has a very wide experience in GPR use for detection of subsoil utilities, surveying of buildings, archaeology. He is author of many papers in scientific journals and conference publications on GPR design and applications and has been the Chief Engineer of the IDS Georadar division since 1999. He played a key role as IDS project leader in the GIGA EU project (FP5), IDS Project Manager in the Orfeus (FP6 and FP7) and Nettun projects (FP7).

Main experience in the Action's topics

- Development of Ground Penetrating Radar equipment (controller, antenna, software).
- Manufacturing and Product Engineering.
- Applications of Ground Penetrating Radar in civil engineering.

Recent publications on the Action's topics

- G. Manacorda, A. Simi, A. Benedetto, "Bridge deck survey with high resolution Ground Penetrating Radar", GPR2012 International Conference, Shanghai, China.
- A. Benedetto, G. Manacorda, A. Simi, F. Tosti, "Novel perspectives in bridges inspection using GPR", Nondestructive Testing and Evaluation, Vol. 27, No. 3, 2012, 239–251, T&F.
- F. A. Romero, G. Manacorda, A. Simi, N. Gucunski, H. Parvardeh, "Examination of Single- and Multi-Channel GPR Bridge Deck Condition Assessment Methods with Comparison to Complementary NDE Results, EGU International Conference 2013, Wien, Austria.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG1 Chair. WG Member (WG1: Projects 1.1, 1.2).

Italy

FABIO MANGINI
Researcher in Electromagnetics
Dept. of Dept. of Information Engineering, Electronics and Telecommunications, "La Sapienza" University of Rome. Via Eudossiana 18, 00184 Roma, Italy.
Phone: +39 0644585379
e-mail: fabio.mangini@diet.uniroma1.it

Biographical sketch
Dr Fabio Mangini received Bachelor's degree in Clinical Engineering in 2005 and the Master degree in Biomedical Engineer from "La Sapienza" University of Rome, Italy in 2008. He received the Ph.D. in Electromagnetism Applied from the Department of Information Engineering, Electronics and Telecommunications, in the same University in 2014. Since 2009 he works with the Laboratory of Electromagnetic Fields II of "La Sapienza University of Rome".

Main experience in the Action's topics
- Development a spectral-domain method to study the electromagnetic scattering by a buried sphere in a lossy or lossless medium.
- Development of some numerical model to study the electromagnetic response from buried object.
- Development of model in quasi-static approximation to study the study the electromagnetic response by spherical objects.

Recent publications on the Action's topics
- F. Mangini, N. Tedeschi, F. Frezza, and A. Sihvola, "Analysis of the polarizability of an array of spherical metallic inclusions in a dielectric host sphere," J. Opt. Soc. Am. A., vol. 31, no. 11, pp. 2409-2414, 2014.
- F. Mangini, N. Tedeschi, F. Frezza, and A. Sihvola, "Electromagnetic interaction with two eccentric spheres," J. Opt. Soc. Am. A., vol. 31, no. 4, pp. 783-789, 2014.
- F. Frezza, F. Mangini, E. Stoja, and N. Tedeschi, "Fouling detection in buried water pipelines by observation of the scattered electromagnetic field," European Geosciences Union General Assembly 2014, Vienna, Austria, 2014.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG4: Project 4.2).

Italy

LUCA MANICA
Post Doc in Electromagnetics
ELEDIA Research Center @ DISI, University of Trento
via Sommarive 5, I-38123 Trento, Italy
Phone.: +39 0461 28 1502 - Fax: +39 0461 28 3166
e-mail: luca.manica@disi.unitn.it

Biographical sketch
Luca Manica received the B.S. degree and M.S. degree in Telecommunication Engineering from University of Trento in 2004 and 2006 respectively, and the Ph.D. degree in Information and Communication Technologies from the ICT Doctoral School of the University of Trento, Italy, in 2010. He is currently a postdoctoral researcher at the Department of Information Engineering and Computer Science (University of Trento) and a member of the ELEDIA Research Center. His main interests are the analysis and synthesis of antenna array, optimization techniques and electromagnetic inverse scattering. Dr. Manica is a member of the IEEE Antennas and Propagation Society. He serves as a reviewer for IEEE Transactions on Antennas and Propagation and IEEE Antennas and Propagation Letters.

Main experience in the Action's topics
- Solution of inverse scattering problems for non destructive evaluation and testing
- Applications of Ground Penetrating Radar for subsurface sensing.
- Automatic detection of relevant features from backscattered data in subsurface imaging.
- Study, development, design, analysis and testing of antenna arrays.
- Reduction of the complexity of RADAR antenna arrays.

Recent publications on the Action's topics
- L. Manica, P. Rocca, M. Salucci, M. Carlin, and A. Massa, "Scattering data inversion through interval analysis under Rytov approximation," in Proc. 2013 IEEE EuCAP, 7th European Conference on Antennas and Propagation, pp. 82 – 85, Gothenburg, Sweden, 8th – 12th April 2013.
- N. Anselmi, L. Manica, P. Rocca, and A. Massa, " Tolerance analysis of antenna arrays through interval arithmetic," IEEE Trans. Antennas Propag. 2013, in press.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.4; WG4: Projects 4.1, 4.4, 4.6).

Italy

ANDREA MASSA
Full Professor in Electromagnetic Fields
ELEDIA Research Center, Univ. of Trento
Dept. of Information Eng. & Comp. Science
via Sommarive 5, I-38123 Trento, Italy
Phone: +39 0461 282057 - Fax: +39 0461 283166
e-mail: andrea.massa@unitn.it

Biographical sketch
Andrea Massa from 1997 to 1999 was an Assistant Professor of EM fields at the Department of Biophysical and Electronic Eng. (University of Genoa). From 2001 to 2004, he was Associate Professor at the Univ. of Trento. Since 2005, he has been a Full Professor at the University of Trento. He is the director of the ELEDIA Research Center at the Univ. of Trento and Deputy Dean of the Faculty of Eng. Moreover, he is Adjunct Professor at Penn State Univ., Visiting Professor at the Missouri Univ. of Science and Technology, Nagasaki Univ., Univ. of Paris Sud, and Kumamoto Univ. He is a member of the IEEE, of the PIERS Tech. Committee, of the Inter-Univ. Research Center for Interactions Between EM Fields and Biological Systems. He serves as Associate Editor of the IEEE Trans. on Antennas and Prop.

Main experience in the Action's topics
- Development of real-time techniques for GPR data processing. Application of 2D and 3D inversion algorithms to GPR scenarios. Research activities in the framework of electromagnetic direct and inverse problems, microwave imaging, optimization techniques, wave propagation in nonlinear media, antenna and array synthesis.

Recent publications on the Action's topics
- M. Salucci, D. Sartori, N. Anselmi, A. Randazzo, G. Oliveri, and A. Massa, "Imaging Buried Objects within the Second-Order Born Approximation through a Multiresolution Regularized Inexact-Newton Method", 2013 International Symposium on Electromagnetic Theory (EMTS), (Hiroshima, Japan), May 20-24 2013.
- L. Manica, P. Rocca, M. Salucci, M. Carlin, and A. Massa, "Scattering data inversion through interval analysis under Rytov approximation," 7th European Conference on Antennas Propag. (EuCAP 2013), Gothenburg, Sweden, Apr. 8-12, 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (WG2: Projects 2.2, 2.3; WG3: Projects 3.2). Local Organiser COST-ESoA Training School on Microwave Imaging.

Italy

LOREDANA MATERA
PhD Student in Geophysics
Bari "A.Moro" University - Department of in Earth Science, Via Orabona, 4 - 70125 Bari, Italy
Phone: +39 0805442625
e-mail: loredana.matera@uniba.it

Biographical sketch

Loredana Matera received the Laurea degree in Geology with full marks (evaluation 110/110) since 2004 from "A. Moro" University of Bari, Italy, and she qualified as a geologist in 2005. In 2007 she started to work as a researcher for the Institute for Archaeological and Monumental Heritage (CNR-IBAM) of Lecce. Since 2009 she has been leading classes for the courses "Restoration technologies and materials" and "Science, technologies and transport phenomena in the materials" held in the University of Salento for the degree in "Technologies of Conservation and Restoration". Currently, she is a PhD student in Geomorphology and Environmental Dynamics at the University of Bari. Her main research interests are geophysical methods, especially the GPR and its applications in Cultural Heritage, characterization of natural and artificial materials, conservation treatments on natural stone materials in Cultural Heritage, diagnostic techniques for the evaluation of stone decay in buildings, historic places and monuments.

Main experience in the Action's topics

- Applications of Ground Penetrating Radar in Cultural Heritage.
- Characterization and laboratory diagnostic study of natural and artificial stone materials.

Recent publications on the Action's topics

- A. Cataldo, R. Persico, G. Leucci, E. De Benedetto, G. Cannazza, L. Matera, L. De Giorgi: "Time domain reflectometry, ground penetrating radar and electrical resistivity tomography: a comparative analysis of alternative approaches for leak detection in underground pipes", NDT&E, 2014.
- A. Calia, M. Lettieri, G. Leucci, L. Matera, R. Persico, M. Sileo (2013): " The mosaic of the crypt of St. Nicholas in Bari (Italy): Integrated GPR and laboratory diagnostic study", Journal of Archaeological Science, 40 (2013) 4162-4169.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG1: Project 1.1).

Italy

GIANFRANCO MATUOZZO
Ph.D. Student in Signal & Image Processing University of Napoli "Parthenope" Department of Engineering
Centro direzionale di Napoli, Isola C4, 80143
Napoli, Italy Tel. : +39 081 547
E-mail: gianfranco.matuozzo@uniparthenope.it

Biographical sketch
Gianfranco Matuozzo received both BS and MS degrees in Management Engineering (summa cum laude) from University of Napoli "Parthenope", Italy, and he is now attending the second year of Ph.D. in Information Engineering at University of Napoli "Parthenope". His main research interests are in the field of automotive radar and its applications, Synthetic Aperture Radar signal processing and Magnetic Resonance Imaging.

Main experience in the Action's topics
- Development of 3D focusing algorithms for radar applications.
- Development of methods for the statistical image processing of Magnetic Resonance Imaging signal.

Recent publications on the Action's topics
- Baselice F., Ferraioli G., Matuozzo G. Pascazio V., Schirinzi G. "Automotive Imaging Radar 3D focusing", EuRAD 2014, Rome, Italy, submitted

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Projects 3.1-3.6; WG4: Projects 4.1-4.6).

Italy

FERDINANDO NUNZIATA
Assistant Professor in Electromagnetics
"Parthenope" University of Naples
Department of Engineering
Centro Direzionale, isola C4
80143 Napoli, Italy, Phone:+390815476779
e-mail: ferdinando.nunziata@uniparthenope.it

Biographical sketch
Ferdinando Nunziata was born in Italy in 1982. Since 2010, he has been Assistant Professor in electromagnetic fields with the Università degli Studi di Napoli "Parthenope". Since 2013, he has been guest professor with the Shanghai Ocean University, College of Marine Science, Shanghai, China. His main research interests include electromagnetic modeling, single- and multi-polarization sea surface scattering, radar polarimetry, synthetic aperture radar (SAR) sea oil slick and metallic target monitoring, spatial resolution enhancement techniques, Global navigation satellite system reflectometry (GNSS- R), reconstruction of aperture-filtered samples in Hilbert and Banach spaces. Dr. Nunziata has been IEEE Senior member since 2014 and he has been in the organizing committee of the IEEE Graduate of Last Decade (GOLD) Remote Sensing Conference since 2008. He is the Chairman of the Università degli Studi di Napoli "Parthenope" IEEE Student Branch and he has been GOLD representative to the GRSS (Geoscience and Remote Sensing Society) AdCom since 2010. In 2012, he received the Latmiral Prize by Italian Society of Electromagnetics (SIEm). In 2009, he received the Sebetia-Ter 2009 award. In 2004, he received the Best Remote Sensing Thesis Award Provided by the IEEE GRS South Italy Chapter.

Main experience in the Action's topics
- Reconstruction of aperture-filtered samples in Hilbert and Banach spaces.
- Spatial resolution enhancement techniques.

Recent publications on the Action's
- D. Schiavulli, F. Nunziata, G. Pugliano and M. Migliaccio, "Reconstruction of the Normalized Radar Cross Section field from GNSS-R Delay-Doppler Map," IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing (JSTARS). In print
- F. Lenti, F. Nunziata, M. Migliaccio, and G. Rodriguez, "Two-dimensional TSVD to enhance the spatial resolution of radiometer data," IEEE Trans. on Geoscience and Remote Sensing.

Participation to other COST Actions
No.

Role in COST Action TU1208
Participant of WG3 (Projects 3.1-3.6) and WG4 (Projects 4.1-4.6).

Italy

GIACOMO OLIVERI
Researcher in Electromagnetic Fields
ELEDIA Research Center @ DISI, University of Trento
via Sommarive 5, I-38123 Trento, Italy
Phone.: +39 0461 28 5227
Fax: +39 0461 28 3166
e-mail: giacomo.oliveri@unitn.it

Biographical sketch
Giacomo Oliveri received the B.S. (summa cum laude) and M.S. (summa cum laude) degrees in Telecommunications Engineering and the PhD degree in Space Sciences and Engineering from the University of Genoa, Italy, in 2003, 2005, and 2009 respectively. He is currently an Assistant Professor at the Department of Information Engineering and Computer Science (University of Trento) and a member of the ELEDIA Research Center. He is author/co-author of over 150 peer reviewed papers on international journals and conferences. He has been a visiting researcher at the University of Paris Sud, France, in 2012 and 2013. His research work is mainly focused on electromagnetic direct and inverse problems, material-by-design and metamaterials, and antenna array design and synthesis. Dr. Oliveri is a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), and a member of the IEEE Antennas and Propagation Society, of the National Interuniversity Consortium for Telecommunications (CNIT), and of the Italian Society of Electromagnetics (SIEM).

Main experience in the Action's topics
- Methodologies for the solution of direct and inverse-scattering problems in GPR scenarios.
- Applications of Ground Penetrating Radar in security applications.
- Study, development, design, analysis and testing of antenna arrays.
- Design and fabrication of wideband and multiband antennas.

Recent publications on the Action's topics
- L. Poli, G. Oliveri, and A. Massa, "Imaging sparse metallic cylinders through a local shape function Bayesian Compressive Sensing approach," Journal of Optical Society of America A, vol. 30, no. 6, pp. 1261-1272, 2013.
- L. Poli, G. Oliveri, P. Rocca, and A. Massa, "Bayesian Compressive Sensing approaches for the reconstruction of two-dimensional sparse scatterers under TE illuminations", IEEE Trans. Geosci. Remote Sens., vol. 51, no. 5, pp. 2920-2936, May 2013. 3

Participation to other COST Actions
No.

Role in COST Action TU1208
Participant of WG2 (Projects 2.1), WG3 (Projects 3.2).

Italy & Poland

LARA PAJEWSKI
Researcher in Electromagnetic Fields
"Roma Tre" University - Department of Engineering
Via Vito Volterra 62, 00146 Rome, Italy
Phone: +39 06 57337095 Fax: +39 06 57337026
e-mail: lara.pajewski@uniroma3.it

Biographical sketch
Lara Pajewski received the *Laurea* degree in Electronic Engineering cum laude from "Roma Tre" University of Rome, Italy, and the Doctorate in Applied Electromagnetics and Electrophysics Sciences from "La Sapienza" University of Rome. She currently is a Researcher in "Roma Tre" University. She is the Western-Europe Regional Editor for the Taylor&Francis Journal "Nondestructive Testing And Evaluation" and since 2011 convenes the Session "Civil Engineering Applications of GPR" at the EGU General Assembly. She was a member of the Scientific Committee of the 2013 Intl. Workshop on Advanced GPR and co-Chair of the 15th Intl. Conference on Ground Penetrating Radar. She is the (co-)author of more than 200 scientific works on books, journals, and conference proceedings and the editor of 15 books and journal special issues; her main research interests are in GPR and its applications, NDT methods, electromagnetic modelling of complex scenarios, antennas design and characterisation. For more info, please visit gpradar.eu/people/chair-of-the-action.html

Main experience in the Action's topics
Applications of GPR in civil engineering. Development of full-wave methods for the solution of EM scattering problems. Design and experimental characterisation of antennas.

Recent publications on the Action's topics
- Nondestructive Test. and Evaluation, Special Issue (SI) on "Civil Engineering Applications of Ground Penetrating Radar", A. Benedetto & L. Pajewski, Eds., Vol. 27(3), Sept. 2012.
- J. Appl. Geoph., SI on "GPR for nondestructive evaluation of pavements, bridges and subsurface infrastructures", A. Benedetto, A. Loizos, L. Pajewski & E. Slob, Eds., 2013.
- Proc. 15th Intl. Conference on Ground Penetrating Radar (GPR2014), S. Lambot, A. Giannopoulos, L. Pajewski, F. De André, E. Slob & C. Craeye, Eds., ISBN 978-1-4799-6789-6.
- A. Benedetto, L. Pajewski, Eds., "Civil Engineering Applications of Ground Penetrating Radar," Springer, April 2015, ISBN 978-3- 319-04812-3.

Participation to other COST Actions
MP0702 "Towards Functional Sub-Wavelength Photonic Structures". TU1206 "SUB-URBAN: A European network to improve understanding and use of the ground beneath our cities".

Role in COST Action TU1208
Chair of the Action. Grant Holder Manager and Scientific Representative.

Italy

VITO PASCAZIO

Full Professor of Telecommunications and Chair of
Department of Engineering
University of Napoli "Parthenope"
Department of Engineering
Centro Direzionale Isola C4, 80143, Napoli, Italy
Phone: +39 081 5476712
Fax: +39 081 5476714
e-mail: vito.pascazio@uniparthenope.it

Biographical sketch

Vito Pascazio received the Laurea degree (summa cum laude) in Electronic Engineering from the University of Bari, Italy, in 1986 and the Ph.D. degree in Electronic Engineering and Computer Science from the University of Napoli "Federico II," Napoli, Italy, in 1990. In 1990, first, he was with IRECE – Consiglio Nazionale delle Ricerche, Napoli, and then, he joined the University of Napoli "Parthenope", where he is now a Full Professor of telecommunications. In the same year he won the Philip Morris prize for scientific and technological research. From 1994 to 1995, he was a Visiting Scientist with the Laboratoire des Signaux et Systemes, Ecole Superieure d'Electricite (Supelec), Gif sur Yvette, France, and from 1998 to 1999, he was briefly with the Universite de Nice, Sophia–Antipolis, France. From 2011 he is Director of Laboratorio Nazionale di Comunicazioni Multimediali of CNIT and from 2013 Director of Department of Engineering at University of Napoli "Parthenope".

Main experience in the Action's topics

- Forward-scattering problems by buried 2-D and 3-D structures.
- Compressive Sensing for the solution of electromagnetic inverse scattering problems.
- Inverse scattering problems by 2-D and 3-D structures based on MAP estimation

Recent publications on the Action's topics

- R. Autieri, M. D'Urso, S. Malanga, V. Pascazio, "Compressive Sampling for Microwave Tomography", IEEE International Geoscience and Remote Sensing Symposium, IGARSS 2011, July 24-29, Vancouver, Canada.
- R. Autieri, M. D'Urso, T. Isernia and V. Pascazio, "Inverse Profling via an Effective Linearized Scattering Model and MRF Regularization", IEEE Geoscience and Remote Sensing Letters, vol. 8, no. 6, pp. 1021-1025, November 2011.

Participation to other COST Actions

No.

Role in COST Action TU1208

- Participant of WG3 (Projects 3.1-3.6) and WG4 (Projects 4.1-4.6)

Italy

MATTEO PASTORINO
Full Professor of Electromagnetic Fields
University of Genoa – Dpt. of Electrical, Electronic,
Telecomm. Engineering and Naval Architecture (DITEN)
Via Opera Pia 11A, I-16145 Genova, Italy.
Phone: +39 0103536588, Fax: +39 0103532777
e-mail: matteo.pastorino@unige.it

Biographical sketch

Matteo Pastorino, since 2008, has been a Full Professor of Electromagnetic Fields at the University of Genoa. He has been the past Director of the Department of Biophysical and Electronic Engineering. Currently, he is the Director of the Department of Telecomm., Electronic, Electrical Eng. and Naval Arch. He is also the responsible of the local section of the National Soc. of Electromagnetics and the Vice-chair of the URSI Italian Comm. B. His main research interests are in the field of imaging and diagnostic systems, antennas and propagation, direct and inverse electromagnetic scattering and radar modeling. He is the author of the book *Microwave Imaging* (Wiley, 2010) and the coauthor of about 400 papers in journals and proceedings. He has been an Ass. Editor of the IEEE Trans. on Antennas and Prop. (2004-2010). At present, he is an Associate Editor of the IEEE Trans. on Instrum. and Meas. and of the Intl. J. of Antennas and Prop. He is also a member of the editorial boards and technical program committees of several other international journals and conferences.

Main experience in the Action's topics

- Numerical methods for the solution of EM inverse-scattering problems by buried structures and localization approaches based on Support Vector Machines
- Development of optimization techniques based on stochastic methods.
- Synthesis and analysis of smart antennas.

Recent publications on the Action's topics

- S. Meschino, L. Pajewski, M. Pastorino, A. Randazzo, G. Schettini, "Detection of subsurface metallic utilities by means of a SAP technique: Comparing MUSIC- and SVM-based approaches", J. Applied Geophysics, 2013, in press, doi:10.1016/j.jappgeo.2013.01.011.
- M. Maffongelli, R. Monleone, M. Pastorino, S. Poretti, A.Randazzo, A. Salvadè, "Reconstruction of metallic inclusions inside dielectric targets by means of a microwave tomographic system," IEEE Microw. Wireless Comp. Lett., 22(7), 378-380, July 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG3 Vice-Chair. WG Member (WG3: Projects 3.1-3.4).

Italy

CRISTINA PAUSELLI
Geophysics Researcher
"Università di Perugia"- Dipartimento di Fisica e Geologia
Via Alessandro Pascoli, s.n.c. 06123 Perugia (PG), Italy.
Phone.: +39 075 5867177
Fax: +39 075 5867167
e-mail: cristina.pauselli@unipg.it

Biographical sketch

Cristina Pauselli is a researcher in Geophysics of the Solid Earth at the Department of Earth Sciences, University of Perugi. She graduated in Geology at 'University of Perugia in 1996, with honors and in January 2001 acquired the title of Ph.D. In 1998 spent six months at the Research School of Earth Science (Australian National University - Canberra) as Visiting Researcher and in 2000 she won a research fund for young researchers from the University of Perugia bandit. From January 2001 to 2004 she held a fellowship at the Department of Earth Sciences, University of Perugia in November 2001, he obtained a Master in General and Applied Geophysics with a score of Excellent at the University Consortium of La Spezia. Since 1996, conducts research and teaching in the Department of Earth Sciences, University of Perugia on 2D simulations to derive the temperature distribution in compressive and extensional tectonic regimes; kinematics and geodynamic evolution of compression and extensional systems; GPR: acquisition and interpretation of data in areas seismically active..

Main experience in the Action's topics

- Common offset, multi-fold data processing and velocity analysis.
- Applications of Ground Penetrating Radar in civil engineering.

Recent publications on the Action's topics

- Pauselli Cristina, Federico Costanzo, Frigeri Alessandro, Orosei Roberto, Barchi Massimiliano Rinaldo, Basile Gabriele, (2010) Ground Penetrating Radar investigations to study active faults in the Norcia Basin (Central Italy) . Journal of Applied Geophysics, 72, Iussue 1, 39-45.
- M. Ercoli, C. Pauselli, A. Frigeri, E. Forte, C. Federico, (2014) "3-D GPR data analysis for high resolution imaging of shallow subsurface faults: the Mt. Vettore case study (Central Apennines, Italy)". In: Geophysical Journal International - (GJI), 198:1(609-621)

Participation to other COST Actions

No

Role in COST Action TU1208

WG Member (WG2: Projects 2.2-2.4;WG4: Projects 4.1, 4.4, 4.5).

Italy

MASSIMILIANO PIERACCINI
Associate Professor
Department of Information Engineering via Santa Marta, 3 50139 Firenze, Italy Phone: +39 055 4796273
e-mail: massimiliano.pieraccini@unifi.it

Biographical sketch

Massimiliano Pieraccini graduated in physics in 1994 ("Nello Carrara" degree prize) at the University of Florence, Italy, and received the Ph.D. degree in non-destructive testing in 1998. In 1995, he joined the Department of Electronics and Telecommunications of the University of Florence, where in 1997 he gained the permanent position of Assistant Professor. Since 2005, he has been an Associate Professor. He teach "Basic Electronics" and "Technologies for Cultural Heritage". He is general co-chair of the 8th International Workshop on Advanced Ground Penetrating Radar (IWAGPR). He is a member of the Institute of Electrical and Electronics Engineers (IEEE).

Main experience in the Action's topics

- Electronic design of CW-SF GPR
- Prototyping of GPR systems
- Field test of Ground Penetrating Radar
- Design and applications of Very Large Frequency GPRs
- GPR Masonry investigation

Recent publications on the Action's topics

- R. Persico, G. Leucci, L. Matera, M. Ciminale, D. Dei, F. Parrini, M. Pieraccini, Applications of a reconfigurable stepped frequency GPR in the Chapel of the Holy Spirit, Lecce (Italy), 2013 7th International Workshop on Advanced Ground Penetrating Radar (IWAGPR), 2013
- F. Parrini, M. Pieraccini, D. Mecatti, D.Dei, G. Macaluso, A. Spinetti, R. Persico, G. Leucci, G. Manacorda, A reconfigurable stepped frequency GPR (GPR-R): The antenna subsystem, 2013 7th International Workshop on Advanced Ground Penetrating Radar (IWAGPR), 2013

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Associate Member (WG1).

Italy

LORENZO POLI
Post Doc in Electromagnetics
ELEDIA Research Center @ DISI, University of Trento
via Sommarive 5, I-38123 Trento, Italy
Phone: +39 0461 28 5245
Fax: +39 0461 28 3166
e-mail: lorenzo.poli@disi.unitn.it

Biographical sketch
Lorenzo Poli received the and M.S. degrees in Telecommunications Engineering and the Ph.D. degree in Information and Communication Technologies from the University of Trento, Italy, in 2008 and 2012, respectively. He is currently a postdoctoral researcher at the Department of Information Engineering and Computer Science (University of Trento) and a member of the ELEDIA Research Center. His main interests are the synthesis of the antenna array and electromagnetic inverse scattering. Dr. Poli is a member of the IEEE Antennas and Propagation Society and in 2010 he was a recipient of the IEEE AP-S Doctoral Research Award. He serves as a reviewer for IEEE Transactions on Antennas and Propagation and IEEE Antennas and Propagation Letters.

Main experience in the Action's topics
- Development of efficient strategies for the solution of inverse scattering problems for nondestructive evaluation and testing (NDE/NDT).
- Applications of Ground Penetrating Radar for subsurface sensing.
- Development of real-time processing techniques for the automatic detection of relevant features from backscattered data in subsurface imaging.
- Study, development, design, analysis and testing of antenna arrays.
- Development of adaptive strategies for automatic systems reconfiguration in time-varying scenarios.

Recent publications on the Action's topics
- L. Poli, G. Oliveri, F. Viani, and A. Massa, "MT-BCS-based microwave imaging approach through minimum-norm current expansion," IEEE Trans. Antennas Propag., vol. 61, no. 9, pp. 4722-4732, Sep. 2013.
- L. Poli, G. Oliveri, and A. Massa, "Imaging sparse metallic cylinders through a local shape function Bayesian Compressive Sensing approach," Journal of Optical Society of America A, vol. 30, no. 6, pp. 1261-1272, 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Project 2.4; WG4: Projects 4.3, 4.4).

Italy

SANTO PRONTERA
Ph.D. Student in Electromagnetics
"La Sapienza" University of Rome – Dept. of Information Engineering, Electronics and Telecommunications
via Eudossiana 18, 00184 Rome, Italy
Phone: +39 064458 5379
e-mail: santo.prontera@uniroma1.it

Biographical sketch
Santo Prontera received the *Laurea* (Master) degree in Electronic Engineering from "La Sapienza" University of Rome, Italy, where he is currently a Ph.D. student in Electromagnetics. His main research interests are in electromagnetic scattering problems, Ground Penetrating Radar (GPR) and its applications, antenna analysis, design and experimental characterization, and material evaluation tools.

Main experience in the Action's topics
Measurements of GPR Signals with superimposed noise.

Recent publications on the Action's topics
- S. Chicarella, V. Ferrara, F. Frezza, L. Pajewski, S. Pavoncello, S. Prontera, and N. Tedeschi, "Analyses and Measures of GPR Signal with Superimposed Noise", EGU General Assembly 2014, Vienna, 27 April - 2 May 2014.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.1) and WG4 (Project 4.2).

Italy

ANDREA RANDAZZO
Assistant Professor
University of Genoa – Dept. of Electrical, Electronic, Telecommunications Eng. and Naval Architecture
Via Opera Pia 11A, I-16145 Genova, Italy.
Phone: +39 0103532242 Fax: +39 0103532777
e-mail: andrea.randazzo@unige.it

Biographical sketch

Andrea Randazzo from 2001 to 2008 worked with the Applied Electromagnetics Group of the Dpt. of Biophysical and Electronics Eng. of the Univ. of Genoa. In 2006 he was Visiting Research Scholar at the Applied Microwave Nondestructive Testing Lab. of the Missouri Univ. of Sc. & Tech. From 2009 to 2010 he was with Ansaldo Energia as a Team Leader. Since 2010 he is an assistant professor at the Dpt. of Electrical, Electronic, Telecomm. Eng., and Naval Architecture of the University of Genoa. Its main research activities are related to the development of innovative numerical methods for electromagnetic imaging, smart algorithms applied to antennas, and radar modeling. He is co-author of more than 120 papers. He serves regularly as reviewer for several international journals and conferences and he is member of the Tech. Program Comm. of IEEE conferences.

Main experience in the Action's topics

- Numerical methods for solving EM inverse-scattering problems by buried structures.
- Optimization techniques based on stochastic methods.
- Localization approaches for buried structures based on Support Vector Machines.
- Synthesis and analysis of smart antennas and arrays.
- Experimental studies using prototypes of imaging systems.

Recent publications on the Action's topics

- C. Estatico, M. Pastorino, A. Randazzo, "A novel microwave imaging approach based on regularization in Banach spaces," IEEE Trans. Antennas Prop., 60(7), 3373-3381, 2012
- A. Randazzo and C. Estatico, "A regularisation scheme for electromagnetic inverse problems: Application to crack detection in civil structures," Nondestructive Testing and Evaluation, vol. 27, no. 3, pp. 189-197, 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

Leader of Project 3.2. WG Member (WG3: Project 3.2).

Italy

PAOLO ROCCA
Researcher in Electromagnetics
ELEDIA Research Center @ DISI, University of Trento
via Sommarive 5, I-38123 Trento, Italy
Phone.: +39 0461 28 3998
Fax: +39 0461 28 3166
e-mail: paolo.rocca@disi.unitn.it

Biographical sketch
Paolo Rocca received the MS degree in Telecommunications Engineering from the University of Trento in 2005 (with Honors) and the PhD Degree in Information and Communication Technologies from the same University in 2008. He is currently an Assistant Professor at the Department of Information Engineering and Computer Science (University of Trento) and a member of the ELEDIA Research Center. He has been a visiting student at the Pennsylvania State University and at the University Mediterranea of Reggio Calabria. Dr. Rocca has been awarded from the IEEE Geoscience and Remote Sensing Society and the Italy Section with the best PhD thesis award IEEE-GRS Central Italy ChapterHe serves as an Associate Editor of the IEEE Antennas and Wireless Propagation Letters. Dr. Rocca is a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE), and a member of the IEEE Antennas and Propagation Society, of the National Interuniversity Consortium for Telecommunications, and of the Italian Society of Electromagnetics.

Main experience in the Action's topics
- Optimization strategies for the solution of inverse-scattering problems in GPR scenarios.
- Study, development, design, analysis and testing of antenna arrays.
- Design and fabrication of wideband and multiband antennas.

Recent publications on the Action's topics
- L. Poli, G. Oliveri, P. Rocca, and A. Massa, "Bayesian Compressive Sensing approaches for the reconstruction of two-dimensional sparse scatterers under TE illuminations", IEEE Trans. Geosci. Remote Sens., vol. 51, no. 5, pp. 2920-2936, May 2013.
- G. Oliveri, L. Poli, P. Rocca, and A. Massa, "Bayesian compressive optical imaging within the Rytov approximation", Opt. Lett., vol. 37, no. 10, pp. 1760-1762, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Project 2.4; WG3: Projects 3.3, 3.4).

MARCO SALUCCI
Ph.D Student
ELEDIA Research Center @ DISI, University of Trento
Via Sommarive 5, I-38123 Trento, Italy
Phone.: +39 0461 28 1502
Fax: +39 0461 28 3166
e-mail: marco.salucci@disi.unitn.it

Biographical sketch
Marco Salucci received the B.S. (summa cum laude) and M.S. (summa cum laude) degrees in Telecommunication Engineering from the University of Trento, Italy, in 2009 and 2011, respectively. From March 2011, he is a member of the ELEDIA Research Center, and from November 2011 a Ph.D. student of the ICT International Doctoral School of Trento. His research work in mainly focused on wireless communications, wireless/wired network planning, wireless sensor networks (WSN), computational electromagnetics and modeling, antenna design and inverse problems.

Main experience in the Action's topics
- Methodologies for the solution of direct and inverse-scattering problems in GPR scenarios
- Applications of Ground Penetrating Radar for subsurface sensing
- Real-time processing techniques for detection of features in subsurface imaging
- Design and fabrication of wideband and multiband antennas

Recent publications on the Action's topics
- M. Salucci, P. Rocca, G. Oliveri, and A. Massa, "An innovative frequency hopping multi-zoom inversion strategy for GPR subsurface imaging," 15th International Conference on Ground Penetrating Radar (GPR2014), Brussels, Belgium, June 30 - July 04, 2014.
- M. Salucci, G. Oliveri, A. Randazzo, M. Pastorino, and A. Massa, "Multi-Focusing Procedure based on the Inexact-Newton Method for Electromagnetic Subsurface Prospecting," European Geosciences Union General Assembly (EGU2014), Vienna, Austria, 2014 .
- M. Salucci, L. Tenuti, C. Nardin, G. Oliveri, F. Viani, P. Rocca, and A. Massa , "Civil engineering applications of ground penetrating radar recent advances @ the ELEDIA Research Center," *European Geosciences Union General Assembly*, Vienna, Austria,2014.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.2).

Italy

GILDA SCHIRINZI
Full Professor in Telecommunications
University of Napoli "Parthenope"
Department of Engineering Centro Direzionale Isola C4,
80143, Napoli, Italy
Phone: +39 081 5476749
e-mail: gilda.schirinzi@uniparthenope.it

Biographical sketch

Gilda Schirinzi graduated summa cum laude in Electronic Engineering in 1983 at University of Naples "Federico II". In the same year she joined the Electronic Engineering Department as research fellow. From 1985 to 1986 she was at European Space Agency, ESTEC, The Netherlands. In 1988 she joined the Istituto di Ricerca per l'Elettromagnetismo e i Componenti Elettronici (IRECE), of the Italian National Council of Research (CNR), in Naples. In 1992 she was appointed Head of Electromagnetics Division of IRECE, and in 1997 she became Senior Researcher. In November 1998, she joined the University of Cassino as Associate Professor of Telecommunications. Since November 2008 she is at University of Naples "Parthenope", in the Telecommunication group. Her main scientific interests are in the field of Synthetic Aperture Radar (SAR) signal processing and coding, SAR interferometry, microwave imaging techniques and image and signal processing for remote sensing applications. Recently, she was involved in the application of Compressive Sampling to SAR imaging.

Main experience in the Action's topics

- Development of 3D focusing algorithms for radar applications
- Applications of Compressive Sampling to SAR tomography
- Development of advanced SAR and InSAR data processing techniques

Recent publications on the Action's topics

- A. Budillon, A. Evangelista and G. Schirinzi, "GLRT Detection of Moving Targets via Multibaseline Along-Track Interferometric SAR Systems" IEEE Geoscience and Remote Sensing Letters, vol. 9, no. 3, May 2012.
- D. Barilone, Budillon A. and Schirinzi G., "Compressive sampling in SAR tomography: results on COSMO-Skymed data", IEEE International Geoscience and Remote Sensing Letters, 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG3: Projects 3.1-3.4; WG4: Projects 4.1-4.6).

Italy

FRANCESCO SOLDOVIERI
Senior Research Scientist
CNR - National Research Council of Italy, IREA - Institute for Electromagnetic Sensing of the Environment
via Diocleziano 328, 80124 Napoli, Italy
Phone: +39 081 7620651 - Fax: +39 081 5705734
e-mail: soldovieri.f@irea.cnr.it

Biographical sketch

Francesco Soldovieri since 2001 is Research Scientist at IREA-CNR, where he is Senior Research Scientist from 2006. He has been member of Scientific Committees and Technical Review panels for the Intl. Conf.s on GPR from 2004, for Intl. Workshop on Adv. GPR from 2003, and for IGARSS from 2008. He was General Chair of the IWAGPR 2007 (Naples, Italy) and General Co-Chair at the Intl. Conf. on GPR 2010. He is member of the Editorial Board of six Journals, among them IEEE Geoscience and Remote Sensing Letters and of Journal of Geophysics and Engineering. He has been Technical/Scientific coordinator of the project FP7 ICT-SEC "Integrated System for Transport Infrastructures surveillance and Monitoring by Electromagnetic Sensing" and is now Coordinator of the AMISS, EU 7th Framework Marie Curie Actions IRSES project. His actual main scientific interests include EM diagnostics, inverse scattering, GPR applications, antenna diagnostics and characterization; sea state monitoring through X-band radar images. He is co-author of more than 150 papers on Journals, 8 chapters on books and more than 150 conference proceedings.

Main experience in the Action's topics

- Models and approaches for the EM forward scattering problems in 2D- and 3D geometry.
- Inverse scattering approaches using complete and/or aspect limited data for qualitative and quantitative imaging in complex two- and three- dimensional scenarios.
- Subsurface radar data processing via linear and non-linear microwave tomographic approaches.

Recent publications on the Action's topics

- Soldovieri F, Solimene R, Ahmad F, Sparse tomographic inverse scattering approach for through-the-wall radar imaging (2012) IEEE Trans. on Instr. & Meas., 61(12), 3340-3350
- Solimene R, Ahmad F, Soldovieri F, "A novel CS-TSVD strategy to perform data reduction in linear inverse scattering problems" (2012) IEEE Geosc. Rem. Sens. Let., 9(5), 881-885.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG3: Projects 3.2, 3.6; WG4: Projects 4.1-4.5).

Italy

RAFFAELE SOLIMENE
Assistant Professor in Electromagnetics
Seconda Università di Napoli
Dip. di Ingegneria Industriale e dell'Informazione
via Roma 29, 81031Aversa, Italy
Phone: +39 081 5010335 Fax: +39 081 5037042
e-mail: raffaele.solimene@unina2.it

Biographical sketch
Raffaele Solimene became assistant professor at the Faculty of Engineering of the University Mediterranea of Reggio Calabria in 2002. Since 2006, he has been with the Dipartimento di Ingegneria dell'Informazione. His scientific interest are in EM inverse source and inverse scattering problems, EM fields representation and EM information content, microwave tomography, GPR prospecting, TWI imaging, vital sign detection. On these topics he co-authored more than 120 scientific works and routinely serves as a reviewer for a number of journals and conferences. Since 2012 he is one of the associate editor for the special issues on "Non-invasive Sensing Techniques", International Journal of Geophysics. His research has been developed within several research projects. Among them, in 2009 he was the principal investigator for the project "Development of a novel method for through-wall imaging", funded by the European Office of Aerospace Research Development and from 2012 is the principal investigator of the MICENEA project - FIRB 2012, funded by the Italian Ministry of University and Research. He is a member of the National Interuniversity Consortium for Telecommunications and of Italian the Italian Society of Electromagnetics.

Main experience in the Action's topics
- GPR tomography algorithms.
- Vital sign detections algorithm.
- Clutter rejection methods and Soil Green' function estimation techniques.

Recent publications on the Action's topics
- R. Solimene, G. Ruvio, A. Dell'Aversano, A. Cuccaro, M. J. Ammann, and R. Pierri, "Detecting point-like sources of unknown frequency spectra," Progress In Electromagnetics Research B, Vol. 50, 347-364, 2013.
- A. D'Alterio, R. Solimene, "Accounting for Antenna in Half-Space Fresnel Coefficient Estimation," Intl J. of Geophysics, vol. 2012, pp. 1-11, doi: 10.1155/2012/138458, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
Leader of Project 3.2. WG Member (WG3: Project 3.2).

Italy

FABIO TOSTI
Researcher, Doctoral School of Civil Engineering
"Roma Tre" University - Department of Engineering
Via Volterra 62, 00146 Rome, Italy
Phone: +39 06 57333403
e-mail: fabio.tosti@uniroma3.it

Biographical sketch
Fabio Tosti received the M.Sc. and Eng. degree (cum laude) in *Road Transportation and Infrastructures* in 2010 at "Roma Tre" University, Rome, Italy. He is currently a Ph.D. student. His main interests are the uses of GPR and NDTs in civil engineering applications, particularly concerning maintenance and construction processes of road infrastructures. Furthermore, his current research interests include the development of GPR-based methods for hydrogeophysical and mechanical characterization of soils, also through the integration with others non-destructive techniques. During his Ph.D. he was hosted twice by the Delft Univ. of Tech. He participated to the ASTRI project, mainly focused on the physical and electromagnetic characterization of pavement structural courses. He is co-author of more than 20 publications in journals and proceedings. He is a reviewer for many journals. In 2013, he chaired the oral Session "Civil Engineering Applications of GPR" as co-convener of the Session. He is a member of the EGU, Soc. Italiana Infrastrutture Viarie.

Main experience in the Action's topics
- Time-efficient procedures for effective GPR surveying of large-scale road networks.
- Development of innovative inspection procedures for effective GPR mapping of bridges.
- GPR-based techniques for assessing subsurface volumetric water content.
- Electromagnetic characterization of subgrade clayey soils using GPR.

Recent publications on the Action's topics
- F. Tosti, C. Patriarca, E. Slob, A. Benedetto, S. Lambot, Clay content evaluation in soils through GPR signal proc., J. App. Geo., 2013, in press, doi:10.1016/j.jappgeo.2013.04.006.
- F. Benedetto, F. Tosti, "GPR spectral analysis for clay content evaluation by the frequency shift method," J. Applied Geophysics, 2013, in press, doi:10.1016/j.jappgeo.2013.03.012.
- C. Patriarca, F. Tosti, C. Velds, A. Benedetto, S. Lambot, E. Slob, "Frequency Dependent Electric Properties of Homogeneous Multi-phase Lossy Media in the Ground-Penetrating Radar Frequency Range," J. Applied Geophysics, 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
Leader of Project 2.5. WG Member (Projects 2.1-2.5).

Italy

FEDERICO VIANI
Post Doc in Electromagnetics
ELEDIA Research Center @ DISI, University of Trento
via Sommarive 5, I-38123 Trento, Italy
Phone.: +39 0461 28 5272
Fax: +39 0461 28 3166
e-mail: federico.viani@unitn.it

Biographical sketch
Federico Viani received the B.S. and M.S. degrees in Telecommunication Engineering from the University of Trento in 2005 and 2007, respectively and the PhD degree in Information and Communication Technologies from the International Doctorate School in Information and Communication Technology in 2010. He is currently a member of the ELEDIA Research Center at the Department of Information Engineering and Computer Science (DISI) of the University of Trento. His main interests are in Wireless Sensor Networks, antenna synthesis and design, and electromagnetic inverse scattering methodologies. Dr. Viani is a Member of the Institute of Electrical and Electronics Engineers (IEEE), and a member of the IEEE Antennas and Propagation Society, of the National Interuniversity Consortium for Telecommunications (CNIT), and of the Italian Society of Electromagnetics (SIEM).

Main experience in the Action's topics
- Numerical and experimental validation of GPR for detection and identification of targets.
- Design, fabrication and measurement of wideband and multiband antennas.
- Numerical modeling of complex structures for GPR scenarios validation.
- Development of methodologies for real-time processing and filtering of time and frequency domain data.

Recent publications on the Action's topics
- F. Viani, L. Poli, G. Oliveri, F. Robol, and A. Massa, "Sparse scatterers imaging through approximated multi-task compressive sensing strategies," Microwave Opt. Technology Lett., vol. 55, no. 7, pp. 1553-1558., Jul. 2013.
- L. Poli, G. Oliveri, F. Viani, and A. Massa, "MT-BCS-based microwave imaging approach through minimum-norm current expansion," IEEE Trans. Antennas Propag., in press.
- F. Viani, G. Oliveri, and A. Massa, "Compressive sensing pattern matching techniques for synthesizing planar sparse arrays," IEEE Trans. Antennas Propag., in press.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG3: Project 3.6; WG4: Projects 4.2, 4.4-4.6).

SALVATORE CAPOZZIELLO
INFN & University of Naples "Federico II", Naples, Italy
e-mail: capozziello@na.infn.it

Role in COST Action TU1208
WG Member (WG3: Project 3.1).

SIMONE CICCIA
Politecnico di Torino, Torino, Italy
e-mail: simone.ciccia@polito.it

Role in COST Action TU1208
WG Associate Member (WG1).

GIAN PIERO DEIDDA
University of Cagliari, Cagliari, Italy
e-mail: gpdeidda@unica.it

Role in COST Action TU1208
WG Member (WG3: Projects 3.2; WG4: Projects 4.1, 4.2, 4.4, 4.6).

MARIAFELICIA DE LAURENTIIS
INFN & University of Naples "Federico II", Naples, Italy
e-mail: felicia@na.infn.it

Role in COST Action TU1208
WG Member (WG3: Project 3.1).

PATRICIA DIAZ DE ALBA
University of Cagliari, Cagliari, Italy
e-mail: patriciadiazdealba@gmail.com

Role in COST Action TU1208
WG Member (WG3: Projects 3.2; WG4: Projects 4.1, 4.2, 4.4, 4.6).

CLAUDIO ESTATICO
University of Genoa, Genoa, Italy
e-mail: estatico@dima.unige.it

Role in COST Action TU1208
WG Member (WG3: Projects 3.2; WG4: Projects 4.1, 4.2, 4.4, 4.6).

LUISA FERMO
University of Cagliari, Cagliari, Italy
e-mail: fermo@unica.it

Role in COST Action TU1208
WG Member (WG3: Projects 3.2; WG4: Projects 4.1, 4.2, 4.4, 4.6).

CATERINA FENU
University of Cagliari, Cagliari, Italy
e-mail: kate.fenu@gmail.com

Role in COST Action TU1208
WG Member (WG3: Projects 3.2; WG4: Projects 4.1, 4.2, 4.4, 4.6).

GAETANO GIUNTA
Roma Tre University, Rome, Italy
e-mail: gaetano.giunta@uniroma3.it

Role in COST Action TU1208
WG Member (WG3: Project 3.4).

TOMMASO ISERNIA
Università Mediterranea di Reggio Calabria, Reggio Calabria, Italy
e-mail: tommaso.isernia@unirc.it

Role in COST Action TU1208
WG Member (WG3: Project 3.4).

WOLFGANG KUSAYANAGI
Roma Tre University, Rome, Italy
e-mail: wolfgang.kusayanagi@yahoo.com

Role in COST Action TU1208
WG Member (WG3: Project 3.1).

GIOVANNI LEONE
Seconda Università di Napoli, Naples, Italy
e-mail: vallaoras@yahoo.com

Role in COST Action TU1208
WG Member (WG3: Project 3.2).

GIUSEPPE LONGO
INFN & University of Naples "Federico II", Naples, Italy
e-mail: longo@na.infn.it

Role in COST Action TU1208
WG Member (WG3: Project 3.1).

NICOLA MASINI
Consiglio Nazionale delle Ricerche (CNR), Istituto per i Beni Archeologici e Monumentali (IBAM), Lecce and Potenza, Italy
e-mail: n.masini@ibam.cnr.it

Role in COST Action TU1208
WG Member (WG4: Project 4.1).

MAURIZIO PAOLILLO
INFN & University of Naples "Federico II", Naples, Italy
e-mail: paolillo@na.infn.it

Role in COST Action TU1208
WG Member (WG3: Project 3.1).

RAFFAELE PERSICO
Consiglio Nazionale delle Ricerche (CNR), Istituto per i Beni Archeologici e Monumentali (IBAM), Lecce and Potenza, Italy
e-mail: n.masini@ibam.cnr.it

Role in COST Action TU1208
Leader of Project 1.1. WG Member (WG1: Project 1.1; WG4: Project 4.1).

DANIELE PIRRONE
Roma Tre University, Rome, Italy
e-mail: e2gpr@gpradar.eu

Role in COST Action TU1208
WG Member (WG3: Project 3.1).

GIUSEPPE RODRIGUEZ
University of Cagliari, Cagliari, Italy
e-mail: rodriguez@unica.it

Role in COST Action TU1208
WG Member (WG3: Projects 3.2; WG4: Projects 4.1, 4.2, 4.4, 4.6).

CARMELO TULUMELLO
Provincia di Rieti, Rieti, Italy
e-mail: c.tulumello@provincia.rieti.it

Role in COST Action TU1208
WG Associate Member (WG2).

FRANCESCO F. VALERI
Provincia di Roma, Roma, Italy
e-mail: f.valeri@provincia.roma.it

Role in COST Action TU1208
WG Associate Member (WG2).

ABDALLAH AL ZOUBI
Princess Sumaya University for Technology, Amman, Jordan
e-mail: zoubi@psut.edu.jo

Role in COST Action TU1208
MC Observer from NNC. WG Associate Member (WG3).

Latvia

DANIIL OPOLCHENOV
Ph.D. Student
Transport and Telecommunication Institute
Department of Electronics and Telecommunications
1st Lomonosova street, Riga, Latvia
Phone: +371 22011509
e-mail: opolchenov.d@tsi.lv

Biographical sketch

Daniil Opolchenov is Transport and Telecommunication Institute Ph.D. student on "Telematics and Logistics" programme. His Ph.D. work is devoted to increasing of GPR data processing efficiency due to that he is interested in realization of algorithms of GPR data processing using FPGA and microcontrollers. He has Master Degree in Electronics. At this time he works in TTI laboratories of Telecommunication, electronics and robotic, conduct several subjects related to the design analog and digital electronic devices. He is the co-author of 4 articles on processing of GPR data theme. At free time works with students making small mobile robots.

Main experience in the Action's topics

- Processing of GPR data
- Solving of Inverse structural problem for radar subsurface probing

Recent publications on the Action's topics

- A. Krainyukov, D. Opolchenov, "Using genetic algorithm for solution of inverse structural problem for radar subsurface probing", Computer Modelling and New Technologies, 2010, Vol.14, No.1, 56–63
- A. Krainyukov, V. Kutev, D.Opolchenov , "Approach to hardware implementation of genetic algorithm for inverse problem of roadway coverage subsurface probing solution", Transport and Telecommunication, 2010, Volume 11, No 4, 14–28

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG Member (WG2: Projects 2.3, 2.5; WG4: Projects 4.3, 4.4).

Latvia

ALEXANDER KRAINYUKOV
Assistant Professor
Transport and telecommunication Institute
Department of Electronics and Telecommunications
1st Lomonosova Street, Riga, LV-1019, Latvia
Phone: +371 28316834
e-mail: krainukovs.a@tsi.lv

Biographical sketch
Alexander Krainyukov received the Dr. sc.ing. degree in Scientific area "Transport and Communication"from Riga Transport and Telecommunication Institute (Latvia) in 2014. Since 1980, his scientific activity was devoted to radar subsurface probing of sea ice, digital processing of ground penetrating radar (GPR) data. Alexander Krainyukov is co-author of about 50 scientific publications in this area. Now he works in Transport and Telecommunication Institute and his scientific activity as researcher is connected to roadway structure monitoring with using of GPR and algorithms of solving radar inverse problems for civil engineering applications.

Main experience in the Action's topics
- Subsurface probing of roadways by GPR.
- Digital processing of GPR data.
- Algorithms of solving radar inverse problems for civil engineering applications.

Recent publications on the Action's topics
- A. Krainyukov. (2014). Reconstruction of the Roadway Coverage Parameters by Radar Subsurface Probing. Summary of the Promotion Work. Riga: Transport and Telecommunication Institute, ISBN 978–9984–818–61-0, pp. 141. (in English).
- A. Krainyukov, V. Kutev, E. Andreeva. (2014). Using Bees Algorithms for Solution of Radar Pavement Monitoring Inverse Problem. Volume 15, No 1, pp. 53–66. Transport and Telecommunication Institute, Lomonosov 1, Riga, LV-1019, Latvia (in English).

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (Project 3.4).

Latvia

VALERY KUTEV
Professor, Dr.habil.sc.ing.
Transport and Telecommunication Institute
Department of Telecommunications and Electronics
1-st Lomonosova str., Riga, Latvia
Phone: +37167100634
e-mail: kutevs.v@tsi.lv

Biographical sketch
Valery Kutev received the Dr.habil.sc.ing. degree in Electrical Engineering from Riga Aviation University (Latvia) in 1993. Since 1971, his scientific activity was devoted to radar subsurface probing of fresh and sea ice, sand and peat soils, as well as application of radar imaging to geological and archaeological studies. Professor V. Kutev is co-author of 3 collective monographs, 8 certificates of inventions, about 130 scientific publications in this area. Now he works in Transport and Telecommunication Institute and his scientific activity as researcher is connected to roadway structure monitoring with using of ground penetrating radar (GPR).

Main experience in the Action's topics
- Subsurface probing of roadways by GPR
- Digital processing of GPR data
- Algorithms of solving radar inverse problems for civil engineering applications

Recent publications on the Action's topics
- Krainyukov, V. Kutev, E. Andreeva" Using Bees Algorithms for Solution of Radar Pavement Monitoring Inverse Problem". TRANSPORT and TELECOMMUNICATION, 2014, Vol. 15,No.1,pp. 53–66.
- A.Krainyukov, V.Kutev."Using of the adaptive algorithm for narrowing searching intervals in the inverse problem of roadway structure monitoring". Proceedings of the 14th International Conference "RELIABILITY and STATISTICS in TRANSPORTATION and COMMUNICATION (RelStat'14), 15-18 October 2014,Riga,Latvia,pp.165-176
- D.Opolchenov, V.Kutev." Artificial neural network adjustment for inverse problem of plate-layered media subsurface radar probing". Proceedings of the 14th International Conference "RELIABILITY and STATISTICS in TRANSPORTATION and COMMUNICATION (RelStat'14), 15-18 October 2014,Riga,Latvia,pp.186-191

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member, WG3 Member (Project 3.5).

Malta

SEBASTIANO D'AMICO
University of Malta
Physics Dept. University of Malta
Msida Campus
MSD2080 Msida, Malta
Tel. +35699573895
sebdamico@gmail.com

Netherlands

EVERT SLOB

Professor of Geophysical Electromagnetic Methods
Delft University of Technology, Dept. Geoscience & Engineering, Stevinweg 1, 2628 CN, Delft, the Netherlands, Phone.: +31 152788732
Fax: +31 152781189, e-mail: e.c.slob@tudelft.nl

Biographical sketch and Main ecperience in the Action's topics

Evert Slob received the M.Sc. degree in mining and petroleum engineering, and the doctorate degree (cum laude) in applied sciences from Delft University of Delft, Delft, The Netherlands, in 1989 and 1994, respectively. In 1995, he joined the Dept. of Applied Earth Sciences, TU Delft; currently he is professor of geophysical electromagnetic methods in the Department of Geoscience & Engineering. He is director of studies in Applied Earth Sciences. He is editor-elect for Geophysics (SEG) and associate editor for Near Surface Geophysics (EAGE). His current research interests are electromagnetic interferometry and methods for autofocusing, hydrogeophysics, advanced imaging and inversion techniques, heterogeneity determination, and soil characterization including the study of fundamental relations between geological and electromagnetic and electrokinetic properties. He published over 100 international peer reviewed journal papers on these subjects. Dr. Slob was the General Chair of the 10th International Conference on GPR in 2004. He organized ten international workshops and conference sessions and was guest editor for 11 special journal issues on GPR and hydrogeophysics.

Recent publications on the Action's topics

- Di Matteo, A, E. Pettinelli and E Slob (2013), Early-time GPR signal attributes to estimate soil electric permittivity: A theoretical study, IEEE Transactions on Geoscience and Remote Sensing, 51(3), 1643-1654.
- Wapenaar, K., F. Broggini, E. Slob and R. Snieder (2013), Three-dimensional single-sided Marchenko inverse scattering, data-driven focusing, Green's function retrieval, and their mutual relations, Physical Review Letters, 110(8), 084301.
- *J. Applied Geophysics*, SI on "Ground Penetrating Radar for nondestructive evaluation of pavements, bridges and subsurface infrastructures", A. Benedetto, A. Loizos, L. Pajewski and E. Slob, Eds., 2013.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. Leader of Project 3.2. WG Member (WG2: Projects 2.1, 2.3, 2.5; WG3: Projects 3.1- 3.4).

RALPH FELD
Delft University of Technology , Delft, the Netherlands
e-mail: r.feld@tudelft.nl

Role in COST Action TU1208
WG Associate Member (WG3).

SHILONG SUN
Delft University of Technology , Delft, the Netherlands
e-mail: s.sun@tudelft.nl

Role in COST Action TU1208
WG Associate Member (WG1).

ALEXANDER YAROVOY
Delft University of Technology , Delft, the Netherlands
e-mail: a.yarovoy@tudelft.nl

Role in COST Action TU1208
WG Member (WG1: Projects 1.1, 1.2).

Norway

EGIL EIDE
Chief Scientist
3d-Radar AS
Klæbuveien 196B, 7037 Trondheim, Norway
Phone.: +47 41691512
e-mail: egil@3d-radar.com

Biographical sketch
Egil Eide received his MSc degree in Electronics Engineering from Norwegian University of Science and Technology 1991, and his Ph.D. in Radar and Antenna Engineering from the same university in August 2000. He founded the company 3d-Radar in 2001 where he developed the Geoscope stepped-frequency GPR together with ultra-wideband antenna arrays for high resolution 3-dimensional GPR imaging. Egil Eide also is Adjunct Professor in Antenna Engineering at the Norwegian University of Science and Technology. His main research interests are in GPR system design, antenna engineering, radar signal processing, and 3-dimensional subsurface imaging techniques.

Main experience in the Action's topics
- Development of wideband GPR Antennas and array systems.
- Development of stepped-frequency GPR systems.
- RF-engineering, Radar System design (Ground Penetrating Radar).
- Radar signal processing.
- Geophysical data processing and three-dimensional subsurface imaging techniques.
- Antenna measurement and characterization.
- Application of Ground Penetrating Radar in civil engineering and archaeology.

Recent publications on the Action's topics
- E. Eide, T. Kiessling, and J. Typpö, "Wideband Antenna Array for Step-Frequency Ground Penetrating Radar", 14th International Conference on Ground Penetrating Radar (GPR 2012), Shanghai, China, June 4 - 8, 2012.
- J. Sala, H. Penne, and E.Eide, "Time-Frequency Dependent Filtering of Step-Frequency Ground Penetrating Radar Data", 14th International Conference on Ground Penetrating Radar (GPR 2012), Shanghai, China, June 4 - 8, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (WG1: Projects 1.1-1.2; WG2: Projects 2.1-2.3).

Norway

JACOPO SALA
Field Application Engineer and System Developer
3d-Radar AS
Brynsveien 13, 0667 Oslo, Norway
Phone.: +47 46626550
e-mail: jacopo@3d-radar.com

Biographical sketch
Jacopo Sala received his MSc degree in Telecommunications Engineering from Politecnico di Milano in 2007, his final work focusing on issues of polarization and positioning in GPR data. He joined 3d-Radar AS in January 2008 as Field Application Engineer. His main responsibilities are system integration, survey design and acquisition startegy, data processing and reporting. He is also part of the development team of 3d-Radar's processing software, 3dR Examiner. His main research interests are in radar signal processing and analysis, in particular related to step-frequency GPR data.

Main experience in the Action's topics
- Radar signal processing.
- Multi-channel, multi-offset GPR data processing
- Three-dimensional subsurface imaging techniques.
- Application of Ground Penetrating Radar in civil engineering and archaeology.

Recent publications on the Action's topics
- Sala, H. Penne, E.Eide, "Time-Frequency Dependent Filtering of Step-Frequency Ground Penetrating Radar Data", 14th International Conference on Ground Penetrating Radar (GPR 2012), Shanghai, China, June 4 - 8, 2012.
- J. Sala, N. Linford, "Processing stepped frequency continuous wave GPR systems to obtain maximum value from archaeological data sets", Near Surface Geophysics, Vol 10, No 1, February 2012, pp. 3 - 10.
- R. Persico, J. Sala, " Single and double sequence of investigation domains in 2D linear inversions applied to GPR data", IEEE Geoscience and Remote Sensing Letters, 2014.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Substitute Member. WG Member (WG2: Projects 2.1-2.3; WG3: Project 3.4).

Norway

INGE HOFF
Norwegian University of Science and Technology,
Trondheim, Norway
e-mail: inge.hoff@ntnu.no

Role in COST Action TU1208
MC Member.

JOSE RENEIRIO R. FEDERIZON
Geomaster Corp., Quezon City, Philippines
e-mail: butchfed@geomastercorp.com

Role in COST Action TU1208
MC Observer from IPC. WG Member (WG2: Projects 2.1-2.15; WG4: Projects 4.1-4.6).

Poland

TOMISLAV GOLEBIOWSKI
Researcher and Lecturer
Cracow University of Technology
Faculty of Environmental Engineering
Warszawska 24, zip code: 31-155, Cracow, Poland
Phone: +48 12 628-31-97
e-mail: goleb@wis.pk.edu.pl

Biographical sketch

Tomislaw Golebiowski received the following scientific degrees from AGH University of Technology (Cracow): MoS and Engineer degrees in Applied Geophysics (1996), PhD in Sciences of Earth (2005), Habilitation with specialisation in Geophysics (2013). During his studies he cooperated with "Polish Oil and Gas Institute" (Cracow) in petrophysics. In years 1996-2001 he worked in "PBG Geophysical Exploration Ltd." (Warsaw) in magnetotelluric surveys and in "IGSMiE Institute of Polish Academy of Science" (Cracow) in numerical modelling of geophysical and geomechnical processes. From 2001 to 2013 he was a researcher and lecturer in EM techniques and numerical modelling at AGH University of Science and Technology. Currently, he works in the Cracow University of Technology. He is the author of 2 books and author/co-author of more than 50 works in journals and conference proceedings. His main research interests are in application of electromagnetic methods (especially GPR) in mining, engineering and environmental studies.

Main experience in the Action's topics

- Voids and fractured zones detection using of GPR and microgravimetric methods.
- GPR and geomechanical modelling for interpretation of data from mining & urban areas.
- Ambiguities in GPR detection and monitoring of liquid contaminations in ground.
- GPR application in mining conditions with special attention for borehole surveys.

Recent publications on the Action's topics

- Golebiowski T., 2012. GPR Monitoring of Rock Mass Stability in Selected Post-Mining Region in Poland. Proceedings of Intl. Conf. of EGU General Assembly, Wien, Austria.
- Golebiowski T., Golebiowska B., Pieczka A., 2012. Geophysical Research for the Recognition of Polymetallic Mineralization in the Quarry in Redziny (Poland). Proceedings of International Conference of EGU General Assembly, Wien, Austria.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Substitute Member. WG Member (WG2: Project 2.3; WG4: Project 4.1).

Poland

LECH KRYSIŃSKI
Assistant Professor (Adjunct)
Road and Bridge Research Institute,
Pavement Diagnostic Division
Instytutowa str. 1, 03-302 Warsaw, Poland
Phone: +48 22 39 00 208 Fax: +48 22 814 50 28
e-mail: lkrysinski@ibdim.edu.pl

Biographical sketch
Lech Krysiński studied in Faculty of Physics at University of Warsaw. He received Doctorate in Physical Sciences from Institute of Geophysics at this faculty and he worked and taught there for 20 years (morphology of potential fields, gravity modelling, applied mathematics in geophysics). Now he is researcher in Road and Bridge Research Institute developing and implementing geophysical methods in pavement diagnostics.

Main experience in the Action's topics
GPR pavement diagnostics: layer thicknesses, detection and examination of cracks, assessment of the layer material properties. Development of dedicated measurement procedures and data-processing methods.

Recent publications on the Action's topics

- Lech Krysiński & Jacek Sudyka (2012): Typology of reflections in the assessment of the interlayer bonding condition of the bituminous pavement by the use of an impulse high-frequency ground-penetrating radar, Nondestructive Testing and Evaluation,
- Dariusz Sybilski; Wojciech Bańkowski; Jacek Sudyka; Lech Krysiński (2012), Reasons of Premature Cracking Pavement Deterioration – A Case Study, 7th RILEM International Conference on Cracking in Pavements; Mechanisms, Modeling, Testing, Detection and Prevention Case Histories, RILEM Bookseries, Volume4, ISBN978-94-007-4565-0
- Krysiński, L., Sudyka, J. (2013), GPR abilities in investigation of the pavement transversal cracks, Journal of Applied Geophysics, http://dx.doi.org/10.1016/j.jappgeo.2013.03.010.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. Leader of Project 2.4. WG Member (WG2: Projects 2.1, 2.3-2.5; WG4: Project 4.3).

Poland

MARIAN MARCINIAK
Professor at Kielce University of Technology
Professor at National Institute of Telecommunications
1 Szachowa Street, 04-894 Warsaw, Poland
Phone: +48 22 5128715 Fax: +482205128347
e-mail: marian.marciniak@ieee.org

Biographical sketch

Marian Marciniak in 1997 received his Doctor of Sciences degree in physics/optics from Warsaw University of Technology. Currently he is a professor at the National Institute of Telecommunications in Warsaw, and at Kielce University of Technology, Faculty of Electr. Eng., Automatics and Computer Science in Kielce, Poland. Since 2004 he serves as an Honorary International Advisor to the George Green Institute for Electromagnetics Research at the University of Nottingham, UK. Since 2002 he participates in the URSI – Intl. Union of Radio Science, Comm. D – Electronics and Photonics. He is one of the Editors-in-Chief for Springer Optical and Quantum Electronics. He is the Editorial Board Member for Microwave & Optoelectronics Technology Letters.

Main experience in the Action's topics

- Theory of electromagnetic waves and waveguiding phenomena.
- Beam Propagation Method modelling.

Recent publications on the Action's topics

- L. Pajewski, A. Benedetto, X. Derobert, A. Giannopoulos, A. Loizos, G. Manacorda, M. Marciniak, Ch. Plati, G. Schettini, I. Trinks, Applications of Ground Penetrating Radar in Civil Engineering – COST Action TU1208, 7th International Workshop on Advanced Ground Penetrating Radar IWAGPR 2013, July 2-5, 2013 Nantes (France).
- H.V. Baghdasaryan, T.M. Knyazyan, M. Marciniak, High Q-factor Fabry-Perot Microresonator as an Alternative to Microdisk in Electro-Optical Modulator for Microwave-Photonic Receivers, J. of Telecomm. and Information Tech., Issue 2/2013.

Participation to other COST Actions

Chair of the COST Action MP0702 "Towards Functional Sub-Wavelength Photonic Structures". Member of the following COST Actions, in Physics and ICT (1993 till now): 288, P11, 291, 2100, IC0602, IC0802, IC1004, IC1101, MP1204, MP1302, MP1401, MP1403.

Role in COST Action TU1208

- MC Member. Short-Term Scientific Missions Manager. Financial Rapporteur. WG Member (WG3: Project 3.1).

Poland

JACEK SUDYKA
Researcher in Electromagnetics
Road and Bridge Research Institute
Instytutowa 1, 03302 Warsaw, Poland
Phone: +48 22 6980606 Fax: +48 22 8145028
e-mail: jsudyka@ibdim.edu.pl

Biographical sketch

Jacek Sudyka received a M.Sc. in Environmental Engineering from Agricultural University in Krakow, Poland. He is a Researcher in Pavements and vice-chief of Pavement Diagnostic Division in Road and Bridge Research Institute, Warsow Poland. He is an author/co-author of more than 50 publications in international journals and conference proceedings, coordinator of projects for national road authorities on using GPR technique in detection of asphalt pavement damages and projects on evaluation of road networks using modern, non-destructive test methods. His main research interests are GPR and its applications in pavement infrastructure. He is coordinator of a project under Operational Program Innovative Economy, Activity 2.1 entitled Mobile Laboratory For The Non-Destructive Pavement Characteristics Quantification, secretary of the Technical Committee TC 212 of the Polish Committee for Standardization.

Main experience in the Action's topics

- Applications of Ground Penetrating Radar in pavement damage localisation.
- Use of non-destructive methods in assessment of the pavement condition.

Recent publications on the Action's topics

- L. Krysiński, J. Sudyka, "GPR abilities in investigation of the pavement transversal cracks," Special Issue "Ground Penetrating Radar for non-destructive evaluation of pavements, bridges and subsurface infrastructures" J. of Appl. Geo., editorial stage, 2013.
- L. Krysiński, J. Sudyka,."Typology of reflections in assessment of the condition of interlayer bonding of the bituminous pavement by the use of an impulse high frequency ground penetrating radar," Civil Engineering Applications of Ground Penetrating Radar, Taylor & Francis Journal "Nondestructive Testing and Evaluation", 2012.

Participation to other COST Actions

COST Action 354 "Performance indicators for road pavements" (ended in July 2008).

Role in COST Action TU1208

MC Substitute Member. WG Member (WG2: Projects 2.1, 2.3-2.5; WG4: Project 4.3).

Poland

JERZY KARCZEWSKI
University of Science and Technology – Akademia Górniczo-Hutnicza im. Stanisława Staszica, Kraków, Poland
e-mail: karcz@agh.edu.pl

Role in COST Action TU1208
WG Associate Member (WG1-WG4).

LIDIA ŻAKOWSKA
Cracow University of Technology, Cracow, Poland
e-mail: lzakowsk@pk.edu.pl

Role in COST Action TU1208
WG Associate Member (WG2). Local Organiser of the Training School on "GPR Applications in Urban Areas: the sensitive case of historical cities" (2015).

Portugal

FRANCISCO MANUEL CARVALHO PINTO FERNANDES
Researcher in Civil Engineering
University of Minho
Campus de Azurém, 4800-058 Guimarães, Portugal
Phone: +351 253 510 200 Fax: +351 253 510 217
e-mail: fmcpf@civil.uminho.pt

Biographical sketch
Francisco Manuel Carvalho Pinto Fernandes graduated in civil engineering in 2001 from University of Minho. He received his Ph.D. degree from University of Minho in 2006 with a thesis on the assessment of historical masonry structures using GPR and controlled drilling. He was a Post-Doc researcher between 2007 and 2009, having carried out consultancy works and research on the use of GPR on pavements. Currently, he is an integrated member of the ISISE – Institute for Sustainability and Innovation in Structural Engineering group. Since 2009, he holds a position as Assistant Professor at the Engineering and Technologies Faculty of the Lusíada University, in Portugal. He is the responsible investigator of a research project "Improved and innovative techniques for the diagnosis and monitoring of historical masonry" financed by FCT – Fundação para a Ciência e Tecnologia.

Main experience in the Action's topics
- Applications of GPR in civil engineering, mainly masonry and concrete structures, and road pavements.

Recent publications on the Action's topics
- Sena-Cruz, J., Ferreira, R.M., Ramos, L., Fernandes, F.M., Miranda, T. e Castro, F. (2013). "Luiz Bandeira Bridge: assessment of a historical RC bridge." International Journal of Architectural Heritage, 7(6), 628-652.
- Fernandes, F.M., Ramos, L.F., Manning, E., Ferreira, J., Mendes P. (2013). "Multi-technique approach for the assessment of historical masonry constructions." Em 10th International Conference on Damage Assessment of Structures (DAMAS 2013), Dublin, Ireland.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Substitute Member. WG Member (WG2: Projects 2.1, 2.2 and 2.5).

Portugal

LUISA MARIA DA SILVA GONÇALVES
Researcher in Remote Sensing
Polytechnic Institute of Leiria - Department of Civil Engineering
Campus 2 – Morro do Lena- Alto Vieiro, Leiria, Portugal
Phone: +351 244820300 Fax: +351 244820310
e-mail: luisa.goncalves@ipleiria.pt

Biographical sketch
Luisa Maria da Silva Gonçalves holds a degree in Geomatic Engineering from the University of Coimbra, a MSc in Geographical Information Systems (GIS) from the Instituto Superior Técnico (IST), Technical University of Lisbon and a PhD degree in Civil Engineering, the scientific area of Urban, Regional Planning and Transportation from the University of Coimbra. Currently, she is an associate professor in the Department of Civil Engineering of the School of Technology and Management of the Polytechnic Institute of Leiria (ESTG-IPLeiria). She is a member of the Institute of Systems and Computer Engineering of Coimbra (INESC Coimbra) and collaborator of the Institute of Structural Engineering, Planning and Construction (ICIST). Coordination and participation as a team member in research and development projects, consultancy studies ordered by public institutions and companies.

Main experience in the Action's topics
- Development of metothologies to automatcally extract infromation from satelite images.
- Applications of image processing tecniques for structural assessment.
- Processing and modeling the uncertainty information.

Recent publications on the Action's topics
- Valença, J., Gonçalves, L., Júlio, E. "Damage Assessment on Concrete Surfaces using Multi-spectral Image Analysis", Construction and Building Materials, 40: 971–981, March 2013.
- Gonçalves, L. M. S., C. C. Fonte, E. N. B. S. Júlio, M. Caetano, 2012. Uncertainty measures application in the training and evaluation of supervised classifiers, Intl. J. of Remote Sensing.
- Gonçalves, L. M. S., C. C. Fonte, E. N. B. S. Júlio, M. Caetano, 2010. "Evaluation of soft possibilistic classifications with non-specificity uncertainty measures", International Journal of Remote Sensing, 31, (19): 5199-5219.

Participation to other COST Actions
COST Action TU1206 (MC Member) and FP1304 (MC Member).

Role in COST Action TU1208
MC Member. WG Member (WG3: Project 3.4; WG4: Projects 4.1, 4.4, 4.6).

Portugal

JORGE PAIS
Researcher in Road Pavements
University of Minho - Department of Engineering
4800-058 Guimaraes, Portugal
Phone: +351 253 510208 Fax: +351 253 510217
e-mail: jpais@civil.uminho.pt

Biographical sketch

Jorge Pais is Associate Professor of the Department of Civil Engineering at the University of Minho (UM) in Portugal. Dr. Pais worked as research assistant with the pavement research group at the UM. He holds Bachelors (1990) and Masters (1993) degrees in Civil Engineering from University of Porto in Portugal. Since 2012 he has been -head of the Department of Civil Engineering. Jorge Pais research areas include pavement materials design and characterization, advanced laboratory testing, field performance evaluation and maintenance and rehabilitation techniques. In the materials area, he has been involved in fatigue, reflective cracking, cracking propagation, asphalt rubber hot mixes characterization. Jorge Pais is author or co-author of more than 150 papers in international and national journals and conferences, some of them cited by the ISI. He has been invited to review manuscripts from some international journals in road pavements area. He has been involved in several national research projects and participated in the organization of scientific events, mainly in the scientific committee of 23 conferences.

Main experience in the Action's topics

- Numerical techniques for the localization of buried structures from GPR data.
- Applications of GPR in civil engineering and characterization of road pavements.
- Synthesis, analysis and experimental characterization of antennas.

Recent publications on the Action's topics

- Brovelli, C., Crispino, M., Pais, J.C., Pereira, P.A.A., "Assessment on fatigue resistance of modified asphalt concrete incorporating fibers and polymers", ASCE Journal of Materials in Civil Engineering. Aceite para publicação em 11 de abril de 2013.
- Cojocaru, R., Pais, J.C., Andrei, R., Budescu, M., "Modeling of Airport Rigid Pavement Structure Made of RCC and Recycled Cement Concrete for Complex Configuration of Landing Gears". Advanced Materials Research, Vol. 649, (2013)

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG Member (WG2: Projects 2.1, 2.2, 2.5; WG4: Project 4.3).

SIMONA FONTUL
National Laboratory for Civil Engineering, Lisbon, Portugal
e-mail: simona@lnec.pt

Role in COST Action TU1208
MC Substitute Member. Leader of Project 4.3. WG Member (WG2: Projects 2.1, 2.3-2.5; WG4: Projects 4.1-4.3, 4.5, 4.6).

VANIA MARECOS
National Laboratory for Civil Engineering, Lisbon, Portugal
e-mail: vmarecos@lnec.pt

Role in COST Action TU1208
WG Member (WG1: Project 1.1; WG3: Projects 3.1-3.4).

DAGOS ENE
Researcher at Optoelectronic methods and techniques for cultural heritage rehabilitation and conservation department.National Institute of R & D for Optoelectronics, INOE 2000 Atomistilor 409 Str. Magurele, Romania Phone.: +40314056398
Fax: +40214574522 e-mail: dragos@inoe.inoe.ro

Biographical sketch
Graduated in 2007 Faculty of Electronics, Telecommunication and Information Technology, University of Polytechnics from Bucharest. In 2011 he received PhD in Physics, the title of the thesis being Non-contact optical methods for monitoring monuments conservation status. He is working as a researcher at INOE 2000, with main activities regarding imagistic techniques for investigation of cultural heritage, involving radar investigations, 3D laser scanning and printing and laser Doppler vibrometry.

Main experience in the Action's topics
- Applications of Ground Penetrating Radar in civil engineering;
- Investigation on several archaeological sites, dated as Eneolithic, Roman, ByzantineMedieval.
- 3D numerical data processing and visualization.

Recent publications on the Action's topics
- D. Ene, R. Radvan, "Comparison of radar exploration from ground and low altitude for fast archaeological dissemination," Optoelectronics and Advanced Materials-Rapid Communications, 2011, Vol 5(7), pp. 806-808.
- C. Lazar, D. Ene, V. Parnic, D.N. Popovici, M. Florea, "Ground Penetrating Radar Prospections in Romania. Mariuta-La Movila Necropolis, A Case Study", Mediterranean Archaeology & Archaeometry, 2011, Vol 11(2), pp. 79-89.
- M. Simileanu, W. Maracineanu, J. Striber, C. Deciu, D. Ene, L. Angheluta, R. Radvan, R. Savastru, "Advanced research technology for art and archaeology-ART4ART mobile laboratory", Journal of Optoelectronics and Advanced Materials, 2008, Vol. 10(2), pp. 470-473.

Participation to other COST Actions
COST Action TD0902-SPLASHCOS-Submerged Prehistoric Archaeology and Landscapes of the Continental Shelf (2009 to 2013).

Role in COST Action TU1208
MC Member. WG Member (WG2: Projects 2.2-2.5; WG4: Projects 4.1-4.5).

Romania

SEBASTIAN STAN
Teaching Assistant at Ion Mincu University of
Architecture and Urbanism Bucharest
Department of Basics of Architectural Design
18-20 Academiei st., 010014, Bucharest, ROMANIA
Phone.: +40314056398
e-mail: sebastian.stan.arh@gmail.ro

Biographical sketch
Graduated the Faculty of Architecture, Ion Mincu University of Architecture and Urbanism from Bucharest in 2008, the title of the graduation project being Mobile Center for Noninvasive Archeology. In 2012 he received a PhD in Architecture, the title of the thesis being The Dynamics of Bucharest Interstices:1813 – 1946.He is working as a practicing architect and a teaching assistant at Ion Mincu University of Architecture and Urbanism from Bucharest, with main activities regarding the history of architecture and architectural design pedagogy.

Main experience in the Action's topics
- Research of Ground Penetrating Radar's aplicability in restoration and civil engineering;
- Investigation on the Neolithic archaeological site from Sultana-Malul Roşu;
- ReSITUS Metode şi tehnici avansate de conservare şi reconstrucţie digitală pentru patrimoniul cultural - istoric imobil (Advanced Methods and Techniques of Digital Preservation and Reconstruction for the Immobile Historical and Cultural Heritage), CERES 2 CEX project 06-8-73 2006-2008;

Recent publications on the Action's topics
- C. Lazăr, T. Ignat, S. Stan, K. Moldoveanu, F. Rădulescu, Beyond The Archaeological Imagination. Observations About Kodjadermen-Gumelniţa-Karanovo VI Architecture Based On A Study Of Experimental Archaeology în Mediterranean Arhaeology and Archaeometry, Vol. 12, No 2, pp. 55-79.
- S. Stan, From the Aquatic limit to the Architecture of the Cognitive Transcendent: A Pilot centre for Non-invasive Archaeology, graduation dissertation, Ion Mincu University of Architecture and Urbanism Bucharest, 2008.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (WG2: Projects 2.2-2.5; WG4: Projects 4.1-4.5).

Russia

SERGEY I. IVASHOV

Head of Remote Sensing Laboratory
Bauman Moscow State Technical University
5, 2nd Baumanskaya str. Moscow 105005 Russia
Phones: +7 (499) 263-65-09; +7 (495) 632-22-19
Fax: +7 (495) 632-22-19
e-mail: sivashov@rslab.ru

Biographical sketch

Sergey I. Ivashov graduated with honors from Moscow Institute of Physics and Technology (MIPT) in 1972. Right after graduation he joined the post-graduate course in MIPT. As a post-graduate he submitted the thesis for a PhD degree in 1975. He worked as a scientific researcher in rocket industry of the USSR. Since 1977 up to 2000 he was working in the Central Scientific and Research Institute of Radio & Electronic systems, Moscow, as a scientific researcher and thereafter he has been promoted to a laboratory head position. From 2000 up to now, he is the head of the Remote Sensing Laboratory, Bauman Moscow State Technical University, Russia. S. Ivashov was rewarded with the Russian Federation government's prize in the field of science and technology for creation of the RASCAN holographic subsurface radar technology and devices. He is a member of editorial board of an International Journal "Sensing and Imaging". S. Ivashov was a member of International Advisory Committee of the XIV International Conference on Ground Penetrating Radar, GPR 2012, and now he is a member of Scientific Committee at the 8th IWAGPR.

Main experience in the Action's topics

Development of holographic subsurface radars of RASCAN type for structures surveying.

Recent publications on the Action's topics

- S. Ivashov, V. Razevig, I. Vasiliev, T. Bechtel, L. Capineri, Holographic subsurface radar for diagnostics of cryogenic fuel tank thermal insulation of space vehicles, NDT & E International, Vol. 69, January 2015, Pages 48-54.
- Sergey Ivashov, Vladimir Razevig, Igor Vasiliev, Andrey Zhuravlev, Timothy Bechtel, Lorenzo Capineri, Non-Destructive Testing of Rocket Fuel Tank Thermal Insulation by Holographic Radar, Proc. of the 6th Intl. Symposium NDT in Aerospace, Spain, 2014.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Observer from NNC. WG Member (WG1: Project 1.1).

DMITRY EDEMSKIJ
Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation (IZMIRAN), Russian Academy of Sciences, Moscow, Russia
e-mail: edemsky@list.ru

Role in COST Action TU1208
MC Observer from NNC. WG Associate Member (WG1).

VLADIMIR KOPEIKIN
Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation (IZMIRAN), Russian Academy of Sciences, Moscow, Russia
e-mail: kopeikin@izmiran.ru

Role in COST Action TU1208
MC Observer from NNC. WG Associate Member (WG1).

PAVEL MOROZOV
Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation (IZMIRAN), Russian Academy of Sciences, Moscow, Russia
e-mail: pmoroz5@yandex.ru

Role in COST Action TU1208
MC Observer from NNC. WG Associate Member (WG1).

ALEXEI POPOV
Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation (IZMIRAN), Russian Academy of Sciences, Moscow, Russia
e-mail: popov@izmiran.ru

Role in COST Action TU1208
MC Observer from NNC. WG Member (WG3: Project 3.1). WG Associate Member (WG1).

Russia

IGOR PROKOPOVICH
Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation (IZMIRAN), Russian Academy of Sciences, Moscow, Russia
e-mail: prokop21@mail.ru

Role in COST Action TU1208
MC Observer from NNC. WG Member (WG3: Project 3.1).

CELESTIN TWIZERE
National University of Rwanda, Butare, Rwanda
e-mail: celestintwizere@yahoo.fr

Role in COST Action TU1208
MC Observer from IPC. WG Member (WG2: Projects 2.2, 2.3, 2.5; WG3: Projects 3.1, 3.4).

Serbia

IVAN ALARGIĆ
Ph.D. student of Geodesy and geomatics
Faculty of technical sciences
Trg Dositeja Obradovića 6, 21000 Novi Sad, Serbia
Phone: +381 21 485 2260
e-mail: alargic@uns.ac.rs

Biographical sketch
Ivan Alargić received his Master's degree of Science in Electrical and Computer Engineering in 2008 from University of Novi Sad, Faculty of technical sciences. He is currently Ph.D. student of Geodesy and geomatics. He works as associate at Department for Computing and Automatics at Geospatial Technologies and Systems Centre in field of digital terrain modelling, detection of underground utility and determination of soil structure (GPR), cartography and spatial data visualization.

Main experience in the Action's topics
- Modelling of state and structure of slope processes using GNSS and technologies of laser and GPR scanning.
- Detection and mapping of waterline and sewage in the area of city Novi Sad.

Recent publications on the Action's topics
- Sladić, D.;Vrtunski, M.;Alargić, I.;Ristić, A.;Petrovački, D.,Development of geoportal for landslide monitoring, Bulletin of the Serbian geographical society, Faculty for geography, Belgrade, 2012, ISSN:0350-3593.
- Badnjarević, I.; Govedarica, M.;Alargić, I.; Pajić, V.; The application of object oriented classification for e-government services in local municipality, International Conference on Methodologies, Technologies aand Tools Enabling e-Government MeTTeG12 (6; Beograd; 2012).
- Alargić, I.;Badnjarević, I.;Vrtunski, M.;Popov, S.; Setting the platform for testing the quality of DTM in the format of DTM-ASCII, IEEE International Symposium on Intelligent Systems and Informatics (SISY) Subotica, Serbia, 8, 2010, ISBN: 978-1-4244-7395-3.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.3, 2.5; WG3: Project 3.4).

Serbia

MIRO GOVEDARICA

Professor
Faculty of technical sciences
Trg Dositeja Obradovića 6, 21000 Novi Sad, Serbia
Phone: +381 21 485 2258
e-mail: miro@uns.ac.rs

Biographical sketch

Miro Govedarica received the PhD degree in Geoinformatics and information systems in 2001 at Faculty of technical sciences, Novi Sad. He is founder (2003) of the Geospatial Technologies and Systems Center (GTSC). From 1994 he is full time employee at Faculty of technical sciences, and from 2012 he works as professor of geoinformatics, remote sensing, geospatial services at Department for geospatial technologies. He participated in the project of development and implementation of first GPS permanent stations network in Serbia, in 2003. From 2003, he participated in more than 40 projects directly related to GPR applications. His current research interests include development of innovative inspection procedures for GPR surveying of underground utilities in urban areas, development of advanced GPR data processing techniques and development of advanced methods for joint processing of data collected by GPR and other non-destructive testing techniques. He runs the studying program Geodesy and geomatics at Faculty of technical sciences.

Main experience in the Action's topics

Modelling of state and structure of slope processes using GNSS, GPR and laser scanning technologies. Model of the flooding banks state based on geo-information technologies, systems and GPR. GNSS based GPR applications

Recent publications on the Action's topics

- Ristić A., Petrovački D., Govedarica M. : A New Method to Simultaneously Estimate the Radius of a Cylindrical Object and the Wave Propagation Velocity from GPR Data, Computers & Geosciences, 2009, Vol. 35, No 8, Page 1620-1630, ISSN 0098-3004.
- Ristić Aleksandar, Abolmasov B., Govedarica M., Petrovački D., Ristić Aleksandra: Shallow-landslide spatial structure interpretation using a multi-geophysical approach, Acta Geotechnica Slovenica, 2012.
- Govedarica, M., Petrovački, D., Sladić, D., Radulović, A., Jovanović, D., Pajić, V., Vrtunski, M., Ristić Aleksandar, Environmental Data in Serbian Spatial Data Infrastructure - Geoportal of Ecology, Journal of Environmental Protection and Ecology, 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG Member (WG2: Projects 2.3, 2.5; WG3: Projects 3.2).

Serbia

DUŠAN PETROVAČKI
Professor
Faculty of technical sciences
Trg Dositeja Obradovića 6, 21000 Novi Sad, Serbia
Phone: +381 21 485 2259
e-mail: petrovacki@uns.ac.rs

Biographical sketch

Professor Dušan Petrovački is Head and founder (2003) of the Geospatial Technologies and Systems Center (GTSC) and former Dean of Faculty of Technical sciences (1991-1998). Also, he was Regional secretary (Vojvodina/Serbia) for Science and Technology (2002-2004). He received his PhD degree in 1979, at Faculty of technical sciences, Novi Sad. His research interests include theory of control and optimization in industrial process, and applications of geospatial and information technologies in various fields. He lead the project of development and implementation of first GPS permanent stations network in Serbia, in 2003. He participated in 10 international projects (UNDP, MSF (US), DOE (US), Academia Sinica (China), British Council, Erasmus University Rotterdam (Netherlands), EUPOS Berlin). He is IEEE society member. He published more than 150 papers in journals and scientific conferences proceedings (including 40 related to GPR). His current research interests include quantitative estimation of EM and physical properties from GPR data with development of advanced GPR data processing techniques.

Main experience in the Action's topics

Modelling of state and structure of slope processes using GNSS, GPR and laser scanning technologies. Model of the flooding banks state based on geo-information technologies, systems and GPR. GNSS based GPR applications.

Recent publications on the Action's topics

- Ristić A., Petrovački D., Govedarica M. : A New Method to Simultaneously Estimate the Radius of a Cylindrical Object and the Wave Propagation Velocity from GPR Data, Computers & Geosciences, 2009, Vol. 35, No 8, Page 1620-1630, ISSN 0098-3004
- Ristić Aleksandar, Abolmasov B., Govedarica M., Petrovački D., Ristić Aleksandra: Shallow-landslide spatial structure interpretation using a multi-geophysical approach, Acta Geotechnica Slovenica, 2012
- Govedarica, M., Petrovački, D., Sladić, D., Radulović, A., Jovanović, D., Pajić, V., Vrtunski, M., Ristić Aleksandar, Environmental Data in Serbian Spatial Data Infrastructure - Geoportal of Ecology, Journal of Environmental Protection and Ecology, 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG2: Project 2.3; WG3: Project 3.2).

Serbia

ALEKSANDAR RISTIĆ
Assistant Professor
Faculty of technical sciences
Trg Dositeja Obradovića 6, 21000 Novi Sad, Serbia
Phone: +381 21 485 2258
e-mail: aristic@uns.ac.rs

Biographical sketch
Aleksandar Ristić received the PhD degree in Electrical engineering and geo-informatics in 2009 at Faculty of technical sciences, Novi Sad, with thesis "Parameter estimation of underground cylindrical objects and surrounding soil using GPR data". From 2009 he works as assistant professor of (1) Underground utility detection by GPR and EML, (2) Geo sensor networks, (3) Control systems in geomatics, at Department for geospatial technologies. He participated in the project of development and implementation of first GPS permanent stations network in Serbia, in 2003From 2003, he participated in more than 50 projects directly related to GPR applications. His current research interests include development of innovative inspection procedures for GPR surveying of underground utilities in urban areas, and quantitative estimation of EM and physical properties from GPR data with development of GPR data processing techniques. He runs the lab. for sub-terrestrial remote sensing.

Main experience in the Action's topics
Modelling of state and structure of slope processes using GNSS, GPR and laser scanning technologies. Model of the flooding banks state based on geo-information technologies, systems and GPR. GNSS based GPR applications.

Recent publications on the Action's topics

- Ristić A., Petrovački D., Govedarica M. : A New Method to Simultaneously Estimate the Radius of a Cylindrical Object and the Wave Propagation Velocity from GPR Data, Computers & Geosciences, 2009, Vol. 35, No 8, pp. 1620-1630, ISSN 0098-3004
- Ristić Aleksandar, Abolmasov B., Govedarica M., Petrovački D., Ristić Aleksandra: Shallow-landslide spatial structure interpretation using a multi-geophysical approach, Acta Geotechnica Slovenica, 2012
- Govedarica, M., Petrovački, D., Sladić, D., Radulović, A., Jovanović, D., Pajić, V., Vrtunski, M., Ristić Aleksandar, Environmental Data in Serbian Spatial Data Infrastructure - Geoportal of Ecology, Journal of Environmental Protection and Ecology, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.3, 2.5; WG3: Project 3.4).

Serbia

MILAN VRTUNSKI
Ph.D. student of Geodesy and geomatics
Faculty of technical sciences
Trg Dositeja Obradovića 6, 21000 Novi Sad, Serbia
Phone: +381 21 485 2260
e-mail: milanv@uns.ac.rs

Biographical sketch
Milan Vrtunski received the M.Sc. degree in Electrical engineering and computer science in 2006 at Faculty of technical sciences, Novi Sad. He is currently Ph.D. student. He works as assistant at Department for geospatial technologies and teaches exercises in subjects related to application of GPR, GNSS and other geoinformation technologies. He published a number of papers in journals and scientific conferences proceedings. Also, he participated in more than 20 projects directly related to GPR applications. His current research interests include development of advanced methods for joint data acquisition by GPR and other ND technologies, processing of data and application of GPR for determination of soil structure with volumetric moisture content

Main experience in the Action's topics
Modelling of state and structure of slope processes using GNSS and technologies of laser and GPR scanning. Model of the flooding banks state based on geoinformation technologies, systems and GPR. Detection and mapping of waterline and sewage. Detection and mapping of mid-pressure gas line.

Recent publications on the Action's topics

- Sladić, D.; Vrtunski, M.; Alargić, I.; Ristić, A.; Petrovački, D.; Development of geoportal for landslide monitoring, Bulletin of the Serbian geographical society, Faculty for geography, Belgrade, 2012, ISSN: 0350-3593
- Govedarica, M., Petrovački, D., Sladić, D., Radulović, A., Jovanović, D., Pajić, V., Vrtunski, M., Ristić Aleksandar, Environmental Data in Serbian Spatial Data Infrastructure - Geoportal of Ecology, Journal of Environmental Protection and Ecology, Vol. 13, No. 3A, Str. 1990-1997, ISSN: 1311-5065, 2012.
- Vrtunski, M.; Govedarica, M.; Ristić, A.; Petrovački, D. : An Example Of GNSS Application In Non-Ideal Conditions, International Symposium on Global Navigation Satellite Systems, Space-Based Augmentation Systems and Applications, Berlin, Germany, 2011

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.3; WG3: Projects 3.2).

DUŠAN KOCUR
Professor
Department of Electronics and Multimedia Communications, Faculty of Electrical Engineering and Informatics, Technical University of Kosice Letná 9, 04120 Košice, Slovak Republic
Phone: +421 55 602 4233 - E-mail: dusan.kocur@tuke.sk

Biographical sketch
Dušan Kocur is Full Professor of Electronics and Communication Engineering. at the Technical University of Košice, Slovakia. His main interests include ultra-wideband (UWB) radar signal processing for through obstacles detecion, localization and tracking of moving people, monitoring of breathing activities of human beings and real-time performing wireless UWB sensor networks. He has given lectures on Wireless UWB Sensor Networks, Spread Spectrum Communication Systems and Circuit Theory.

Main experience in the Action's topics
- Through the wall localization of tag free objects.
- Detection, localization and tracking of human beings by UWB radar systems.
- Monitoring of breathing activities of human beings.
- Real-time UWB radar signal processing for human being detection, localization and tracking.
- Wireless UWB sensor networks.

Recent publications on the Action's topics
- P. Kažimír, J. Fortes, D. Kocur, D. Novák. Simple 3D Localization of Tag-Free Moving Targets by UWB Radar. The 15th International Radar Symposium, Gdansk, Poland, 2014.
- P. Kažimír, D. Kocur, J. Fortes, Jana, R. Zetik. Localisation of Motionless Persons in 3D Space by UWB Radar. PIERS: Progress In Electromagnetics Research Symposium, August 25-28, 2014, Guangzhou, China. - Cambridge: The Electromagnetics Academy, 2014.
- P. Kažimír, D.Kocur, J. Fortes, D. Novák, R. Zetik. A Simple Approach to Through Wall Localization of Persons Moving in 3-Dimensional Space. EuMW 2014: European Microwave Week: Connecting the Future. Conference Proceedings, Rome, Italy, Oct 2014.

Participation to other COST Actions
COST Actions 289, IC0803, IC1301, IC1303.

Role in COST Action TU1208
MC Member. WG Member (WG3: Project 3.4; WG4: Project 4.2).

JANA FORTES
Faculty of Electrical Engineering and Informatics,
Technical University of Kosice, Košice, Slovak Republic
E-mail: Jana.Fortes@tuke.sk

Role in COST Action TU1208
MC Member. WG Associate Member (WG3).

DANIEL NOVAK
Faculty of Electrical Engineering and Informatics,
Technical University of Kosice, Košice, Slovak Republic
E-mail: daniel.novak@tuke.sk

Role in COST Action TU1208
WG Member (WG4: Project 4.2).

Slovenia

ANDREJ GOSAR
Professor of Applied Geophysics
University of Ljubljana,
Faculty of Natural Sciences and Engineering
Aškerčeva 12, SI-1000 Ljubljana, Slovenia
Phone.: +386 1 4787274, Fax: +386 1 4787295
e-mail: andrej.gosar@gov.si

Biographical sketch
Andrej Gosar obtained his B.S. degree in geology in 1987 and his M.S. and Ph.D. degrees in geophysics in 1993 and 1997, respectively, from the University of Ljubljana, Slovenia. He is currently a Professor of applied geophysics and seismology at the Faculty of Natural Sciences and Engineering, the University of Ljubljana and a Director of Seismology and Geology Office, Slovenian Environment Agency. Dr. Gosar's areas of expertise include seismology, earthquake hazard, seismic site effects, microtremor method, seismotectonics, high-resolution seismic reflection method and GPR method. He serves as the National Representative to the International Association of Seismology and Physics of the Earth Interior, the European Seismological Commission, and the Society of Exploration Geophysicists and as a Member of Scientific Board of UNESCO International Geoscience Programme (IGCP) – Team Leader for Geohazards. He is a member of editorial boards of international journals ISRN Geophysics and The Scientific World Journal.

Main experience in the Action's topics
- Applications of GPR in study of active tectonics, karst research and geotechnical hazards.
- Integration of high-resolution seismic reflection and Ground Penetrating Radar data.
- Analysis and experimental characterization of low-frequency Rough Terrain Antennas.

Recent publications on the Action's topics
- Gosar, A. 2012: Analysis of the capabilities of low frequency ground penetrating radar for cavities detection in rough terrain conditions: the case of Divača cave, Slovenia. Acta carsologica, vol. 41, no. 1, 77-88.
- Zajc, M., Pogačnik, Ž., Gosar, A. 2013: Ground Penetrating Radar and structural geological mapping investigation of karst and tectonic features in flyschoid rocks as geological hazard for exploitation- the case of Rodež open pit mine (Anhovo, W Slovenia. Int. Journal of Rock Mechanics and Mining Sciences, in press.

Participation to other COST Actions
COST Action 625 "3-D monitoring of active tectonic structures".

Role in COST Action TU1208
MC Member. Participant of WG2 (Project 2.3) and WG4 (Projects 4.4, 4.5).

Spain

ALFREDO GARCIA GARCIA
Professor
Universitat Politècnica de València
Camino de Vera, s/n, 46071-Valencia, Spain
Phone: +34 963877374 Fax: +34 963877379
e-mail: agarciag@tra.upv.es

Biographical sketch
Alfredo Garcia is Professor of highway engineering from 2002 and Director of Transportation and Territory Research Institute. He is an expert in highway geometric design, traffic engineering, road safety, and traffic calming. He has presented 130 conference papers, published more than 75 papers in leading international journals and 14 books, and holds 3 patents. He is member of several international technical committees and editorial boards. His main research topics are: Road Safety; Geometric Design; Traffic Calming; Passing Maneuvers; Speed Limits; Operating Speed Model; Roundabout Metering Signals; Skewed Intersection; Deceleration Lanes; Traffic Conflict Techniques; Overlapping of Curves; Design Consistency; Adverse Weather and Safety; Driving Simulator; Vulnerable Road Users; Conductivity of Asphalt Concrete; Magnetic Asphalt Concrete; Use of Ceramic Wastes from Tile Industry in Asphalt Concrete Surface Course. ResearcherID: I-2388-2012; Orcid: 0000-0003-1345-3685; Scopus ID: 7404607965.

Main experience in the Action's topics
- Development of new conductive and magnetic asphalt concrete for road pavement.
- GPR applicability on magnetic and conductivity asphalt concrete pavement.

Recent publications on the Action's topics
- Peinado, F., Medel, E., Silvestre, R., and García, A. Open-grade wearing course of asphalt mixture containing ferrite for use as ferromagnetic pavement. Composites Part B: Engineering. V. 57, pp. 262-268, 2014.
- Silvestre, R., Medel, E., García, A. and Navas, J. Using ceramic wastes from tile industry as a partial substitute of natural aggregates in hot mix asphalt binder courses. Construction and Building Materials. Vol. 45, pp. 115-122, 2013.
- Silvestre, R., Medel, E., García, A. and Navas, J. Utilizing recycled ceramic aggregates obtained from tile industry in the design of open graded wearing course on both laboratory and in situ basis. Materials & Design. Vol. 50, pp. 471-478, 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (Project 4.3).

Spain

HENRIQUE LORENZO
Department of Natural Resources & Environmental Engineering, University of Vigo
Campus A Xunqueira s/n, 36005 Pontevedra, Spain
Phone: +34 986 801 906, Fax: +34 986 801 907
e-mail: hlorenzo@uvigo.es

Biographical sketch
Henrique Lorenzo received his MSc in Geodesy, 1989, and PhD in Geophysics, 1994, from the Complutense University of Madrid. He worked on civil engineering applications and archaeological site investigation using ground-penetrating radar. His current research interests include traffic infra-structures survey, 3D GPR imaging, and the joint use of close-range techniques (photogrammetry and laser scanner) together with GPR for cultural heritage documentation and evaluation. His present position is full time Lecturer and Head of the Department of Natural Resources Engineering, University of Vigo (Spain).

Main experience in the Action's topics
Applications of Ground Penetrating Radar in civil engineering.

Recent publications on the Action's topics
- Solla, M., González-Jorge, H., Varela, M., and Lorenzo, H. (2012). "GPR for the Inspection of In-Road Structures and Data Interpretation by Numerical Modeling." J. Constr. Eng. Manage., 10.1061/(ASCE)CO.1943-7862.0000644 (Sep. 27, 2012).
- Solla, M., Riveiro, B., Lorenzo, H., and Armesto, J. (2013). "Ancient Stone Bridge Surveying by Ground-Penetrating Radar and Numerical Modeling Methods." J. Bridge Eng., 10.1061/(ASCE)BE.1943-5592.0000497 (Apr. 8, 2013).
- H Lorenzo, P Arias, J Armesto, B Riveiro, M Solla, H, González-Jorge, C Caamaño, J Martínez, M Álvarez, S Lagüela, I Puente, L Díaz-Vilariño, M Varela. Ten years of applying geomatics to construction engineering in Spain: a review. Dyna 79 (175E), 129-146, 2012
- M Solla, H Lorenzo, FI Rial, A Novo. Ground-penetrating radar for structural evaluation of masonry bridges: results and limitations. Construction and Building Materials 29 (12), 458-465, 2012

Participation to other COST Actions
No.

Role in COST Action TU1208
- MC Member. WG Member (WG2: Project 2.1; WG4: Projects 4.1, 4.3).

Spain

RAÚL MÍNGUEZ
Technical Director
GEOFISICA CONSULTORES, S.L.
Ricardo León 33, 28250 Torrelodones, Madrid, Spain
Phone: +34 91 859 6136 - Fax: +34 91 859 1975
e-mail: r.minguez@geofisica-consultores.es

Biographical sketch
Raul Minguez, degree in Geological Sciences, specialized in Hydrogeology, Geophysics and Geological Engineering. PhD courses in the Geodynamic Department of the Geological Sciences Faculty at Universidad Complutense of Madrid. Since then, he has held and intense professional activity while working on research projects at the same time, being centered in GPR applications for Civil engineering. During his professional activity, he has participated in over five hundred projects on geophysics, half of them related with GPR. On the research side, he has participated and directed research projects with universities, large companies and research centers, developing new applications of geophysical techniques. The last two research projects in which he has been working on have been focused in applications of three-dimensional Step-frequency GPR technology for evaluating linear infrastructures such as roads and railways. He is a member of the Association Geoscientists & Engineers (EAGE) and the World Road Association. He is also a member of the Applied Geophysics section of the Spanish National Geodesy and Geophysics Commission since 2011.

Main experience in the Action's topics
Automatic ballast reflector tracing system. Ballast fouling estimation,, wet spot detection, for road layer thicknes determination. Tunnel lining, road defect identification, concrete structure inspection, geotechnical applications, utility detection.

Recent publications on the Action's topics
- R. Mínguez (2012), "Application of Multifrequency Geo-radar 3D as a high performance tool to detect areas of humidity concentrations in linear projects". RUTAS Intl. J. of World Road Association (Mondiale de la Route)
- S. Sandoval, R. Mínguez, & E. Nestares (2011). "Multidisciplinary Study of a Ballast Collapse in a High-Speed Railway Track in Spain". 6th international conference, AGE applied geophysics for environment and territorial system engineering.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.1-2.3, 2.5; WG4: Project 4.3).

Spain

XAVIER NÚÑEZ NIETO
Researcher in Applied Ground Penetrating Radar
University of Vigo – Defense Center University
Spanish Naval Academy
Plaza de España 2, 36920 Marín, Spain
Phone.: +34 986 804925, e-mail: xnnieto@cud.uvigo.es

Biographical sketch
Xavier Núñez Nieto is a professor at the Defense Center University (Naval Spanish Academy) and a PhD student at the University of Vigo, in Spain, whose research is based on the application of Ground Penetrating Radar supported by diverse other nondestructive techniques (NDT) such as Close-range Photogrammetry or Infrared Thermography, and also by numerical simulation (FDTD), appropriately joint with the aim to detect, evaluate and reconstruct the internal behavior and structural geometry of civil constructions, underground space andfor security and defense applications. He has collaborated in several works on the topic of GPR, including archaeological prospection, civil engineering and military applications and has already published a recent study based on the use of Ground Penetrating Radar to document moist areas in masonry on the conference proceedings of the 8th Portuguese and Spanish Assembly of Geodesy and Geophysics (8ALEGG). He is currently working as an active member of the Applied Geotechnologies Research Group of the University of Vigo, that has been recognized as a reference collective by the Galician Government not only due to its scientific production but also because of its human training development and knowledge transfer in the field of Geotechnologies.

Main experience in the Action's topics
Applications of Ground Penetrating Radar in civil engineering and in underground space.

Recent publications on the Action's topics
- X. Núñez-Nieto, M. Solla, R. Asorey-Cacheda, B. Riveiro. "Documentation of moisture content in masonry by means of GPR". Proceedings of the 8th Portuguese and Spanish Assembly of Geodesy and Geophysics (8ALEGG). Évora (Portugal), 29-31 January, 2014, pp. 233-238, ISBN 978-989-98836-0-4.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.1, 2.2; WG4: Projects 4.1-4.3).

Spain

VEGA PÉREZ-GRACIA
Researcher in Geophysics
Politechnical University of Catalonia (BarcelonaTech)
Dpt. of Strength of Materials and Structural Engineering, c/Urgell 187, 08036 Barcelona, Spain
Phone: +34 93 4137333 / +34 93 4137403 Fax: +34 93 4137401 - e-mail: vega.perez@upc.edu

Biographical sketch
Vega Pérez-Gracia received PhD in Earthquake Engineering and Structural Dynamics from the Polytechnic University of Catalonia (BarcelonaTech). She is a Researcher NDT, in the GIES research group (Geophysics and Earthquake Engineering) and holds the Mechanical Systems course at Polytechnic University of Catalonia. She is author or co-author of more than 100 works on journals, books and conference proceedings. She is member of the Applied Geophysical Section in the Spanish Geodesy and Geophysical Commission, and member of the Spanish Society for Non Destructive Testing. Her main research interests are GPR and its applications, Non-Destructive Testing evaluations mainly in cultural heritage, integrated geophysical surveys, seismic waves analysis and seismic risk assessment.

Main experience in the Action's topics
- Application of GPR in civil engineering, archaeology and cultural heritage.
- Experimental characterization of antennas.
- Laboratory tests to associate GPR images to physical properties.
- Comparing GPR data to other geophysical survey results.

Recent publications on the Action's topics
- V. Pérez-Gracia, R. González-Drigo, R. Sala, "Ground-penetrating radar resolution in cultural heritage applications", Near Surface Geophysics, Vol. 10(1), pp 77-87, 2012.
- J. Pedret, V. Pérez-Gracia, "Estudio de la sensibilidad del Ground Penetrating Radar al contenido en huecos de las mezclas bituminosas en pavimentos de carreteras. (Study of Ground Penetrating Radar sensitivity to asphalt mixtures void content in road pavements.", Revista Ingenieria de Obras Civiles-RIOC, Vol. 1, pp. 5-18, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Substitute Member. Leader of Project 2.2. WG Member (WG2: 2.2; WG4: 4.1, 4.4). WG Associate Member (WG3). Local Organiser WG Meeting May 2014.

Spain

LUIS G. PUJADES

Researcher in Earthquake Eng., Seismology and Applied Geophysics. Politechnic University of Catalonia – UPC – Barcelona Tech., Department of Geotechnical Engineering and Geosciences, Jordi Girona 1-3, D2 Building, 08034 Barcelona, Spain.
Phone: +34 93 4017258 Fax: +34 93 4017251
e-mail: lluis.pujades@upc.edu

Biographical sketch

Luis G. Pujades is Professor of Seismology and Earthquake Engineering at the Civil Engineering School of the Polytechnic Univ. of Catalonia. He is currently Director of the PhD at the Department of Geotechnical Engineering and Geosciences. His research focuses on Seismology, Earthquake Engineering and Applied Geophysics. He has participated in over 25 competitive research projects, including three European projects, and has been Chair for 14 of them. He is author/co-author of more than 250 research works published in books, journals and conference proceedings. He is member of the editorial committee of Tectonophysics and has been referee for numerous journals. He is a member of the Governing Council of the Geological Inst. of Catalonia. He is also member of the following scientific societies: Spanish Association of Earthquake Engineering, Seismological Society of America, American Geophysical Union and Earthquake Engineering Research Institute.

Main experience in the Action's topics

- Applications of Ground Penetrating Radar (GPR) in civil engineering.
- Applications of GPR with other NDT methods

Recent publications on the Action's topics

- Pérez-Gracia V., D. Di Capua R. González-Drigo, L.G. Pujades (2009). Laboratory characterization of a GPR antenna for high-resolution testing: Radiation pattern and vertical resolution. NDT & E International 42(4), 336-344.
- Pérez-Gracia V., O. Caselles, J. Clapés, R. Osorio, J.A. Canas, L.G. Pujades (2009). Radar exploration applied to historical buildings: A case study of the Marques de Llió palace, in Barcelona (Spain). Engineering Failure Analysis 16, 1039–1050.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG4: Projects 4.1, 4.2).

Spain

VICTOR SALINAS

PhD student in Earthquake Engineering
Politechnical University of Catalunya - Department of Engineering
Jordi Girona Street, 1-3, 08034 Barcelona, Spain
Phone: +34 93401 7378
e-mail: victor.salinas@upc.edu

Biographical sketch

Victor Salinas received the Laurea degree in *Physics* from University of Barcelona, Spain, and the Master Degree in Geophysics from University of Barcelona and Ramon Llull University. He is nowadays a PhD student in Earthquake Engineering and Structural Dynamics. He is the author/co-author in several journals and conference proceedings. His main research interests are seismic zonation and combined geophysical methodologies. He is working currently with Ground Penetrating radar and seismic methods, comparing results and developing integrated surveys in cities, applying these techniques to seismic risk evaluations and shallow geological studies. He was working with different research groups in Mexico and Almería.

Main experience in the Action's topics

- Applications of Ground Penetrating Radar in civil engineering.
- Synthesis, analysis and experimental characterization of antennas.
- Combination of GPR technic with other geophysical methods.

Recent publications on the Action's topics

- V. Pérez-Gracia, D. Di Capua, R. González-Drigo, O. Caselles, L.G. Pujades, V. Salinas, "GPR resolution in Cultural Heritage applications", Proc. GPR2010, PR_17, Lecce, Italia.
- V. Salinas, S. Santos-Assunçao, O. Caselles, V. Pérez-Gracia, Ll. G. Pujades, J. Clapés, "Effects on the predominant periods due to abrupt lateral soil heterogeneities", proceedings of WCEE 2012, 1441, Lisbon, Portugal. 24-28 September.
- Salinas, V., J.O. Caselles, V. Pérez-Gracia, D. Gonzalez-Drigo, J. Clapes, Ll. Pujades and J.A. Canas, "Nanozonation in dense cities: testing a combined methodology in Barcelona city (Spain)". Journal of Earthquake Engineering. 2013.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Member (WG4: Projects 4.1-4.6).

Spain

SÓNIA SANTOS ASSUNÇÃO
Researcher in Seismic engineering and structural dynamics, Universitat Politecnica de Catalunya - Department of Strength of Materials and Structural Engineering. Carrer Compte d' Urgell, 187. 08036 Barcelona. Phone: +34 673783727
e-mail: sonia.assuncao@upc.edu

Biographical sketch
Sónia Santos Assunção received the bachelor degree in Geophysics, Meteorology and Oceanography from The University Of Aveiro, Portugal. During the bachelor studied within the ERAMUS program in Aristotle University of Thessaloniki, Greece. She did the official master in Geophysics in Universitat de Barcelona. From the beginning of the PhD, she has been researching in GPR field in the heritage, archeology and engineering applications in Spain, Chile and Paraguay. In parallel she is developing algorithm using Matlab software to obtain further information about amplitude and frequency through wavelets in scattering observed in field. On the other hand, she is simulating in laboratory GPR phenomena and responses to a better soil characterization.

Main experience in the Action's topics
- Development of wavelet algorithms to map zones with high scattering.
- Applications of Ground Penetrating Radar in archaeology and civil engineering.
- Analysis and experimental characterization of antennas in laboratory.

Recent publications on the Action's topics
- V. Salinas, J.O. Caselles, V. Pérez-Gracia, Sonia, D. González-Valenzuela, J. Clapés, Ll. Pujades y J.A. Cañas. "Methodology for nanozonation of dense cities in the city of Barcelona". 15th World conference on earthquake engineering. Lisbon, Portugal.
- S. Santos Assunçao, V. Pérez-Gracia. "Ground Penetrating Radar – Methodology applied to transport section". 2 ª National Conf. of Non destructives techniques. Oporto, Portugal.
- Sonia Santos Assunçao, Jose Pedret Rodes,Vega Pérez-Gracia. "Ground Penetrating Radar – Railways inspection" 75th EAGE Conference 2013.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG4: Projects 4.1-4.6).

Spain

MERCEDES SOLLA
Researcher in Applied Ground Penetrating Radar
University of Vigo – Dept. Materials Engineering, Applied Mech.s & Construction School of Industrial Engineering. Av Jaime Janer 132 5F, 36900 Marin, Pontevedra, Spain - Phone: +34 69 9419032
e-mail: merchisolla@uvigo.es

Biographical sketch
Mercedes Solla received obtained the PhD Degree (with Honours) at the University of Vigo in Spain with an research based on the application of NDT techniques. She has published more than 25 works on books and journals, and more than 50 works on conference proceedings. She has been working for more than 7 years in the Close Range Photogrammetry and Remote Sensing or recently recalled Applied Geotechnologies Research Group at the University of Vigo, which has been recognized as a reference group and competitive research group (2012) by the Galician Government.

Main experience in the Action's topics
- Applications of Ground Penetrating Radar in civil engineering.
- FDTD numerical modelling to improve interpretation of the GPR signal.

Recent publications on the Action's topics
- M. Solla, S. Lagüela, B. Riveiro, H. Lorenzo. Non-destructive testing for the analysis of moisture in the masonry arch bridge of Lubians (Spain). Structural Control and Health Monitoring (2013). Published online in Wiley Online Library (DOI: 10.1002/stc.1545).
- M. Solla, H. González-Jorge, M. Varela, H. Lorenzo. Ground-Penetrating Radar for Inspection of In-Road Structures and Data Interpretation by Numerical Modeling. J. of Construction Eng. and Management 2013. DOI: 10.1061/(ASCE)CO.1943-7862.0000644
- M. Solla, B. Riveiro, H. Lorenzo, J. Armesto. Ancient Stone Bridge Surveying by GPR and Numerical Modeling Met.s. J. Bridge Eng. 2013 DOI: 10.1061/(ASCE)BE.1943-5592.0000497

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Substitute Member. WG4 Vice-Chair. WG Member (WG2: Project 2.1; WG4: Projects 4.1, 4.3). WG3 Associate Member.

Spain

JOAQUIN ANDREU
Polytechnic University of Valencia, Valencia, Spain
e-mail: ximoand@upv.es

Role in COST Action TU1208
WG Member (WG4: Projects 4.4, 4.5).

PEDRO ARIAS-SANCHEZ
University of Vigo, Vigo, Spain
e-mail: parias@uvigo.es

Role in COST Action TU1208
WG Member (WG2: Project 2.1; WG4: Projects 4.1, 4.3).

JOSÉ A. CANAS
Universidad Politécnica de Catalunya, Barcelona, Spain
e-mail: josep.antoni.canas@upc.edu

Role in COST Action TU1208
WG Member (WG4: Projects 4.1-4.6).

ORIOL CASELLES
Universidad Politécnica de Catalunya, Barcelona, Spain
e-mail: oriol.caselles@upc.edu

Role in COST Action TU1208
WG Member (WG4: Projects 4.1-4.6).

Spain

JAIME CLAPÉS
Universidad Politécnica de Catalunya, Barcelona, Spain
e-mail: ximoand@upv.es

Role in COST Action TU1208
WG Member (WG4: Projects 4.1, 4.2).

BELÉN LARUMBE GONZALO
92.Public University of Navarra, Pamplona, Spain
e-mail: luipalru@cst.upv.es

Role in COST Action TU1208
WG Associate Member (WG1, WG4).

LUIS PALLARÉS RUBIO
Polytechnic University of Valencia, Valencia, Spain
e-mail: luipalru@cst.upv.es

Role in COST Action TU1208
WG Member (WG1: Project 1.1).

JAANA GUSTAFSSON
Tyrens
Geotechnical Department
Peter Myndes Backe 16
118 86 Stockholm
Sweden
Phone: +702128052
e-mail: jaana.gustafsson@tyrens.se

Role in COST Action TU1208
MC Member.

Switzerland

LUCA GAMMA
Researcher
University of Applied Sciences and Arts of Southern Switzerland
Laboratory of Telecom, Telemetry and High-Frequency
Galleria 2, CH-6928 Manno, Switzerland
Phone: +41 58 666 65 98 Fax: +41 58 666 65 17
e-mail: luca.gamma@supsi.ch

Biographical sketch
Luca Gamma was born in Locarno, Switzerland, on September the 26th, 1973. He graduated in electrical engineering (dipl. ing. STS/ATS) from the Scuola Tecnica Superiore (STS) in 1997. After a research program in microelectronics he worked for two years in the smart card security domain. In 2001 he started collaborating with the University of Applied Sciences and Arts of Southern Switzerland (SUPSI) in research projects in the domains of embedded system, system integration, telemetry and GNSS. Collaboration with SUPSI continues nowadays along with a university' spin-off active in the design of environment monitoring systems using distributed sensor networks and remote management infrastructures (data center, processing and publishing).

Main experience in the Action's topics
- Software development for 2D/3D imaging (ITK/VTK).
- Hardware design from prototype to production PCBs.
- Software design from firmware to user interface.

Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. Vice-Chair of WG1. WG Member (WG1: Projects 1.1, 1.2).

Switzerland

JOHANNES HUGENSCHMIDT
Scientist and specialist for NDT
Rapperswil University of Applied Science
Oberseestrasse 10 CH-8640 Rapperwil, Switzerland
Phone: +41 222 4795
e-mail: johannes.hugenschmidt@hsr.ch

Biographical sketch
Johannes Hugenschmidt received his diploma (Master) in geophysics from Freie Universität Berlin/Germany in 1989, a Master of Business Administration (MBA) from St. Gallen University/Switzerland in 2003 and a PhD from the Swiss Federal Institute of Technology (ETH), Zurich, Switzerland. Johannes Hugenschmidt has three years of professional experience in seismic data processing and software development from Ensign Geophysics Ltd. in Weybridge/ UK, three years of experience in groundwater modeling from Simultec AG in Meilen/Switzerland and eighteen years of experience in non-destructive testing using GPR, first with Empa in Dübendorf/Switzerland and Rapperswil University of Applied Science/ Switzerland. Johannes Hugenschmidt's main interest is the adaption of geophysical methods for the non-destructive testing of transport infrastructure.

Main experience in the Action's topics
- Adaption of geophysical methods for the NDT of transport infrastructure.
- NDT using GPR on roads, bridges, retaining walls, railway lines and in tunnels.
- Development of algorithms and software for the processing of GPR data.
- Approaches for the evaluation of material properties (i.e. chloride in concrete).

Recent publications on the Action's topics
- Hugenschmidt J., Kasa C. and Kato H. GPR for the inspection of industrial railway tracks, Near surface geophysics, paper accepted.
- Kalogeropoulos A., van der Kruk J., Hugenschmidt J., Busch S., Merz K. (2011) Chlorides and moisture assessment in concrete by GPR full waveform inversion, Near Surface Geophysics, 9: 277-286.
- J. Hugenschmidt, A. Kalogeropoulos, F. Soldovieri, G. Prisco (2010) Processing Strategies for high-resolution GPR Concrete Inspections, NDT & E International, 43(4): 334-342.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (WG2: Projects 2.1, 2.5).

RICARDO MONLEONE
Professor
University of Applied Sciences and Arts of Southern Switzerland
Laboratory of Telecom, Telemetry and High-Frequency
Galleria 2, CH-6928 Manno, Switzerland
Phone: +41 58 666 65 37 Fax: +41 58 666 65 17
e-mail: ricardo.monleone@supsi.ch

Biographical sketch
Ricardo Monleone has been working in the electronic industry since 1986, where he has participated to and managed many large R&D projects. At present, he is the Managing Director of MEET Ltd (Coldrerio, Switzerland) and a Full Professor with the University of Applied Sciences of Southern Switzerland (SUPSI) in Manno (Switzerland). At SUPSI, he is involved with the acquisition and management of many research projects and gives lectures in "High Frequency Electronic Design", "Applied Electromagnetic Fields" and "Low Power Systems". He holds two patents. He is a senior member of IEEE and has co-authored various papers on journals and IEEE conferences. His main interest areas are microwave systems and sensors, non-destructive material testing and imaging, antennas design.

Main experience in the Action's topics
- Design of microwave hardware and antennas for ND materials testing and imaging.
- Development of high-resolution signal analysis algorithms.

Recent publications on the Action's topics
- R. Monleone, et al., Chapter for Book: "Microwave Materials Characterization", Title: "Nondestructive Evaluations by Using a Prototype of a Microwave Tomograph", 2012.
- M. Maffongelli, R. Monleone, M. Pastorino, S. Poretti, A. Randazzo, A. Salvadè, "Reconstruction of Metallic Inclusions Inside Dielectric Tragets by Means of a Microwave Tomographic System", IEEE Microwave and Wireless Components Letters, July, 2012.
- R. Monleone, A. Randazzo, M. Pastorino, A. Salvadè, "Experimental Reconstructions of Dielectric Targets with Metallic Inclusions by Microwave Imaging", "Advanced Electromagnetics Symposium", AES 2012, Paris, France, 16-19 April, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Associate Member (WG2, WG4).

Switzerland

SAMUEL PORETTI
Researcher
University of Applied Sciences and Arts of Southern Switzerland
Laboratory of Telecom, Telemetry and High-Frequency
Galleria 2, CH-6928 Manno, Switzerland
Phone: +41 58 666 65 99, Fax: +41 58 666 65 17
e-mail: samuel.poretti@supsi.ch

Biographical sketch
Dsfs Samuel Poretti was born in Bioggio, Switzerland on June 2, 1981. He received the degree in electrical engineering (Dipl. El. Ing.) from the University Of Applied Science in Southern Switzerland (SUPSI) in 2003 with specialization in telecommunications. Since 2003 he works as researcher in SUPSI Telecom Telemetry and High Frequency laboratory (TTHF). At SUPSI, he is involved with various research projects in the field of high frequency (Electromagnetic simulations, antenna and high frequency systems design, microwave systems and sensors, non-destructive material testing and wireless communication systems) and he teaches Telecommunications laboratories.

Main experience in the Action's topics
- Antenna design in MHz to GHz frequency range (microstrip and mechanical).
- High-frequency circuit design and simulation.
- Non-invasive microwave-based material charaterisation.

Recent publications on the Action's topics
- R. Monleone, M. Pastorino, S. Poretti, A. Randazzo, A. Massimini, A. Salvadè, Chapter for Book: "Microwave Materials Characterization", Chapter Title: "Nondestructive Evaluations by Using a Prototype of a Microwave Tomograph", 2012.
- M. Maffongelli, R. Monleone, M. Pastorino, S. Poretti, A. Randazzo, A. Salvadè, "Reconstruction of Metallic Inclusions Inside Dielectric Tragets by Means of a Microwave Tomographic System", IEEE Microwave and Wireless Components Letters, July, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG1 Associate Member (WG1, WG4).

Switzerland

ANDREA SALVADÈ
Professor
University of Applied Sciences and Arts of Southern Switzerland
Laboratory of Telecom, Telemetry and High-Frequency
Galleria 2, CH-6928 Manno, Switzerland
Phone: +41 58 666 65 37, Fax: +41 58 666 65 17
e-mail: andrea.salvade@supsi.ch

Biographical sketch

Andrea Salvadè from 1988 to 1993 was with Siemens AG in Zurich. Since 1993 he is with the Dpt. of Computer Science and Elect. Eng. of the Scuola Universitaria Professionale della Svizzera Italiana (SUPSI), where he teaches digital systems, telecommunications and high frequency and where he was active within the Laboratory of Microelectronics leading and participating in various applied research projects and where he is responsible for industry contacts. He is since 2002 manager of the "Telecom Telematics and High Frequency" LAB and project-leader of many projects in the design wireless microwave sensors and telecom systems, RFID and GNSS systems. He founded and is since 2002 managing director of the TIsolutions Sagl company. He is since 2004 Professor SUPSI. He is since 2007 in the direction board of the new SUPSI "ISEA Institute" for applied electronics and systems.

Main experience in the Action's topics

- Design of telecommunication systems.
- Design of non-invasive characterisation systems based on microwaves technology.

Recent publications on the Action's topics

- R. Monleone, M. Pastorino, S. Poretti, A. Randazzo, A. Massimini, A. Salvadè, Chapter for Book: "Microwave Materials Characterization", Chapter Title: "Nondestructive Evaluations by Using a Prototype of a Microwave Tomograph", 2012.
- M. Maffongelli, R. Monleone, M. Pastorino, S. Poretti, A. Randazzo, A. Salvadè, "Reconstruction of Metallic Inclusions Inside Dielectric Tragets by Means of a Microwave Tomographic System", IEEE Microwave and Wireless Components Letters, July, 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Associate Member (WG1, WG4).

DANIELE INAUDI
Smartec, Lugano-Manno, Switzerland
E-mail: daniele.inaudi@smartech.ch

Role in COST Action TU1208
WG Associate Member (WG1).

MANUEL LUESCHER
University of Applied Sciences and Arts of Southern Switzerland, Lugano-Manno, Switzerland
E-mail: manuel.luescher@supsi.ch

Role in COST Action TU1208
WG Associate Member (WG1).

Turkey

SELMA KADIOGLU
Teaching Staff in Applied Geophysics
Ankara University - Department of Geophysical Engineering
Degol St., 06100 Ankara, Turkey
Phone: +90 312 2033380 Fax: +90 312 2120071
e-mail: selma.kadioglu@ankara.edu.tr

Biographical sketch
Selma Kadioglu is a teaching staff in Geophysical Engineering Department of Ankara University, and a researcher in Earth Sciences Application and Research Center of Ankara Univ. She is the author/co-author of more than 100 works on national and international books, journals and conference proceedings. She is national editor of "Geophysics", UCTEA Chamber of Geophysical Engineers in Turkey. Kadioglu's main research interests are in Ground Penetrating Radar and its applications such as archaeogeophysics, defining geological structures, buried infrastructures, 3D visualization, forward- and inverse scattering; seismic wavefield computation and data processing. She is a member of UCTEA Chamber of Geophysical Engineers in Turkey, EGU, EAGE.

Main experience in the Action's topics
- Applications of GPR and Other NDT In Civil Engineering. GPR data processing.

Recent publications on the Action's topics
- Kadioglu, S., " Transparent 2d/3d half bird's-eye view of ground penetrating radar data set in archaeology and cultural heritage, Chapter 5, " Imaging and Radioanalytical Techniques in Interdisisplinary Research-Fundamentals and Cutting Edge Applications, Ed. by Faycal Kharfi, Published by InTech, Croatia, http://dx.doi.org/10.5772/54998, ISBN 978-953-51-1033-0, March 2013.
- Kadioglu, S., Kadioglu, M., Kadioglu, Y.K., "Identifying of buried archaeological remains with ground penetrating radar, polarized microscope and confocal Raman spectroscopy methods in ancient city of Nysa, Aydin – Turkey", Journal of Archaeological Science, 40 (2013), 3569-3583, 2013.
- Kadioglu, S. and Ulugergerli, E.U., "Imaging carstic cavities in transparent 3D volume of the GPR data-set in Akkopru Dam, Mugla-Turkey", Non-Destructive Testing and Evalution, Special Issue on Civil Engineering Applications of Ground Penetrating Radar, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. WG Member (WG3: Project 3.4; WG4: Projects 4.1, 4.4).

Turkey

GOKHAN KILIC

Assistant Professor BSc (Hons), MSc, PhD, CEng
Izmir University of Economics
Faculty of Engineering & Computer Science
Department of Civil Engineering
Fax: +90 (232) 279 26 26
Phone: +90 (534) 333 22 99
e-mail: gokhan.kilic@ieu.edu.tr

Recent publications on the Action's topics

- Gokhan Kilic, 2014, Using advanced NDT for historic buildings: Towards an integrated multidisciplinary health assessment strategy, Journal of Cultural Heritage, Available online 11 October 2014, ISSN 1296-2074, http://dx.doi.org/10.1016/j.culher.2014.09.010.
- Gokhan Kilic. 2014. "GPR Raw-Data Order Statistic Filtering and Split-Spectrum Processing to Detect Moisture." Remote Sensing 6(6): 4687-4704, doi:10.3390/rs6064687
- Gokhan Kilic, 2014, Wireless Sensor Network Protocol Comparison for Bridge Health Assessment, ISSN 1225-4568, Structural Engineering and Mechanics, Vol. 49, No. 4 (2014) 509-521 DOI: http://dx.doi.org/10.12989/sem.2014.49.4.000
- Gokhan Kilic, Mehmet S. Unluturk, 2015, Testing of wind turbine towers using wireless sensor network and accelerometer, Renewable Energy, Volume 75, March 2015, Pages 318-325, ISSN 0960-1481, http://dx.doi.org/10.1016/j.renene.2014.10.010.
- Gokhan Kilic. Mehmet Unluturk 2014. "Performance Evaluation of the Neural Networks for Moisture Detection using GPR" Nondestructive Testing and Evaluation, 1058-9759, DOI:10.1080/10589759.2014.941839

Main experience in the Action's topics

- Applications of Ground Penetrating Radar in road structure assessment (layer thickness, homogeneous zones, road defects).
- Development of advanced GPR data processing techniques.
- Applications of GPR and Other NDT in Civil Engineering.

Participation to other COST Actions

No.

Role in COST Action TU1208

WG Associate Member (WG2; WG4).

Turkey

DENIZ KIYMET
Research Assistant
Ankara University – Faculty of Engineering
Department of Geological Engineering
Degol Street, F Block 06100 Tandoğan-Ankara, Turkey
Phone: +90 312 203 33 63 Fax: +90 312 215 04 87
e-mail: kdeniz@eng.ankara.edu.tr

Biographical sketch and Main experience in the Action's topics
Kıymet Deniz graduated Ankara University Department of Geological Engineering in 2010 and got her master degree in 2012. She is a PhD student in Graduate School of Natural and Applied Sciences. She has been a research assistant since 2012. She is also a researcher in Earth Sciences Application and Research Center (YEBIM) of Ankara University. She got involved in GPR studies while working with people in YEBIM. She is the member of EGU and EAG. She was assigned lots of different GPR application such as archeology, geological structures and defining contact relationship between rock units, buried infrastructures

Recent publications on the Action's topics

- Kadıoğlu, S., Kadıoğlu, Y. K., Deniz, K., Akyol, A. A. Ground Penetrating Radar and Micro Raman Spectroscopy in Keciova Mosque Casbah-Algiers (Algeria). 15th International Conference on Ground Penetrating Radar, GPR2014, 30th June-4th July 2014, Brussels, Belgium.
- Kadıoğlu, S., Kadıoğlu, Y. K., Deniz, K., ve Akyol, A. A. 3D Monitoring under the Keciova Mosque (Casbah-Algier, Algeria) with Ground Penetrating Radar Method. European Geosciences Union General Assembly, 27 April-02 May 2014, Geophysical Research Abstracts Vol. 16, EGU2014-9575, 2014.
- Deniz, K., Kadıoğlu, S. ve Kadıoğlu, Y. K., A new Method in the displaying of Deep Contact relationships of an intrusive body with the wall rocks: Ground Penetrating Radar (GPR) Buzlukdagi Syenitoids (Kırsehir-Turkey). European Geosciences Union General Assembly, 22-27 April 2012, Geophysical Research Abstracts Vol. 14, EGU2012-11475, 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Associate Member (WG4).

Turkey

MEHMET SALTAN
Researcher in Civil Engineering
Suleyman Demirel University - Department of Civil Engineering
Bati Campus 32260 Isparta, Turkey
Phone: +90 246 211 12 16 Fax: +90 246 237 08 59
e-mail: mehmetsaltan@sdu.edu.tr

Biographical sketch
Mehmet Saltan received the Doctorate degree in *Transportation* from Suleyman Demirel University, Isparta. He is a Researcher in Transportation and especially Pavement Engineering, and holds the "Highways", "Pavement Analysis and Design" and "Flexible Pavements" courses at Suleyman Demirel University. He is the Head of Transportation Division at the same university. He is the author/co-author of more than 100 works on international books, journals and conference proceedings. His main research interests are in pavement analysis, backcalculation, artificial intelligence, pavement materials. He is a member of the Turkish Society of Civil Engineers and Turkish Road Association.

Main experience in the Action's topics
- Seal Coat Applications and Development of a Performance Model in Highways.
- Investigating Physical Properties of Surface Treatment.
- Applications of Ground Penetrating Radar in pavement engineering.

Recent publications on the Action's topics
- Celaya, M., Ertem, F.S., Nazarian, S., Saltan, M., "Feasibility of detecting debonding of hot mix asphalt layer with nondestructive testing", Inernational Symposium on Nondestructive Testing of Materials and Structures, 15-18 Mayıs 2011, İstanbul, Türkiye.
- Özen, F.S., Celaya, M. Nazarian, S., Saltan, M., Feasibility of Detecting Debonding of Hot Mix Asphalt Layer With Sonic/Seismic & Impulse Methods, 5 E&E Cong., İstanbul, 2012.
- M. Celaya, F. S. Ertem, S. Nazarian, M. Saltan, Feasibility of Detecting Debonding of Hot Mix Asphalt Layer with Nondestructive Testing, Nondestructive Testing of Materials and Structures, RILEM Bookseries Volume 6, 2013, pp 877-881.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Substitute Member. WG Member (WG2: Projects 2.1, 2.5).

Turkey

SERDAL TERZI
Researcher in Transportation
"Suleyman Demirel" University
Department of Civil Eng.
32260 Isparta TURKEY
Phone: +90 246 2111221 Fax: +90 2462370859
e-mail: serdalterzi@sdu.edu.tr

Biographical sketch
Serdal Terzi Mehmet Saltan received the Doctorate degree in *Transportation* from Suleyman Demirel University, Isparta. He is a Researcher in Transportation and especially Pavement Engineering, and holds the "Highways", "Pavement Analysis and Design" and "Flexible Pavements" courses at Suleyman Demirel University. He is the Head of Transportation Division at the same university. He is the author/co-author of more than 100 works on international books, journals and conference proceedings. His main research interests are in pavement analysis, backcalculation, artificial intelligence, pavement materials. He is a member of the American Society of Civil Engineers and Turkish Road Association.

Main experience in the Action's topics
- Estimation of Performance Models in Highways from roughness, LWD, GPR etc data..
- Investigating Physical Properties of Surface Treatment.
- Applications of Ground Penetrating Radar in pavement engineering.

Recent publications on the Action's topics
- Saltan, M., Karaşahin,M. Terzi, S., On the backcalculation of flexible road pavement material properties and new methods, Mechanics Transport Academic Journal, Issue 3, V18-V27, 2009.
- M.Saltan and S.Terzi, "Backcalculation of Pavement Layer Thickness and Moduli Using Adaptive Neuro-fuzzy Inference System", Soft Computing in Pavement & Geomechanical Systems: Recent Advances, SCI 259, pp.177-204, Springer-Verlag Berlin Heidelberg 2009.

Participation to other COST Actions
COST Action TU0702 "Real-time Monitoring Surveillance and Control of Road Networks under Adverse Weather Conditions".

Role in COST Action TU1208
MC Member. WG Member (WG2: Projects 2.1, 2.5).

Turkey

YUSUF KAGAN KADIOGLU
Ankara University
Department of Geophysical Engineering
Ankara, Turkey
e-mail: kadi@ankara.edu.tr

Role in COST Action TU1208
WG Member (WG4: Project 4.1).

CUHMUR OZCAN KILIC
Ankara University
Department of Geophysical Engineering
Ankara, Turkey
e-mail: cokilic@eng.ankara.edu.tr

Role in COST Action TU1208
WG Associate Member (WG2, WG4).

United Kinkdom

AMIR MORTEZA ALANI
Professor BSc (Hons), MSc, PhD, CEng,
FIMechE, FHEA, MCIHT
University of West London
8th floor, Villiers House UK.
Phone: +44 (0) 20 8231 2426
Ealing Broadway, Chatham, W5 2PA London, UK
e-mail: amir.alani@uwl.ac.uk

Main experience in the Action's topics
GPR surveying of roads, tunnels and bridges.

Recent publications on the Action's topics
- A. M. Alani, M. Aboutalebi, G. Kilic, "Applications of Ground Penetrating Radar (GPR) in Bridge Deck Monitoring and Assessment," Journal of Applied Geophysics, 2013, doi: 10.1016/j.jappgeo.2013.04.009.
- A. M. Alani, "Applications of GPR in Structural Detailing of the Medway Tunnel," European Geosciences Union General Assembly 2013 (EGU-GA 2013), Session GI3.1, 7-12 April 2013, Vienna, Austria.
- G. Kilic, A. M. Alani, "Applications of Ground Penetrating Radar in Bridge Health Monitoring Using Different Frequency Antennae Systems," European Geosciences Union General Assembly 2012 (EGU-GA 2012), Vienna, Austria, 22-27 April 2012.

Participation to other COST Actions
No.

Role in COST Action TU1208
MC Member. Leader of Project 3.4. WG Member (WG2: Project 2.1; WG3: Project 3.4). WG Associate Member (WG4). Local Organiser Third General Meeting.

United Kingdom

ADAM COOK
Senior Consultant in Ground Penetrating Radar
TRL Ltd. (Transport Research Laboratory)
Technology Development Group, Infrastructure Division
Crowthorne House, Nine Mile Ride, Wokingham, RG40 3GA, UK
Phone.: +44 1344 770573
e-mail: acook@trl.co.uk

Biographical sketch
Adam Cook received a degree from the University of Wales, Banor in Geological Oceanography. Adam joined TRL in 2008 to expand and develop Ground Penetrating Radar capabilities where he currently holds the position of Senior Consultant. This role involves both research into GPR applications as well as other pavement survey technology and carrying out commercial survey work. Prior to TRL he gained several years experience working with GPR within the civil engineering sector on various projects ranging from large scale trunk road network surveys to small scale detailed assessment of concrete slabs. Adam holds the elected position of Treasurer for the European GPR Association (EuroGPR) and is a fellow of the Geological Society of London. Adam's main research interests are regarding applications of GPR within the built environment, specifically relating to road pavements and their associated infrastructure.

Main experience in the Action's topics
- Road pavement GPR survey and data interogation experience.
- Experienced in GPR in a wide range civil engineering environments and applications.
- GPR system integration to vehicles, espcially for traffic-speed data collection.
- Experienced in other traffic-speed techniques for the assessment of road pavements.

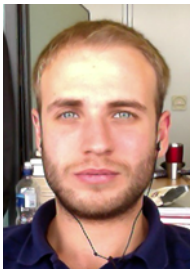
Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG2: Projects 2.1-2.5; WG4: Projects 4.1-4.6).

United Kingdom

IRAKLIS GIANNAKIS
Researcher
Institute of Infrastructure and Environment
The University of Edinburgh, School of Engineering.
AGB Building, The King's Buildings, Edinburgh, EH9 3JL, UK
Phone.: +44(0)131 650 5791
Fax: +44(0)131 650 6781
e-mail: i.giannakis@ed.ac.uk



Biographical sketch
Iraklis Giannakis received a B.Sc. (2009) in Geology and an M.Sc. (2011) in Geophysics from the Aristotle University of Thessaloniki, Greece. He received his PhD from the School of Engineering of The University of Edinburgh, UK. His current research focuses in developing accurate 3D FDTD models of the GPR responses from various landmine targets. The models incorporate a realistic description of soil inhomogeneities, rough surface, vegetation and also include the characteristics of the GPR sensors. Although, the primary aim of his work is to develop the modelling process applied for landmine detection, he is also interested in the development of tools and techniques for the implementation of the geometry and the dielectric properties of materials like concrete, soils and earth materials in general.

Main experience in the Action's topics
- Computational Electromagnetics using Finite Difference Time Domain (FDTD) method.
- Numerical methods for the implementation of complex dispersive media.
- Accurate simulation of GPR antennas.
- Absorbing boundary conditions using FDTD method.
- Applications of GPR for landmine detection, geophysics, archeology and civil engineering.

Recent publications on the Action's topics
- I. Giannakis, A. Giannopoulos, "A Novel Picewise Linear Recursive Convolution Approach for Dispersive Media Using the Finite-Difference Time-Domain Method," IEEE Trans. of Antenn. Propag., 2014.
- I. Giannakis, A. Giannopoulos, A. Davidson, N., "Incorporating dispersive electrical properties in FDTD GPR models using a general Cole-Cole dispersion function," GPR 2012 14th International Conference on , vol., no., pp.232-236, 4-8 June 2012.

Participation to other COST Actions
No

Role in COST Action TU1208
WG Member (WG1: Projects 1.1, 1.2; WG3: Project 3.1).

United Kinkdom

ANTONIS GIANNOPOULOS
Senior Lecturer
The University of Edinburgh - School of Engineering
AGB Building, The King's Buildings, Edinburgh, EH9 3JL,
UK, Phone: +44 131 6505728 Fax: +44 131 6506781
e-mail: a.giannopoulos@ed.ac.uk

Biographical sketch

Antonis Giannopoulos is a Senior Lecturer in the School of Eng., Inst. for Infrastructure and Environment, at The Univ. of Edinburgh, UK. His research interests include the numerical modelling of GPR and the development and application of geophysical techniques for non-destructive testing and condition assessment of structures and transport systems. He also works on the development of efficient absorbing boundary conditions for FD TD wave propagators and on enhancing their ability to model complex and frequency dependent media. He has served in Tech. and Sc. Committees of a number of GPR related conferences and workshops. He is the author of GprMax (www.gprmax.org) a freely available FDTD GPR simulator that is being used by a number of researchers and practitioners to simulate the response of GPRs from a variety of targets. He is a member of SEG and EAGE.

Main experience in the Action's topics

- Numerical modelling techniques for efficient simulation of ground penetrating radar.
- Computational EMs and in particular Finite-Difference Time-Domain methods.
- Absorbing boundary conditions for numerical modelling of EM wave problems.
- Applications of GPR in civil engineering and for infrastructure assessment.
- Accurate numerical simulation of GPR antennas and dispersive media.

Recent publications on the Action's topics

- A. P. Tran, C. Warren, A. Giannopoulos, and S. Lambot, "Numerical evaluation of a full-wave antenna model for near-field applications," NSG, pp. 155–165, Apr. 2013.
- J. van der Kruk, N. Diamanti, A. Giannopoulos, and H. Vereecken, "Journal of Applied Geophysics," Journal of Applied Geophysics, vol. 81, no. C, pp. 88–96, Jun. 2012.
- A. Giannopoulos, "Unsplit Implementation of Higher Order PMLs," Antennas and Propagation, IEEE Transactions on, vol. 60, no. 3, pp. 1479–1485, 2012.

Participation to other COST Actions

No.

Role in COST Action TU1208

MC Member. WG3 Chair. WG Member (WG3: Projects 3.1-3.4). Local Organiser 2015 WG Progress Meeting.

United Kinkdom

FRANK PODD
Senior Experimental Officer
University of Manchester
Department of Engineering
Sackville Street, Manchester, UK
tel.: 0034 161 3064786
e-mail: frank.podd@manchester.ac.uk

Biographical sketch

Frank Podd is the Senior Experimental Officer in the Sensing and Image Signal Processing Group within the School of Electrical and Electronic Engineering at the University of Manchester, UK. An important part of his role is to work on a novel handheld scanner for the detection of anti-personnel landmines. Frank is working on most aspects of the GPR sensor for this project, including FDTD simulations, image reconstruction algorithms, antenna design and measurement, radar electronics and embedded software (including microcontrollers, DSPs and FPGAs). Frank has worked in both academia and industry for a period of 20 years. As well as running his own company, he has worked for a number of small instrumentation producing companies. In general his roles were generally in the creation of electronics or software. In academia, Frank studied at the University of Surrey, UK, and gained a degree in Theoretical Physics, an MSc in Pattern Recognition, and a PhD in Medical X-Ray Image Processing. He has worked as a Researcher in the fields of Industrial Process Tomography and Ultrasound Measurement of Foods in the University of Leeds, and e-Agriculture involving Electrical Impedance and Optical Spectroscopy, at the University of Manchester.

Main experience in the Action's topics
- Numerical simulations using CST Microwave Studio.
- Antenna design and measurement.
- Pulsed and stepped frequency radar electronics.
- Embedded electronics and firmware.

Recent publications on the Action's topics
NA.

Participation to other COST Actions
No.

Role in COST Action TU1208
WG Member (WG1: Project 1.2).

United Kinkdom

CRAIG WARREN
Researcher
The University of Edinburgh - School of Engineering
AGB Building, The King's Buildings,
Edinburgh, EH9 3JL, United Kingdom
e-mail: Craig.Warren@ed.ac.uk

Biographical sketch
Craig Warren received the degrees of B.Eng. in Electrical and Mechanical Engineering, and Ph.D. in Engineering from The University of Edinburgh, U.K. in 2003 and 2009, respectively. From 2010 to 2013 he held the positions of Teaching Fellow and Learning Technologist at The University of Edinburgh, U.K. He is currently a Lecturer (Assistant Professor) in Mechanical Engineering at Edinburgh Napier University, U.K. His main research interests are in the development of numerical modelling methods for Ground-Penetrating Radar, and in improving the interpretation of GPR data. These types of advancements could improve the efficiency and sustainabilty of the life-cyle operation of our buildings, bridges and roads. He is also active in the field of engineering education and technology enhanced learning. He is a Chartered Engineer in the U.K. and a member of both the Institution of Mechanical Engineers, U.K, and the Institution of Engineering Technology, U.K.

Main experience in the Action's topics
- Numerical modelling of GPR antennas using the FDTD method.
- Investigation of optimisation techniques for antenna design.
- Characterisation of the GPR antennas using numerical and experimental methods.
- Application of GPR to the operation and maintenance of critical infrastructure.

Recent publications on the Action's topics
- Tran, A.P., Warren, C., André, F., Giannopoulos, A., & Lambot, S., 2012, "Numerical Evaluation of a Full-wave Antenna Model for Near-field Applications", Journal of Near-Surface Geophysics (http://dx.doi.org/10.3997/1873-0604.2012052)
- Warren, C., & Giannopoulos, A., 2012, "Investigation of the directivity of a commercial Ground-Penetrating Radar antenna using a Finite-Difference Time-Domain antenna model", Proc. 14th Int. Conf. Ground Penetrating Radar.
- Warren, C. & Giannopoulos, A., 2011, "Creating Finite-Difference Time-Domain models of commercial Ground-Penetrating radar antennas using Taguchi's optimization method", Geophysics, 76, 2, G37-G47 (http://dx.doi.org/10.1190/1.3548506).

Participation to other COST Actions
No.

Role in COST Action TU1208
Leader of Project 1.2. WG Member (WG1: Project 1.2; WG3: Projects 3.1-3.4).

MORTEZA ABOUTALEBI
The University of Greenwich, Chatam Maritime, United Kingdom
e-mail: am50@gre.ac.uk

Role in COST Action TU1208
WG Associate Member (WG2, WG4).

TREVOR BENSON
The University of Nottingham, Nottingham, United Kingdom
e-mail: trevor.benson@nottingham.ac.uk

Role in COST Action TU1208
MC Substitute Member. WG Associate Member (WG3).

ALEX BIRTWISLE
Atlas Geophysical Limited, Powys
e-mail: alex@atlasgeo.co.uk

Role in COST Action TU1208
WG Associate Member (WG1, WG4).

SEUMAS CAMPBELL
TU1206 MC Chair
British Geological Survey, Edinburgh, United Kingdom
e-mail: sdgc@bgs.ac.uk

Role in COST Action TU1208
MC Substitute Member. WG Associate Member (WG4).

NIGEL CASSIDY
Keele University, Keele, United Kingdom
e-mail: n.j.cassidy@keele.ac.uk

Role in COST Action TU1208
WG Associate Member (WG1, WG2).

ADAM COOK
TRL Ltd – Infrastructure Division, Wokingham, United Kingdom
e-mail: acook@trl.co.uk

Role in COST Action TU1208
WG Member (WG2: Projects 2.1-2.5; WG4: Projects 4.1-4.6).

MICHAEL GORDON
Infrastructure Services - Mouchel
Glasgow, United Kingdom
e-mail: michael.gordon@mouchel.com

Role in COST Action TU1208
WG Associate Member (WG4).

LEI LI
Queen Mary University of London,
London, United Kingdom
e-mail: sdgc@bgs.ac.uk

Role in COST Action TU1208
WG Associate Member (WG3, WG4).

United Kinkdom 

CHRISTOPHER STEFAS
GM Radar Solutions, London, United Kingdom
e-mail: sales@gmradar.com

Role in COST Action TU1208
WG Associate Member (WG1, WG3).

USA

WAHEED UDDIN

Professor of Civil Engineering
University of Mississippi
Center for Advanced Infrastructure Technology
Dept of Civil Engineering, 106 Carrier
P.O.Box: 1848, Univ., MS 38677-1848 USA
Phone: +1 662 915 5363, Fax: +1 662 915 5523
e-mail:cvuddin@olemiss.edu cvuddin@gmail.com

Biographical sketch

Dr. Waheed Uddin earned PhD in Transportation Engineering in 1984 from the University of Texas at Austin, Master in Geotechnical Engineering from Asian Institute of Technology, Bangkok in 1975, and Bachelor in Civil Engineering from the University of Karachi in 1970. Previously a pavement expert for the United Nations, he is the Founder Director of the Center for Advanced Infrastructure Technology (CAIT). Dr. Uddin has over 35 years of professional and research experience in highways, airports, infrastructure, nondestructive evaluation, air quality, traffic management, and environmental sustainability. He is currently conducting intermodal integration and infrastructure disaster protection research to assess disaster risk vulnerability and enhance global supply chain. These projects are funded by the recently established USDOT's National Center for Intermodal Transportation for Economic Competitiveness (NCITEC). Dr. Uddin's 240 publications include four books on infrastructure management, one book chapter in 2012 Springer Climate Change Mitigation Handbook, and one book chapter in 2006 CRC Highway Engineering Handbook. He has been serving as Chief Editor of International Journal of Pavements (IJP) since its founding in 2002. http://www.ijpavement.com/

Main experience in the Action's topics

- Nondestructive evaluation and asset management of highway and airport pavements
- Laser and satellite imagery remote sensing technologies and spatial visualization for infrastructure and environmental applications

Recent publications on the Action's topics

- W. Uddin, W.R. Hudson, R. Haas, "Public Infrastructure Asset Management," McGraw-Hill Education, Inc., New York, 2013. ISBN 0071820116 ISBN-13: 978-0071820110
- W. Uddin, "An Overview of GPR Applications for Evaluation of Pavement Thickness and Cracking," Paper 142, GPR 2014, 15th International Conference on Ground Penetrating Radar, Brussels, Belgium, June 30 – July ,4 2014
- W. Uddin, "A Synthesis Study of Noncontact Nondestructive Evaluation of Top-down Cracking in Asphalt Pavements," Final Report FHWA/MS-DOT-RD-13-255, Mississippi Department of Transportation Research Study SS 255, Center for Advanced Infrastructure Technology Report UM-CAIT/2013-01, The University of Mississippi, December 2013

Role in COST Action TU1208

MC Observer from IPC. WG Associate Member (WG1-WG4).

MESBAH AHMED
University of New Mexico, Albuquerque, New Mexico, USA
e-mail: mahmed@unm.edu

Role in COST Action TU1208
MC Observer from IPC. WG Associate Member (WG1-WG4).

PAUL GOGGANS
University of Mississippi, Oxford, MS, USA
e-mail: goggans@olemiss.edu

Role in COST Action TU1208
USA Observer from IPC. WG Associate Member (WG1-WG4).

DAVID R. LUHR
Washington State Department of Transportation, Olympia, Washington, USA
e-mail: luhrd@wsdot.wa.gov

Role in COST Action TU1208
USA Observer from IPC. WG Associate Member (WG1-WG4).

A. T. PAPAGIANNAKIS
University of Texas, Austin, Texas, USA
e-mail: AT.Papagiannakis@utsa.edu

Role in COST Action TU1208
USA Observer from IPC. WG Associate Member (WG1-WG4).

RAFIQUL A. TAREFDER
University of New Mexico, Albuquerque, New Mexico, USA
e-mail: tarefder@unm.edu

Role in COST Action TU1208
MC Observer from IPC. WG Associate Member (WG1-WG4).

DEVENDRA PARMAR
Hampton University, Hampton, VA, USA
e-mail: devendra.parmar@hamptonu.edu

Role in COST Action TU1208
USA Observer from IPC. WG Associate Member (WG1-WG4).

JOHN P. ZANIEWSKI
Washington State Department of Transportation, Olympia, Washington, USA
e-mail: John.Zaniewski@mail.wvu.edu

Role in COST Action TU1208
USA Observer from IPC. WG Associate Member (WG1-WG4).

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COST ACTION TU1208
INSTITUTIONS

ALBANIA

Polytechnic University of Tirana

Institute of Geosciences, Energy, Water & Environment, Dept. of Regional and Eng. Geophysics

Str. Don Bosko, nr.60, 1024 Tirana, Albania

Hamza Reçi (MC Observer)

Research activities within the COST Action TU1208:

- Applications of GPR in geological-engineering studies, mainly to road basements and landslides.
- Application of GPR for the detection of buried archaeological features.
- Application of resistivity and electromagnetic methods for near-surface studies.

Available GPR equipment:

- IDS RIS 99. Ground-coupled antennae 250 MHz in contract with ALTEA & Geostudio geological-engineering company.
- Electromagnetic Instrument OKM exp5000, with two horizontal antennas, for engineering studies.

Other available equipment, useful for the Action's activities:

- Multielectrode resistivity system with two multicore cables 30 take-outs each.
- Engineering seismograph with 24 channels used for engineering studies.

Software useful for the Action's activities:

- Commercial software for 2D radar signal processing, 2D resistivity data processing, 2D seismic data processing.
- Commercial software for 3D EM modelling:

ARMENIA

State Engineering University of Armenia

Faculty of Radio Engineering & Communication Systems,
Fiber Optics Communication Laboratory (FOC Lab)

105 Terian str., Yerevan, Armenia

Hovik Baghdasaryan (MC Observer)

Research activities within the COST Action TU1208:

- Theoretical investigation and computer simulation of electromagnetic wave interaction with wavelength-scale inhomogeneous and non-linear (intensity dependent) multilayer structures. For analysis the non-traditional method for solution of boundary problems of electrodynamics, namely method of single expression (MSE) is used. This method has been developed in FOC Lab and successfully applied for the analysis of different boundary problems.
- Application of the MSE for solution of boundary problems relevant to ground-penetrating radar's problems is on the way.

Available GPR equipment:

NA.

Other available equipment, useful for the Action's activities:

NA.

Software useful for the Action's activities:

Home–made programs on the basis of the MSE for analysis of electromagnetic wave interaction with different types of multilayer structures.

AUSTRALIA

Transport and Main Roads (TMR)
Engineering & Technology Division

35 Butterfield Street, Herston,
Queensland, Australia

Queensland Government
Department of Transport and Main Roads

Wayne Muller (MC Observer)

Research activities within the COST Action TU1208:

- Investigating use of multi-offset 3D Noise-Modulated GPR (NM-GPR) for calibrated pavement layer depth estimates and in-situ moisture quantification.
- Laboratory permittivity characterisation methods for civil engineering materials.
- Use of GPR in combination with the Traffic Speed Deflectometer (TSD) for rapid pavement investigations.

Available GPR equipment:

- GSSI SIR-3000 with 1.5GHz and 1.0GHz ground coupled antennas.
- Access to the RPS 2nd gen. 3D Noise-Modulated GPR (NM-GPR) equipment.

Other available equipment useful for the Action's activities:

- Fieldfox VNA (Model N9923A, 4GHz) with dipole antennas.

Software, useful for the Action's activities:

- Reflexw
- Portal 4D (NM-GPR)

AUSTRIA

Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology

Hohe Warte 38, 1190 Vienna, Austria

Immo Trinks (MC Member)
Wolfgang Neubauer (MC S Member)
Alois Hinterleitner

Research activities within the COST Action TU1208:

- Application of GPR to large-scale high-resolution archaeological prospection.
- Development of motorised GPR systems.
- Development of data efficient positioning and navigation solutions.
- Large-scale GPR prospection case studies in the UK, Norway, Sweden, Germany and Austria.
- Development and application of data processing solutions.
- Development and application of data interpretation solutions.

Available GPR equipment:

- Motorised 16 channel 400 MHz MALÅ Imaging Radar Array (8 cm crossline spacing; RTK-GPS / Totalstation positioning).
- Motorised 6 channel 500 MHz Sensors & Software Pulse Ekko Pro SPIDAR system.
- Several sledge and cart mounted Sensors & Software Noggin Plus and Pulse Ekko Pro 100, 250, 450, 500, 900, 1000 MHz antennae, and GSSI 200, 500 MHz antennae.

Other available equipment, useful for the Action's activities:

- RTK-GPS and robotic total stations.
- Complementary large-scale high-resolution magnetic prospection measurements (Fluxgate and Cesium magnetometry).

Software, useful for the Action's activities:

- ReflexW for GPR data processing and visualisation.
- In-house ApRadar2.0 for GPR data processing and visualisation.
- ArcGIS 10.1.

Further TU1208 Partners in Austria:

Zentralanstalt für Meteorologie und Geodynamik

Vienna, Austria

Sirri Seren

Belgian Road Research Centre (BRRC)

Boulevard de la Woluwe, 42
1200 Brussels, Belgium

Colette Grégoire
Carl Van Geem

Research activities within the COST Action TU1208:

- Helping private companies and public authorities to find solutions for design, construction and maintenance of efficient high-quality road infrastructure under optimal economic conditions, as well as to solve safety, mobility and environment problems raised by modern road transport.
- Using GPR for the investigation of the road structure: estimation of layer thickness (improvement of back calculation), visualisation of homogeneous zones, detection of road damages, cavities/holes detection.
- Measuring road deflection (estimation of layers moduli by back calculation), in order to evaluate lifetime expectance of road structure.
- Developing methodologies for the use of GPR equipment and data in the frame of road sector activities.

Available GPR equipment:

GSSI, SIR 20, horn antennas, with 1 GHz and 2 GHz centre frequencies.

Other available equipment, useful for the Action's activities:

- Falling Weight Deflectometer (FWD).
- Curviameter.
- Ultrasonic tomograph (defects in concrete) - MIRA Tomographer, GERMANN INSTRUMENTS A/S.

Software, useful for the Action's activities:

RADAN 6.6.

Ghent University
Department of Soil Management
Research Group Soil Spatial InventoryTechniques

Coupure 653, 9000 Gent, Belgium

Marc Van Meirvenne (MC Member)
Samuel Delefortrie
Jan De Pue
Philippe De Smedt
Ellen Van De Vijver

Research activities within the COST Action TU1208:

- Application of GPR to soil-related phenomena: general soil characterisation, soil moisture, detection of compaction, pollution, buried objects.
- Applications of GPR in agriculture, archaeology, environmental pollution and civil engineering.
- Integration of GPR and multi-receiver electromagnetic induction measurements.

Available GPR equipment:

- 3d-radar: Geoscope (stepped frequency between 100 – 3000 MHz), with 1 m long array of antennas (7.5 cm spacing between antennas).

Other available equipment, useful for the Action's activities:

- Multi-receiver electromagnetic induction sensors: Dualem 1S, 21S and 421S.
- Motorised configuration with GPS with differential correction (Nokia, Trimble).

Software, useful for the Action's activities:

- In-house software for data processing of EMI measurements.
- 3D-examiner.
- ArcGIS.

BELGIUM

Université Catholique de Louvain

Earth and Life Institute, Environmental Sciences
Croix du Sud 2, box L7.05.02

Institute of Information and Communication Technologies, Electronics and Applied Mathematics
Place du Levant 2, box L5.04.04

1348 Louvain-la-Neuve, Belgium

Sébastien Lambot (MC Member)
Christophe Craeye (MC S Member)
Albéric De Coster
Jana Jezova
Laurence Mertens
Nicolas Mourmeaux
Gabriela A. Rodriguez
Denis Tihon

Research activities within the COST Action TU1208:

- Application of GPR to agricultural and environmental engineering: soil moisture mapping, soil moisture monitoring, soil stratigraphy imaging. Application of GPR to civil engineering: leak detection in water supply networks, road inspection.
- Development of far- and near-field full-wave methods for the solution of electromagnetic forward-scattering problems including antennas and 3D layered structures.
- Full-wave inversion techniques for the retrieval of soil electromagnetic properties.
- Development of advanced GPR data processing techniques to filter out antenna effects.
- Experimental characterisation of antennas. Antenna array design and modelling.

Available GPR equipment:

- GSSI SIR-20 with antennas ranging from 12.5 MHz to 900 MHz.
- Vector network analysers (2-4 ports) with antennas ranging from 200 MHz to 8.5 GHz.

Other available equipment, useful for the Action's activities:

- Time and frequency domain reflectometry.
- Automated imaging scanner with a 3 x 3 x 1 m laboratory model (e.g., sand box).
- Anechoic chamber. A 3 x 3 m copper plane for antenna calibration.

Software, useful for the Action's activities:

- In-house software implementing the developed intrinsic antenna models for the electromagnetic simulation and inversion.
- Fast Green's functions codes for wave propagation in planar layered media.
- Method of moment codes for antenna design.

Commercial EM simulation software.

BELGIUM

Further TU1208 Partners in Belgium:

University of Liège

Liège, Belgium

Frédéric Nguyen

Vrije University

Brussels, Belgium

Hichem Sahli

FESB University of Split

R. Boskovica 32, HR-21000 Split, Croatia

Dragan Poljak (MC S Member)
Silvester Šesnić

Research activities within the COST Action TU1208:

- Application of numerical methods to electromagnetic compatibility problems pertaining to wire antennas, transmission lines, lightning rods, grounding systems.
- Development of space-frequency and space-time integral equation formulations for complex thin wire structures, based on Pocklington- and Hallen-type equations.
- Assessment of human exposure to electromagnetic fields using 3D models based on finite element method (FEM), boundary element method (BEM), and hybrid methods.
- Analysis of radiated and conducted emissions and immunity, interference reduction.
- Design, improvement and calculation of EMF probes and sensors.
- Experimental characterisation of antennas and antenna systems.

Available GPR equipment:

- Broadband antennas.
- Spectrum analysers.

Other available equipment, useful for the Action's activities:

- GTEM cell.
- Signal generators, RF amplifiers, power sensors.
- ELF and RF filed probes.

Software, useful for the Action's activities:

- ReflexW software for the processing and visualisation of GPR data.
- Ground Vision and gpr.exe software for acquisition, basic processing and visualisation.
- ANSYS Multiphysics for electromagnetic modelling.

University of Zagreb
Faculty of Civil Engineering

Kaciceva 26, 10000 Zagreb, Croatia

Mario Bacic (MC Member)
Danijela Marcic (MC Member)
Lovorka Libric (MC S Member)
Tatjana Rukavina
Josipa Domitrovic

Research activities within the COST Action TU1208:

- Application of GPR in soil and rock surveying: geological investigations to determine layer boundaries, faults and other anomalies related to soil and rock (especially in karst terrain, including discontinuities and caverns).
- Investigation of embankments in hydrotechnical/geotechnical applications, as well as railroad embakments and ballasts for geotechnical/road applications.
- Application of GPR to pavement monitoring: diagnosis of road damages, planning of pavement management, automatic detection and thickness measurement of pavement layers, moisture content and density measurement in road subgrade, analysis of asphalt properties in flexible pavements, diagnosis of plastic material infiltration in road subgrade.

Available GPR equipment:

- Ground-coupled antennas with 100, 400 and 500 MHz centre frequencies.
- Air-coupled antennas with 1.0 and 2.2 GHz centre frequencies.

Other available equipment, useful for the Action's activities:

- Spectral and multichannel analysis of surface waves (SASW and MASW).
- Continous generation of surface waves (CSWS).
- Seismic refraction and reflection.
- Vibration measurements equipment .

Software, useful for the Action's activities:

- GPRSoft Pro software, developed by Geoscanners AB.
- GPRSIM, GPR simulation software.
- RoadDoctor Pro software, developed by Roadscanners.
- RADAN software, developed by GSSI.
- ELMOD 6, software, developed by Dynatest .

CROATIA

Further TU1208 Partners in Croatia:

University of Osijek,

Osijek, Croatia

Ivica Guljas
Damir Varevac

CZECH REPUBLIC

CDV - Centrum Dopravniho Vyzkumu, v.v.i. (Transport Research Centre)

Lisenska 33a, 63600 Brno, Czech Republic

Josef Stryk (MC Member)
Radek Matula (MC S Member)

Research activities within the COST Action TU1208:

- The CDV, founded by the Ministry of Transport of the Czech Republic, develops national and international R&D projects and cooperates with road and motorway directorate, as well as with other institutions and companies, on finding practical solutions applicable to the road network. Involvement in CEN TC 227 Road Pavements and in COST Actions focuses on road infrastructure topics. Member of FEHRL.
- Application of GPR to road and bridge pavements (thickness measurement, position of inbuilt rebar, moisture content and density measurement in road subgrade), and decks.
- Comparative tests of different NDT devices.
- Pavement diagnostics with FWD (deflection, load transfer efficiency on slabs of rigid pavements, calculation of pavement remaining life) and with a laser scan device.
- Road visual inspections. Design of road maintenance (special focus on rigid pavements).

Available GPR equipment:

- GSSI SIR-20 (2 channel system), with GSSI air-launched antennae (1000 and 2000 MHz centre frequencies), and GSSI ground-coupled antennae (400, 1600 and 2600 MHz).

Other available equipment useful for the Action's activities:

- Measuring car, with a device to measure a driven distance (high speed measurements).
- Falling Weight Deflectometer (FWD), by RODOS company (Czech Republic).
- Mobile dynamic cycling loading device, for on-site testing of pavement properties.
- Drilling rig for taking cores on-site (trailer and hand-held device).
- Technical camera Contour, with inbuilt global positioning system GPS.
- PROCEQ Tico Ultrasonic Instrument, for non-destructive testing.
- Laboratory for testing of concrete (strength, resistance against freezing/thawing, resistance against defrosting agents) and soil properties (bearing capacity, moisture content).
- Laboratory geotechnical testing field (3 x 10 x 1.4 m pit with a loading device).

Software, useful for the Action's activities:

- GSSI, RADAN 7, Modules - 3D, BridgeScan, RoadScan, StructureScan.
- Sandmeier, Reflexw 7, Modules - 2D-data analysis, 3D-data interpretation, Modelling.
- DG_LAYMED_FWD and LayEPS - Czech software for evaluation of FWD data.

CZECH REPUBLIC 

Further TU1208 Partners in Czech Republic:

Arcadis Geotechnika

Prague, Czech Republic

Jiri Nedved

Brno University of Technology

Brno, Czech Republic

Michal Varaus

Czech Technical University in Prague

Prague, Czech Republic

Ludvik Vebr

GF Instruments

Brno, Czech Republic

Vit Gregor

Inset

Prague, Czech Republic

Roman Smolik

DENMARK

Ramboll Denmark Department of Geophysics and Geohydrology

Hannemanns Allé 53, DK-2300 Copenhagen
Denmark

Roger Wisén (MC Member)
Jørgen Ringgaard (MC S Member)

Research activities within the COST Action TU1208:

- Application of Ground Penetrating Radar and other NDT technologies for assessment and monitoring of civil engineering structures, including pavement on roads, bridges and airports, tunnels, railways.
- Efficient acquisition and handling of large datasets.
- Application of GPR on geological scale for groundwater and infrastructure projects.
- Application of GPR in archaeological prospecting and cultural heritage diagnostics.

Available GPR equipment:

- 3D RADAR GeoScope MKIV system with DX1821 and DX1213 antennas.
- Malå GeoScience ProEx system with 100 MHZ RTA antenna.
- GSSI SIR-3000 system with full suit of antennas from 20MHz to 2 GHz .

Other available equipment useful for the Action's activities:

- Vehicles equipped with laser scanning and HD surface photography systems.
- Trimble SPS-852 GNSS-system and OXTS-INS system.
- ABEM Terrameter LS system for resistivity imaging, SP and IP surveys.
- DUALEM-421 system for conductivity soundings.
- Various other NDT equipment: Ultrasonic, impact echo etc.
- Full suite of sondes for borehole wireline-logging
- Seismic equipment: seismographs, geofones, minivib etc.

Software, useful for the Action's activities:

- 3D RADAR Examiner
- GSSI RADAN 7.0
- REFLEXW

EGYPT

National Research Institute of Astronomy and Geophysics (NRIAG)

1 Mirsad Street, Beside Behman Hospital
11722 Helwan, Cairo, Egypt

Magdy Ahmed Atya (MC Observer)

Research activities within the COST Action TU1208:

- Implementing the GPR to prospect the archaeological regime on different scales starting from the minor contents to the outer boarder of an archaeological site.
- Utilizing the GPR for inspecting the case of the monument's inner fractures and deformations, the situation of the former restoration processes, and evaluating the transition zones caused on the monument's bodies by the salinity, disposals, and nests.
- Using the GPR for the geotechnical assessments, such as; site evaluation, cavity detection, land subsidence, road construction, safe paths in the desert, concrete and Steele deformations, bridge checkups and testing the column's bubbles in combination with thermal cameras.
- Using the GPR to observe the contamination and disposal trenches.

Available GPR equipment:

- GSSI SIR 2000 (one set).
- GSSI SIR 20 (three sets).
- Antennas (MLF 16-80 MHZ, 100 MHZ, 200 MHZ, 400 MHZ, 900 MHZ, 1.5 GHZ, and 2.6 GHZ).

Other available equipment useful for the Action's activities:

- ER (Gga30, Gga31, Syscal R2 / 96 electrodes, ResMaster, RM16).
- EM Profiler GEM300.
- Seismic StratView.

Software, useful for the Action's activities:

- RADAN 6.6 / Reflex.
- Electre / ResInv2D-3D/ Resist/ IP.
- Microsoft Montage, Golden Software.

ESTONIA

Institute of Ecology Tallinn University
Department: Landscape Ecology

Uus-Sadama 5, Tallinn 10120, Estonia

Hannes Tõnisson (MC Member)
Kadi Vilumaa (MC Member)

Research activities within the COST Action TU1208:

- Applications of GPR in ecology (ground water table, characterization of peat layers etc.), archaeology (buried buildings, other objects etc.), geology (thickness of various sediment layers, internal structure of coastal formations) and civil engineering.
- GPR mapping of underground utilities and voids.
- Integrated geophysical studies.

Available GPR equipment:

- GSSI SIR-20 and GSSI SIR-3000 with the following antennas 100 MHz, 270 MHz, 300 MHz and 500 MHz.

Other available equipment useful for the Action's activities:

- RTK-GPS (Leica).
- Drilling system (engine powered, allows to reach up to 9 m depth in sandy sediments)
- Other geophysical and geo-acoustic equipment for lakes and seas (Chirp, boomer, side-scan sonar).

Software, useful for the Action's activities:

- RoadDoctor Pro software, developed by Roadscanners.
- ArcGIS (latest version).
- Mapinfo Professional.

FINLAND

AALTO University
Department of Civil and Environmental Engineering

Department of Electrical Engineering
P.O.Box 12100, FI-00076 Espoo, Finland

Terhi Pellinen (MC Member)

Research activities within the COST Action TU1208:

- Antenna measurements.
- Design of radar hardware for various purposes.
- Measurements of the radar cross-section of selected targets.
- Development of asphalt pavement measurement applications.

Available GPR equipment:

No available GPR equipment.

Other available equipment useful for the Action's activities:

- RF to millimeter wave vector network analyser.
- Electromagnetic xyz-scanner with computer control and antenna set.
- Comprehensive RF and millimeter wave laboratory instrumentation, up to 90 GHz.

Software, useful for the Action's activities:

- 3D electromagnetic simulation software: IE3D.

FINLAND

Geological Survey of Finland

Betonimiehenkuja 4, FI-02150 Espoo, Finland

Pekka Hänninen (MC Member)
Taija Huotari-Halkosaari(MC S Member)

Research activities within the COST Action TU1208:

- Soil monitoring by using GPR : changes in water content and frost
- Condition of tree trunks and roots
- Snow cover and water content measurements by stationary radar
- Bearing capacity using RSAD (Radar Surface Arrival Detection) method
- Concrete reinforcement studies

Available GPR equipment:

- 2*GSSI SIR-3000, GSSI SIR-20, MALÅ GEOSCIENCE 3*Ramac
- Antennas GSSI : 100 – 1500 MHz ; Geoscience : 25 – 100 MHz

Other available equipment, useful for the Action's activities:

- VRS-GPS
- ADEK Percometer
- Several EM –equipments, like EM31, EM34 and EM-38
- Campbell SCI soil and moisture, temperature and conductivity stations
- ABEM soil resistivity logging

Software, useful for the Action's activities:

- Geodoctor
- Radan
- ArcGIS

FYR OF MACEDONIA

Ss Cyril and Methodius University-Skopje Faculty of Electrical Engineering and Information Technologies

Rugjer Boskovik bb, 1000 Skopje, Republic of Macedonia

Borislav Popovski (MC Member)
Pero Latkoski (MC S Member)

Research activities within the COST Action TU1208:

- Radio Communications.
- Antenna theory. Applied antennas in different wireless communication technology. Practical implementation of antennas.
- Antenna modeling and simulation.
- Spectrum measurements.

Available GPR equipment:

NA.

Other available equipment useful for the Action's activities:

NA.

Software, useful for the Action's activities:

- Antenna modeling and development software: Antenna magus.
- 3D electromagnetic simulation software: CADFEKO.

FRANCE

Alyotech Technologies Alyotech TS&I

2 rue Antoine Becquerel, 35700 Rennes, France

Nicolas Pinel

Research activities within the COST Action TU1208:

- Development of rigorous and asymptotic methods for the solution of electromagnetic forward-scattering problems by two-dimensional and three-dimensional layered media.
- Development of numerical techniques for the estimation of pavement thickness from GPR data.

Available GPR equipment:

NA.

Other available equipment, useful for the Action's activities:

NA.

Software, useful for the Action's activities:

- In house software for radar simulation and signal processing, called SEAMOTION.
- In-house software implementing the Method of Moments (PILE method) and asymptotic models (Kirchhoff approximation, Small Perturbation Method) for the electromagnetic simulation of complex 2D GPR scenarios (multi-layer problems, buried objects).
- 3D electromagnetic simulation software: FEKO, PUMA-EM.

AMU/CNRS/ECM – Institut Fresnel
Campus Universitaire de Saint-Jérôme
Avenue Normandie-Niemen, 13397
Marseille Cedex, France

Christelle Eyraud
Amélie Litman
Hervé Tortel

Research activities within the COST Action TU1208:

- Development of numerical methods for the solution of electromagnetic forward and inverse scattering problems by buried structures.
- Qualitative, shape-reconstruction and quantitative estimation of electromagnetic and physical properties from electromagnetic scattered fields.
- Synthesis, analysis and experimental characterization of antennas.
- Measurements of the radar cross-section or scattering patterns of selected targets.
- Experimental studies using prototypes of imaging systems based on multistatic antennas arrangement.
- Development of advanced calibration procedures and data processing techniques.
- Characterization of the electromagnetic properties (permittivity, permeability) of solid and granular materials.

Available GPR equipment:

No available GPR equipment.

Other available equipment useful for the Action's activities:

Anechoic chambers, vectorial network analyzers, RF cables and connectors, ridged-horn antennas, electromagnetic xyz-scanners (planar and spherical geometrical arrangement) with computer control and antennas sets, circular microwave imaging scanner with multiplexed antennas, coaxial cells for dielectric properties measurements, sand boxes.

Softare, useful for the Action's activities:

- In-house 2D and 3D electromagnetic simulation software based on the Method of Moments and the Finite Element method.
- In-house electromagnetic 2D and 3D imaging software based on qualitative and quantitative inversion algorithms.

FRANCE

Centre For Studies And Expertise On Risks, Environment, Mobility, And Urban And Country Planning

Cité des mobilités – 25, Avenue François Mitterrand
CS 92 803 - F-69674 Bron Cedex

Cyrille Fauchard Amine Ihamouten Cédric Le Bastard

Research activities within the COST Action TU1208:

- Implementation of in situ and in-lab Step Frequency Radar measurements for the assessment of HMA compaction/density. Non-destructive measurements of very thin asphalt layers and detection and characterization of debonded interfaces. Dielectric characterisation of civil engineering materials in the GPR frequency band. Definition of testing and calibration procedures for GPR and Step Frequency Radar systems.
- Electromagnetic full-wave inversion for the physical and the hydrical mapping of old buildings: Step Frequency Radar vs. Tufeau walls.
- Electromagnetic waveguide propagation for the study of concrete structure durability: water, chloride and carbonation ingresses.
- Simulation of wave propagation in road layers with rough surface and interfaces.

Available GPR equipment:

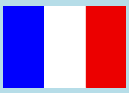
GSSI (Sir 3000 and Sir 30) with 200, 400, 900 MHz, 1.5 and 2.6 GHz ground coupled antennae and 1 and 2 GHz air-coupled antennae. Step Frequency radar with two pairs of ETSA antennae (frequency band [1.4-20] GHz and [0.4-6] GHz respectively).

Other available equipment useful for the Action's activities:

Dielectric characterization scanning systems for slabs samples (mono and multi-offset configurations). Cylindrical cavities and a cylindrical transmission line for dielectric characterization of various materials (rocks, unconsolidated materials, HMA…) in the GPR frequency band. Infrared camera, Slingram EM34 and EM31 systems for low-frequency geophysical measurements, TerraMeter LS system for electrical measurements. Test sites for road, dike, railway, bridge, tunnel and old building studies

Software, useful for the Action's activities:

- In-house software (NWARadar and Dycacyl) for Step Frequency Radar and dielectric characterization systems.
- Empire FDTD, ReflexW software and Comsol FE software for complex GPR, low-frequency and DC-electrical simulations of complex systems.
- MicMac software for DEM reconstruction of topographic scene in radar measurements.



École Supérieure d'Électricité (SUPELEC)
Centre National de la Recherche Scientifique (CNRS)
Laboratoire des Signaux et Systèmes (L2S)

SUPELEC, 3 rue Joliot-Curie 91192 Gif-sur-Yvette, Cedex, France

Mohammed Serhir (MC S Member)
Dominique Lesselier
Marc Lambert

Research activities within the COST Action TU1208:

- Application of GPR to road pavement: diagnosis of road damages, automatic detection and thickness measurement of pavements' layers, measurement in road subgrade.
- Antenna design for GPR application. UWB antennas modeling and characterization (pulsed antennas measurement).
- Near-field to far field transformation in the frequency and the time domains.
- Development of advanced GPR data processing techniques. Development of numerical techniques for the localization of buried structures using time-reversal technique.

Available GPR equipment:

- Planar near-field measurement facility 0.5-18 GHz for GPR antenna footprint evaluation (time and frequency domains)
- TEM horn antennas 300-6300 MHz, Horn antenna 500-9500 MHz (2), Biconique antenna 200-2500 MHz (2), (Vivaldi , bowtie antennas) 500-3000 MHz (2), other UWB antennas. We also design our own antennas for GPR applications.
- Spherical near-field facility 0.2GHz-18GHz for antenna radiation pattern measurement.

Other available equipment useful for the Action's activities:

- Vector network analyzer covering the frequency band [40MHz, 40GHz].
- Spectrum analyzer up to 20 GHz.
- Sampling oscilloscope, with 20 GHz bandwidth.
- Picosecond pulse generator (45ps rise time). Arbitrary waveform generator up to 6GHz.
- Power amplifiers, signal analyzers.

Software, useful for the Action's activities:

- 3D electromagnetic simulation software: CST Microwave Studio (Finite integration technique) and FEKO (method of moment).

FRANCE

EOST, Strasbourg University

5 Rue René Descartes, 6084 Strasbourg, France

Maksim Bano

Research activities within the COST Action TU1208:

- Development of new methods for the solution of forward electromagnetic scattering problems by buried structures.
- Development of other advanced electric and electromagnetic methods for the inspection of construction materials and structures.
- GPR inspection of construction materials and structures.
- GPR mapping of underground utilities and voids, with a focus to urban areas.
- Determination, by using GPR, of the volumetric water content in structures, sub-structures, foundations and soil.
- Development of advanced GPR data processing and imaging techniques.
- Applications of GPR in archaeological prospecting and cultural heritage diagnostics.

Available GPR equipment:

- Ramac, 100, 250 MHz, 500, 800 and 1200 MHz centre frequencies, shielded antenna.
- Ramac, 50 MHz centre frequencies, RTA antenna.

Other available equipment useful for the Action's activities:

- ARES (GF Instruments) and LUND (ABEM) systems for resistivity imaging, SP and IP surveys (in cooperation with University of Silesia and Cracow University of Technology) - for complex electrical and electromagnetic measurements.
- Conductivity meters EM-31, EM-34, EM-38 (Geonics Ltd.) for electromagnetic profiling (in cooperation with University of Silesia) – for wide-range of electromagnetic surveys.
- Gravity meter CG-5 Autograv (Scintrex Ltd.) – for complex GPR and microgravimetric measurements.

Software, useful for the Action's activities:

- In-house GPR data processing software.
- In-house 2D and 3D modelling software implementing the FDTD technique.

FRANCE

Institut Français des Sciences et Technologies des Transports, de L'Aménagement et des Réseaux

14-20 Bd Newton, Cité Descartes,
Champs sur Marne 77447
Marne-la-Vallée 2, France

Xavier Dérobert (MC Member)
Jean Dumoulin

Vincent Baltazard
Geraldine Villain
Xiaoting Xiao

Research activities within the COST Action TU1208:

- Application of GPR to road pavement: diagnosis of road damages, pavement monitoring and planning of pavement management, automatic detection and thickness measurement of pavements' layers, moisture content and density measurement in road subgrade, analysis of asphalt properties in flexible pavements, diagnosis of plastic material infiltration in road subgrade.
- Development of advanced GPR data processing techniques.
- Synthesis, analysis and experimental characterisation of antennas.
- Development of NDT techniques complementary to GPR (Ex: Impact Echo, Ultrasound, Active Infrared Thermography).

Available GPR equipment:

- GPR SIR3000 (GSSI) – Antennas: 500 MHz (2), 900 MHz (2), 1500 MHz (2), 2600 MHz (2).
- StructureScan (2.6 GHz).
- Network analyser (PNA E8362) – Antennas [800 MHz - 8 GHz] and [2 GHz – 20 GHz] twins.

Other available equipment useful for the Action's activities:

- Infrared cameras and dedicated in-house acquisition systems.
- A geophysical test site (20 x 30m).
- Instrumented reinforced concrete beams.
- Climatic chamber.

Software, useful for the Action's activities:

- In-house software for GPR data analysis.
- In-house software for infrared image analysis.
- FEM software for numerical simulations.

FRANCE

Institut de Mecanique et d'Ingénierie de Bordeaux I2M, Département Génie Civil et Environnemental Université de Bordeaux

351 cours de la libération, 33405
Talence, France

Zoubir Mehdi Sbartaï

Research activities within the COST Action TU1208:

- Application of GPR to reinforced concrete evaluation.
- Moisture detection and evaluation, chlorides detection and evaluation.
- Application of GPR to moisture evaluation of wood material.
- Development of analytical and numerical modelling of GPR wave.
- Analysis and experimental characterisation of antennas.
- Development of patch antennas.
- Permittivity measurement of concrete and wood materials.

Available GPR equipment:

- GPR SIR3000 (GSSI) – Antennas: 100 MHz, 400 MHz, 1.5 GHz, 2.6 GHz.
- Network analyser [1 MHz - 8 GHz].

Other available equipment useful for the Action's activities:

- Electrical resistivity measurement (4 points and tomography).
- Infrared cameras.
- Acoustic emission technique.
- Ultrasonic measurement (50 KHz and 200 KHz).
- A reinforced concrete slab site test (2.4 x 12 m).
- Climatic chamber (humidity, temperature and chlorides control), 0.8 m^3.

Software, useful for the Action's activities:

- Radan for GPR measurement and processing.
- In-house Matlab tool for GPR data analysis. In-house Matlab tool for FDTD 1D simulation. In-house Matlab tool for 1D analytical simulation of GPR signal. In-house Matlab tool for modeling permittivity using mix lows.

Laboratoire Matériaux et Durabilité des Constructions, LMDC
Université Paul Sabatier
&
Institut National des Sciences Appliquées
135 Av. de Rangueil
31077 Toulouse cedex
France

Jean-Paul Balayssac (MC Member)
Gilles Klysz

Research activities within the COST Action TU1208:

- Application of GPR on reinforced concrete structures: detection and localization of reinforcement, moisture assessment, chloride contamination assessment.
- Use of GPR on masonry structures: detection of voids and thickness measurements.
- Development of NDT techniques complementary to GPR: resistivity.
- Use of artificial neural networks for processing of NDT measurements including GPR.

Available GPR equipment:

- GPR units: GSSI SIR 2000, SIR 20 and SIR 30.
- Antennas: GSSI 1500 MHz (2), 1600 MHz (1), 2600 MHz (2).
- Network analyser (Agilent E5062A).

Other available equipment useful for the Action's activities:

- Resistivity measurement: Ohmega and Tigre (Allied Associates Geophysical LTD).
- Potentiostat-Galvanostat (Gamry) for Electrochemical Impedance Spectroscopy.
- Instrumented concrete elements.
- Masonry full-scale element.
- Climatic chambers, several aging equipments for concrete (carbonation chamber, chloride diffusion, alkali-aggregate reactor, etc), several equipments for the characterization of concrete and soils.

Software, useful for the Action's activities:

- Commercial and in-house software for GPR data analysis.
- Numerical model of GSSI 1.5 GHz antenna.
- Numerical model of resistivity measurement on reinforced concrete.

FRANCE

Further TU1208 Partners in France:

University Nice Sophia Antipolis

Sophia Antipolis, France

Christian Pichot du Mezeray (MC S Member)

Clermont-Ferrand University

Clermont Ferrant cedex, France

Khalil El Khamlichi Drissi

University of Nantes

Nantes, France

Cristophe Bourlier

Laboratoire d'Etudes et de Recherches sur les Matériaux

Arles cedex, France

Jean-Luc Garciaz

Université Paris Sud

Orsay cedex, France

Albane Saintenoy

GERMANY

BAM – Federal Institute for Materials Research and Testing
Division 8.2 - Non-Destructive Damage Assessment and Environmental Measurement Methods

Unter den Eichen 87, 12205 Berlin, Germany

Thomas Kind (MC Member)
Christiane Trela (MC Member)
Christian Köpp (MC S Member)

Research activities within the COST Action TU1208:

- Development of mechanical and electronic devices, for automated scanning on flat surfaces.
- Application of GPR to building and transport infrastructures, using innovative inspection procedures (grid measurements, different antenna polarisation, antenna arrays).
- Determination of the moisture content in concrete and masonry structures, in reflection and transmission mode.
- Development and definition of testing and calibration procedures for GPR equipment.
- Simulation of wave propagation.
- Development and construction of large-size testing specimens (typically 1.5x2.0x0.5 m).

Available GPR equipment:

- GSSI, MalaGS and Hilti multi- and single-channel systems, with ground-coupled antennae and air-coupled antennae ranging from 200 MHz to 2600 MHz.

Other available equipment useful for the Action's activities:

- Various automated scanning systems, for non-destructive testing of both horisontal and vertical flat infrastructures.
- Equipment of ultrasonic, impact echo and other non-destructive testing methods.
- Large testing hall and test site for research and training on large test specimens.

Software, useful for the Action's activities:

- 2D processing and 2D/3D interpretation software for seismic and GPR data (ReflexW and in-house). 2D and 3D SAFT reconstruction software (in-house together with UNI Kassel).
- 2D/3D electromagnetic simulation software: ReflexW and CST Microwave Studio.

GERMANY

DMT GmbH & Co. KG

Main Office:
Am Technologiepark 1, D-45307 Essen

Project Office Hamburg:
Grosse Bahnstrasse 31, D-22525 Hamburg,
Germany

Joerg Endom (MC S Member)

Research activities within the COST Action TU1208:

- Application of GPR to pavement: diagnosis of road damages, pavement monitoring and management planning, automatic detection and thickness measurement of pavements' layers, moisture content and density measurement in road subgrade, analysis of asphalt properties in flexible and rigid pavements.
- 16 government approved expert bodies for safety, 3 accredited testing laboratories.
- Subsidiary of TUEV NORD GROUP.

Available GPR equipment:

- GSSI SIR20 and SIR3000 systems, ground- coupled antennae 270 MHz - 1600 MHz centre frequencies.
- Mala Geoscience CUII systems, ground-coupled antennae 100 MHz - 1600 MHz centre frequencies and sewer antenna, 200 m cable, 1600 MHz centre frequency.
- IDS Hi-Mod RIS DAD system, ground-coupled antennae 200 MHz - 900 MHz, Horn antennae 2 x 2000 MHz centre frequency.
- DABOR directional borehole radar, 50 MHz - 250 MHz centre frequency.
- Sensors & Software pulseEKKO 1000 systems, ground-coupled antennae 100 MHZ - 1200 MHz centre frequencies.

Other available equipment, useful for the Action's activities:

- Impact Echo CTG-1, manufactured by Olson Instruments Inc.
- Several systems for land surveying, manufactured by Leica, Trimble
- Geophysical equipment (seismics, geoelectrics, geomagnetics, electromagnetics, gravity)

Software, useful for the Action's activities:

GIS software.

GERMANY

Fraunhofer Institute For High Frequency Physics And Radar Techniques FHR- Department Cognitive Radar

Fraunhoferstraße 20, 53343 Wachtberg,

Maria A. Gonzalez Huici

Research activities within the COST Action TU1208:

- Characterization and design of UWB antennas and radar for farming applications.
- Underground target detection and clutter removal.
- Investigation of imaging techniques for detection and localization of scatterers. Underground target classification strategies.
- Advanced signal processing methods.
- Solution of inverse problems (sparse recovery, tomographic inversion).
- Realistic modeling of GPR scenarios using full-wave simulators.

Available GPR equipment:

- ERA Impulse Radar System, 2 Ground-coupled antennae 2 GHz, 500 MHz.
- CaviDet experimental UWB array system, 2 Shielded bow-tie dipoles, 1Tx, 2Rx, 350 MHz-1.1 GHz.
- Schwarzbeck: Logperantenna 200 MHz-1.3 GHz, single polarisation horn antenna BBHA 9120 A (800 MHz- 5 GHz), dual polarised broadband antenna BBHX 9120 LF (1-8 GHz), linear polarised double-ridged broadband horn antenna BBHA 9120 C (2-18 GHz).

Other available equipment useful for the Action's activities:

- Oscilloscope LeCroy 20GHz 4x 40GS/s. Portable PC oscilloscope PicoScope PS9211A, 12GHz.
- Arbitrary waveform generator AWG Euvis 0-4 GHz.
- Rohde & Schwarz: VNA ZVA40 and Spectrum Analyser FSP 9 kHz-40 GHz.
- Anechoic Chamber: AEM (1-40 GHz) and PSR (100 MHz-20 GHz).
- Rohde & Schwarz: SMR20 Generator (1GHz-20 GHz), SMB 100A 100 kHz-20 GHz.

Software, useful for the Action's activities:

- 3D electromagnetic simulation software: COMSOL Multiphysics, version 4.3.
- MatLab, Signal Processing Toolbox.
- In-house software for GPR signal processing, GPR image reconstruction, target detection and classification.

GERMANY

Agrosphere (IBG-3)
Institute of Bio- and Geosciences
Forschungszentrum Jülich

Leo-Brandt-straße, Jülich, Germany

Jan van der Kruk Anja Klotzsche François Jonard

Research activities within the COST Action TU1208:

- Development and application of off-ground GPR full-waveform inversion (FWI) methods to: determine quantitative permittivity and conductivity values, which are related with water and chloride content, and corresponding gradients; simultaneously determine an effective wavelet and quantitative permittivity and conductivity values in 3D horisontally layered media; simultaneously invert high resolution permittivity and conductivity properties in 2D media.
- Development of 3D true-amplitude migration/imaging of GPR data.
- Development of high-resolution exact-field GPR forward modelling. Development of full-waveform forward and inverse methods using parallelised software, based on MPI and OPENMP.
- Development of advanced GPR data processing techniques.
- Effective characterisation of off-ground, on-ground and crosshole GPR antennas using an effective wavelet estimation procedure.

Available GPR equipment:

- PulseEKKO PRO: Ground-coupled antennae 100 - 1000 MHz centre frequencies.
- PulseEKKO PRO: Borehole antennae 50 - 200 MHz centre frequencies.
- GSSI SIR20 & SIR3000: Ground-coupled antennae 200– 2600 MHz centre frequencies.
- GSSI SIR20 & SIR3000: Air-launched antenna 1000 MHz centre frequency.

Other available equipment useful for the Action's activities:

- Multi-coil EMI equipment.
- TDR & Theta Probes.
- Wireless sensor networks for measuring soil water content.

Software, useful for the Action's activities:

- In-house software for: off-ground GPR FWI, to determine quantitative permittivity and conductivity values, related with water and chloride content and corresponding gradients; on-ground GPR FWI, to simultaneously determine an effective wavelet and quantitative permittivity and conductivity values in 3D horizontally layered media; crosshole GPR FWI, to simultaneously invert high resolution permittivity and conductivity properties in 2D media.
- In-house software for dispersion inversion of waveguide dispersive GPR data.
- In-house software for 3D true-amplitude migration/imaging of GPR data.

GERMANY

Karlsruhe Institute of Technology
Institut für Hochfrequenztechnik und Elektronik IHE

Kaiserstr. 12 76131 Karlsruhe, Germany

Mario Pauli Werner Wiesbeck

Research activities within the COST Action TU1208:

- Electromagnetic Simulation and measurement.
- UWB research and technology.
- MIMO GPR.
- Through the wall Radar.
- Target classification.
- Multi-modal Synthetic Aperture Radar (SAR).
- Antenna and Antenna Array Design.
- FMCW Radar System Design and Processing.

Available GPR equipment:

- Linear polarised antennas 0.5–10.6 GHz; dual orthogonal polarised antennas 2–10.6 GHz.
- Tx/Rx signal power dividers.
- UWB pulse sources (>80 ps). Arbitrary Waveform Generators.
- High Speed Oscilloscopes.
- Several Network Analyzers and Spectrum Analyzers.
- TDR System.

Other available equipment useful for the Action's activities:

- Several signal sources (pulse, FM).
- Volume scanning Radar.
- Several stepper motors and measurement setup for 3D measurements.
- Anechoic Chamber.
- Several Broadband Antennas (2-20 GHz, 4-40 GHz). Slotted Waveguide Antennas.

Software, useful for the Action's activities:

- Multi layer EM propagation software.
- FDTD & FEM Software for EM field calculations.
- High Accuracy FMCW Processing Algorithms.
- Standard Computational Software.

GERMANY

Ruhr-Universität Bochum

Universitätsstraße 150, 44801 Bochum,
Germany

Martin Radenberg
Miomir Miljković

Research activities within the COST Action TU1208:

- Application of GPR in evaluating asphalt and concrete pavements by considering layer thicknesses and conditions, object positioning and recognition, density and moisture of materials.
- Application of other non-destructive evaluation methods in pavement engineering.
- Development of advanced measurement methods in pavement engineering, compatible to GPR.
- Laboratory testing of mechanical and other properties of pavement materials.

Available GPR equipment:

- GPR equipment with antennas of 1 GHz and 2 GHz centre frequencies.

Other available equipment useful for the Action's activities:

- Non-destructive impulse hammer for evaluating the bonding between asphalt pavement layers.
- Benkelman beam equipment.
- Equipment for obtaining core samples from pavement layers.
- Large laboratory equipped for advanced testing of asphalt and constituent materials.

Software, useful for the Action's activities:

Software for 2D and 3D processing of GPR measurement data.

GERMANY

Technische Universität Ilmenau
Electronic Measurement
Engineering Group

Max-Planck-Ring 14, 98693
Ilmenau,Germany

Jürgen Sachs Rudolf Zetik

Research activities within the COST Action TU1208:

- Development and implementation of pseudo-noise UWB radar.
- Design of UWB signal generators and data acquisition circuits based on integrated Si-Ge circuits.
- Industrial and medical application of UWB sensing.
- Non-destructive testing in civil engineering.
- UWB localisation and navigation in multi-path environment.
- UWB real-time channel sounding.
- UWB sensor networks.
- Through Wall Detection, localisation and tracking of persons.
- Vital sign detection (heartbeat and breathing).

Available GPR equipment:

- Pseudo-noise UWB Radars of ILMSENS SH-3000 series (bandwidth up to 12 GHz).
- Scanners (1D, 2D, 3D).
- Sandbox with scanner.
- UWB antennas (Horn, Vivaldi, dual polarised antennas).

Other available equipment useful for the Action's activities:

- RF-signal generators; Spectrum-Analysers; Network Analysers; Time Domain Reflectometer.
- UWB channel sounder for baseband, FC band and 60GHz band.
- Anechoic chamber.

Software, useful for the Action's activities:

- In-house Matlab toolbox for detection, localisation and tracking of targets and imaging of environments.
- Software for field simulations (HFSS, CST etc.)

Further TU1208 Partners in Germany:

Federal Highway Research Institute (BASt), Department of Highway Construction Technology, Section Design and Stucture of Pavement

Bergisch Gladbach, Germany

Rabe Rolf

Airbus Gmbh, Microwave and RF Department

Friedrichshafen, Germany

Simone Meschino

GREECE

Aristotle University of Thessaloniki

Department of Geophysics, School of Geology
Panepistimioupolis, 54124 Thessaloniki, Greece

Nectaria Diamanti

Research activities within the COST Action TU1208:

- Application of GPR to archaeological prospection, pavement evaluation, tunnel inspection, utility detection.
- Numerical modelling of GPR.
- Development of numerical models of GPR antennas.

Available GPR equipment:

- Sensors & Software: pulseEKKO 1000 (110, 225, 450 & 900 MHz).
- MALÅ: CUII (250, 500 & 800 MHz).

Other available equipment useful for the Action's activities:

- IRIS Instruments SYSCAL Pro.
- Geoscan Research RM15 Advance.
- ABEM WADI VLF.
- Scintrex Envi Mag.

Software, useful for the Action's activities:

- GPR 3D simulating tools.
- GPR processing tools.
- Forward modelling and inversion software for electrical resistivity tomography data.

GREECE

GEOSERVICE: Geological & Geophysical Consultants

35, Lykaiou St., 114 76 Athens, Greece

Pepi Avlonitou
Klisthenis Dimitriadis
Yannis Konstantakis

Research activities within the COST Action TU1208:

- Adaptation of high frequency GPR for stone assessment of Ancient Monuments, supporting restoration processes using nanomaterials based on Calcium Hydroxide saturated solutions.

Available GPR equipment:

- MALA GEOSCIENCE Ramac CUII GPR system with XV Monitor.
- MALA Shielded antennas, all sets: 100 – 2400 MHz antennas.
- MALA Rough Terrain Concept (RTC) 25 MHz deep penetration antenna.
- MALA Roadcart for road pavement assessment.

Other available equipment useful for the Action's activities:

- ABEM SAS 4000 Terrameter with ES4-64 electrode selector – 640 m continuous ERT profiling.
- 24 channel digital seismograph DAQLINK III (Seismic Source-USA) with all related gear.
- 900 m geophysical well logging system – 400 m borehole video logger.
- ABEM WADI VLF (Very Low Frequency) Instrument.
- VES geoelectrical equipment for deep geothermal exploration studies.

Software, useful for the Action's activities:

- MALA Object Mapper.
- REFLEXW Sandmeier software.
- MALA EASY 3D.
- Res2Dinv software.

GREECE

Geoterra Ltd: Geomechanics & Quality Control Laboratory

12 Anthrakorichon St., 142 35 Nea Ionia, Athens, Greece

Dimitris Xirouchakis

Research activities within the COST Action TU1208:

- Application of GPR to Civil and Geological Engineering.

Other available equipment useful for the Action's activities:

- Sampling and NDT systems for Civil and Geological Engineering investigations.

Software, useful for the Action's activities:

- MATLAB.

GREECE

National Technical University of Athens (NTUA)

Department of Transportation Planning and
Engineering Laboratory of Pavement Engineering
5, Iroon Polytechniou Str., Zografou Campus, Athens

Andreas Loizos (Action Vice-Chair)
Christina Plati (MC Member)

Research activities within the COST Action TU1208:

- Application of GPR in buildings, bridges, railways and pavements evaluation.
- GPR surveys for estimation of pavement layer thicknesses, measurement of voids content in asphalt layers, detection of the presence of moisture, detection of the location and extent of stripping.
- Use of GPR with other non-destructive testing methods for quality control and assurance of transportation infrastructure.

Available GPR equipment:

- Ground-coupled antenna 400 MHz centre frequency, GSSI.
- Ground-coupled antenna 1500 MHz centre frequency, GSSI.
- Air-launched horn antenna 1 GHz centre frequency, GSSI.
- Air-launched horn antenna 2 GHz centre frequency, GSSI.

Other available equipment useful for the Action's activities:

- Light Falling Weight Deflectometer (LFWD), manufactered by AL-Engineering Oy.
- Falling Weight Deflectometer (FWD), manufactered by Dynatest.

Software, useful for the Action's activities:

Road Doctor software: Roadscanners.

Technical Universtity of Crete
Mineral Resources Engineering Department

Polytechnioupolis, 73100 Chania, Crete, Greece

Antonis Vafidis
Nikos Economou
George Kritikakis
Nikos Andronikidis
Nikos Spanoudakis

Research activities within the COST Action TU1208:

- Development of signal processing algorithms.
- Application of GPR in civil engineering and archaeometry
- GPR geotechnical and environmental applications.

Available GPR equipment:

- Pulse Ekko 1000, with ground coupled antennas 110 – 225 – 450 – 900 – 1100 MHz.

Other available equipment useful for the Action's activities:

- AGI Sting R1 with electrodes for electrical tomography.
- Geometrics 12-channel Geode seismograph with geophones and seismic source.

Software, useful for the Action's activities:

- Promax seismic data processing package.
- Paradigm seismic data processing package.
- In-house Matlab software for conventional and advanced (attribute analysis and classification) GPR data processing (GPRPRO).
- In-house Matlab software for multi channel surface waves analysis (Krisis).
- In-house Matlab codes for advanced GPR data processing (spectral balancing and time varying deconvolution).
- Pulse Ekko GPR data processing package.
- Seismic tomography Geometrics' software.

Res2Dinv, Res3Dinv and EarthImager for 2D and 3D electrical tomography data processing and imaging.

The Hong Kong Polytechnic University

Hong Kong

Wallace Wai-Lok Lai (MC Observer)

Railway Procurement Agency of Ireland

Parkgate Business Centre, Parkgate St, Dublin 8
Ireland

Patrizio Simeoni (MC Member)

Research activities related to the Action:

- Using GPR to detect pipes when developing railway infrastructures.
- Study of penetration of electromagnetic fields in lossy media.

Available GPR equipment:

NA.

Other available equipment, useful for the Action's activities:

- Leica Total Stations with associated 360 prisms, poles, etc:
  - 1no. TS15, 1"; 1no. TS30, 0.5"; 2no. 1201, 1".
- Leica Precise Levels
  - 4no. DNA03 c/w Invar Staves.
- Magellan GPS
  - 4no. Promark 500 Antenna c/w MM100 loggers/GIS Unit;
  - Also c/w 4no. GPS VRS Licences with OSi ITM Network.
- Laser Scanner
  - 1no. Faro Focus 3d 120m
- Track Surveying
  - 1no. GRP1000 Amberg Trolley
- Miscellaneous Kit including:
  - Leica Forced Centred Traverse Kit; Leica Distos; Long / Short Tapes, Ranging Rods; Geismar Gauge Bars; Measuring Wheels.

Software useful for the Action's activities:

- ArcGIS.
- Microsoft Visual Studio.
- IAR microcontrollers development kit (and hardware JTAG debugger).
- Opensource Posix compilers.

Further TU1208 Partners in Ireland:

The Trinity College
The Telecommunications Research Centre

Dublin, Ireland

Giuseppe Ruvio (MC Member)

ISRAEL

HIT Holon Institute of Technology

Holon, Israel

Motti Haridim (MC Member)

.

ITALY

University of Catania - Department of Electrical Electronics and Computer Engineering

Viale A. Doria 6, 95126, Catania, Italy

Loreto Di Donato

Research activities within the COST Action TU1208:

- Development of full-wave methods for the solution of electromagnetic forward and inverse scattering problems.
- Development of qualitative imaging approaches for the localisation and geometrical characterisation of buried targets from GPR data.
- Development of imaging approaches for quantitative electromagnetic characterisation of subsurface scenarios from GPR data.
- Design and experimental characterisation of planar antennas.

Available GPR equipment:

No available GPR equipment.

Other available equipment useful for the Action's activities:

- Spectrum analyzer Anritsu MS2668C 9KHz - 40GHz.
- Vector Network Analyzer Anritsu 37369D 40 MHz - 40 GHz.
- Planar antennas and microwave components.
- Anechoic chamber.

Software, useful for the Action's activities:

- Inhouse MoM and FDTD codes for the electromagnetic simulation of 2D and 3D GPR scenarios.
- 3D electromagnetic simulation suite *Ansys HFSS*.

2.5D electromagnetic simulator *Ansoft ADS* for stratified structures.

ITALY

University of Florence
Department Of
Information Engineering

Via Santa Marta 3 50139 Firenze, Italy

Massimiliano Pieraccini Lorenzo Capineri

Research activities within the COST Action TU1208:

- Electronic and System Design of GPR. Prototyping of GPR and GPR antennas.
- Experimental characterisation of GPR antennas.
- In-field test of GPR.
- Masonry investigation by GPR.
- Signal and image processing for GPR.
- Robotic and mechanical scanners for GPR.

Available GPR equipment:

- ORFEUS GPR CW-SF 100 MHz-1 GHz.
- Ultra Wide Band RISEM GPR CW-SF 4 - 8 GHz.
- Holographic radar RASCAN 4 GHz.
- 3m × 2m mechanical scanner.
- ROS (Robot Object Scanner).

Other available equipment useful for the Action's activities:

- Oscilloscope Agilent Infinium MSO8104A 1 GHz 4Gsample/s.
- Tektronix TDS5034B 350 MHz 5Gsample/s.
- VNAs HP 8753D (30 KHz - 6 GHz) and HP 8720A (130 MHz - 20 GHz).
- Spectrum Analyzer HP 8569B 22 GHz.
- Frequency Counter HP 5342A 18 GHz.
- Pulse Generator HP 8011A.
- Synthesizer HP 8672A (2 - 18 GHz).
- Powermeter HP 435A.
- Interferometric radar IBIS 17 GHz.
- Test site for buried objects.

University of Genoa - Department of Electrical, Electronic, Telecommunication Engineering and Naval Architecture

Via Opera Pia 11/A, 16145 Genova, Italy

Claudio Estatico
Alessandro Fedeli
Matteo Pastorino
Andrea Randazzo

Research activities within the COST Action TU1208:

- Development of numerical methods for the solution of electromagnetic inverse-scattering problems by buried structures.
- Development of optimisation techniques based on stochastic methods.
- Development of localisation approaches for buried structures, based on Support Vector Machines.
- Synthesis and analysis of smart antennas.
- Experimental studies using prototypes of imaging systems.

Available GPR equipment:

No available GPR equipment.

Other available equipment useful for the Action's activities:

Anechoic chamber.

Software, useful for the Action's activities:

- Custom electromagnetic direct solvers based on Method of Moments, Finite Difference Time Domain method, and Finite Volume Time Domain method.
- Custom electromagnetic imaging software based on stochastic and deterministic inversion algorithms.

IDS Ingegneria dei Sistemi SpA

Via E. Calabresi 24, 56121 Pisa, Italy

Guido Manacorda (MC Member)

Research activities within the COST Action TU1208:

IDS Ingegneria dei Sistemi SpA is an Italian enterprise providing high technology services and specific SW-HW solutions in civil and defence areas, as well as SW-HW system solutions aimed at specific agency needs (Aeronautical, Space, Telecom, etc.).
IDS´s staff is composed of approximately 450 people, 80% with at least a University degree. IDS organisation is structured into business areas to provide customers with specialised solutions by means of skilled personnel who consistently integrate experience and knowledge into design frameworks and tools. The IDS Business Areas are:

- GPR Division;
- Navigation-aids Division;
- Naval Division; and
- Aeronautical Division.

Available GPR equipment:

The GPR Division is responsible for Ground Propagating Radar activities. The Division has designed and manufactures innovative GPR equipment (the RIS systems suite), including a range of Tx/Rx antennas (low/high-frequency, borehole, co/cross-polarised) and dedicated software tools for covering a wide variety of requirements for different applications.
IDS has the complete technology (HW and SW) for end-to-end development of GPR.
IDS GPR systems are being successfully commercialised in Italian and International markets (EU and extra-EU) by using a national and foreign distributors' network.

Other available equipment useful for the Action's activities:

- Radar and Signature Laboratory;
- Low-Frequency Electromagnetic Laboratory;
- High-Frequency Electromagnetic Laboratory;
- System's Simulation Laboratory;
- Information Technology laboratory; and
- Electronic Circuits Laboratory.

ITALY

Institute for Electromagnetic Sensing of the Environment - National Research Council of Italy (CNR)

Napoli & Lecce

Francesco Soldovieri, Ilaria Catapano, Lorenzo Crocco
Nicola Masini, Raffaele Persico

Research activities within the COST Action TU1208:

- Development of optimised linear and non-linear inverse scattering approaches for 2D and 3D qualitative (geometrical features) and quantitative (electromagnetic parameters) imaging of buried dielectric, metallic and magnetic targets, and their validation against simulated and experimental GPR data.
- Development of 2D and 3D imaging approaches for Through-the-Wall imaging.
- Development of approaches for the imaging of buried targets by means of innovative GPR systems such as: airborne GPR systems, holographic radars, differential GPR systems, GPR systems equipped with an array of transmitting and receiving antennas.
- Development and optimisation of strategies aimed at detecting and monitoring vital signs (heartbeat, breathing, and so on).
- Development of information fusion strategies for the integration of data acquired by means of different electromagnetic sensors.
- Use of standard and microwave enhanced GPR systems in archaeology, cultural heritage diagnostic, geophysics, security, infrastructure monitoring.

Available GPR equipment:

- IDS RIS-2K. Shielded antennas with 200 MHz, 600 MHz and 2 GHz centre frequency.
- Rascan 4/4000 holographic radar.

Other available equipment useful for the Action's activities:

- Signal Generator working in the 250-4000 MHz frequency band.
- Power sensor working in the 50-4000 MHz frequency band.
- Two broadband horn antennas working in the 800-8000 MHz frequency band.

Software, useful for the Action's activities:

- In-house software for simulating scattering phenomenon in 2D and 3D homogeneous scenarios, characterised by electric and magnetic non homogeneous objects, and in 2D and 3D layered structures, characterised by electric non homogeneous objects.
- In-house software for 2D and 3D model based linear and non-linear imaging of objects.
- IDS GRED/3D software. Multiphysics engineering simulation software: COMSOL.

ITALY

Seconda Università di Napoli
Dipartimento di Ingegneria Industriale e Dell'Informazione

Via Roma 29, 81031 Aversa, Italy

Giovanni Leone
Raffaele Solimene

Research activities within the COST Action TU1208:

- Development of tomographic algorithms for non-destructive electromagnetic diagnostics.
- Development of advanced GPR prospecting methods for the detection and localisation of buried cavities and pipes.
- Development of advanced GPR prospecting methods for intra-wall diagnostics for masonry structures monitoring and ducts and rebars detection.
- Development of soil characterisation and clutter rejection methods in GPR prospecting.
- Algorithms for vital sign detection for humans below debris or behind barriers.

Available GPR equipment:

- IDS RIS K2. Ground-coupled antennae 200 MHz - 600 MHz centre frequencies.
- IDS Prototypal stepped frequency GPR for wall diagnostics. Frequency band [800 MHz - 4 GHz], configurations: planar multibistatic or multiview/multistatic.

Other available equipment useful for the Action's activities:

- Shielded anechoic chamber 3m x 4m x 3m.
- VNA Anritsu 37225B [20 MHz -13.5 GHz] and VNA Anritsu MS4624D [10 MHz - 9 GHz].
- Different types of antennas from 300 MHz to 18 GHz.

ITALY

Università Degli Studi Di Napoli
Parthenope Departimento Di Ingegneria

Centro Direzionale di Napoli Isola C4
80143 Napoli, ITALY

Vito Pascazio
Gilda Schirinzi
Michele Ambrosanio
Roberta Autieri
Giampaolo Ferraioli
Fabio Baselice
Ferdinando Nunziata
Gianfranco Mattuozzo

Research activities within the COST Action TU1208:

- Development of new Imaging Techniques for GPR Applications based on 2D and 3D tomographic approaches.
- Development of Nonlinear e Linearized Imaging Technques for GPR applications.
- Development of Imaging Techniques based on Compressive Sensing.
- Application of Ground Penetrating Radar to Demining.
- Development of numerical techniques for the localization of buried cylindrical structures from GPR data.

Other available equipment useful for the Action's activities:

- Fully equipped Anechoic Chamber (8m x 3m x 3m)
- 2 Fully equipped Reverberating Chambers (2m x 2m x 2m) (4m x 5m x 6m)
- 2 Network Analyzers
- 2 Spectrum Analyzers
- 1 Power Amplifier
- 2 Modulated Signal Generators
- 2 Rotating Platforms
- Circuits and Devices for Antennas and Microwaves
- E.M. Fields Sensors

Software, useful for the Action's activities:

- In House software (developed since 1994) for Microwave Tomography
- In House software (developed since early '80) for Antenna Diagnosis and Syntesys
- In House software for 2D electromagnetic analysis by using Finite Element Method
- 2D and 3D Electromagnetic Simulation Software (CST, Ansoft HFSS, GPRmax)

ITALY

University of Perugia – Dipartimento di fisica e geologia

Via Alessandro Pascoli, s.n.c.
06123 Perugia PG, Italia

Maurizio Ercoli, Cristina Pauselli
Costanzo Federico

Research activities within the COST Action TU1208:

- High resolution imaging of buried 2D and 3D structures.
- Common offset, multi-fold data processing and velocity analysis.
- Applications of Ground Penetrating Radar in civil engineering.
- Advanced interpretation GPR-based techniques for the localisation of buried structures.
- Applications of GPR in civil engineering, geotechnics and cultural heritage conservation.
- Development of advanced GPR data processing techniques.
- Numerical simulations for the localisation of buried structures from GPR data.
- GPR-GNSS real-time data integration.

Available GPR equipment:

- Radar system New Zond 12e Advanced (Radar System Inc.), 2 channels.
- Antennae centre frequencies: 38,5-75-150 MHz (unshielded, dipole, air-launched)
- Antennae centre frequencies: 100-300-500-1500 MHz (shielded, ground-coupled)
- Antennae centre frequency: 750 MHz (shielded, air-launched).
- In house realised shockproof karts and GNSS frames.

Other available equipment useful for the Action's activities:

- GNSS receivers Topcon GR5 (n°2)
- Controller Topcon FC336 (n°1)
- Led Panel for Precision Farming Topcon GX-45, adapted for 3D GPR survey.

Software, useful for the Action's activities:

- Processing Softwares: ReflexW, Prism
- Display Softwares: Prism Easy 3D, Prism Layer 3D, MATGPR, Octave routines, etc.
- Interpretation Softwares: ReflexW, OpendTect software (Free and OpenSource)
- 2D electromagnetic simulation software: ReflexW, MATGPR.
- Zond software packages for ERT and seismic processing.

ITALY

Roma Tre University
Department of Engineering

Via Vito Volterra 62, 00146 Rome, Italy

Lara Pajewski (Action Chair)
Andrea Benedetto (MC S Member)
Francesco Benedetto
Luca Bianchini Ciampoli
Fabrizio D'Amico
Maria Rosaria De Blasiis
Gaetano Giunta
Wolfgang Kusayanagi
Daniele Pirrone
Fabio Tosti

Research activities within the COST Action TU1208:

- Application of GPR to road pavement: diagnosis of road damages, pavement monitoring and planning of pavement management, automatic detection and thickness measurement of pavements' layers, moisture content and density measurement in road subgrade, analysis of asphalt properties in flexible pavements, diagnosis of plastic material infiltration in road subgrade. GPR application to airports and railways.
- Soil moisture evaluation using GPR and moisture spatial field analysis.
- Development of full-wave methods for the solution of 2D and 3D electromagnetic forward-scattering problems. Numerical techniques for the localisation and characterisation of buried structures.
- Development of advanced GPR data processing techniques.
- Synthesis, analysis and experimental characterisation of antennas.

Available GPR equipment:

- IDS RIS 99. Ground-coupled antennae 600 - 1600 MHz centre frequencies.
- IDS RIS-2K. Ground-coupled antennae 600 - 1600 MHz centre frequencies.
- IDS RIS Hi-PAVE HR1000. Air-launched antenna 1000 MHz centre frequency.

Other available equipment useful for the Action's activities:

- Light Falling Weight Deflectometer PRIMA 100, manufactured by Carl Bro Company.
- Gwinstek Spectrum analyzer and Narda portable field meter, for broadband/selective environmental measurement of EM fields, from 4 Hz to 9.25 GHz.

Software, useful for the Action's activities:

- In house and commercial software for radar signal processing and tomography.
- In-house software implementing the Cylindrical-Wave Approach for EM simulation.
- 3D EM simulation commercial software: CST Microwave Studio and Ansoft HFSS.

ITALY

La Sapienza University of Rome
Department of Information Engineering, Electronics and Telecommunications

Via Eudossiana 18, 00184 Roma, Italy

Fabrizio Frezza (MC S Member) Vincenzo Ferrara
Fabio Mangini Santo Prontera

Research activities within the COST Action TU1208:

- Development of full-wave methods for the solution of electromagnetic forward-scattering problems by buried two-dimensional and 3-D structures in lossy media.
- Numerical techniques for the localisation of buried cylindrical structures .
- Synthesis, analysis and experimental characterisation of antennas.
- Applications of GPR and other non-destructive testing methods in archaeological prospecting and cultural heritage diagnostics.
- Application of GPR to the localisation and vital signs detection of trapped people.

Available GPR equipment:

- GSSI SIR 2000 with an antenna Radar Team SUB-ECHO HBD 300.
- Indoor and outdoor experimental facilities for underground measurements.

Other available equipment useful for the Action's activities:

- Portable Vector Network Analyzer Agilent PNA E8363B (10 MHz - 40 GHz)
- Shielded anechoic chamber Emerson&Cuming with automatic positioning system for antenna measurements.
- Vector network analyzer, model HP8530A, suitable for antennas measurements.
- Portable field meters PMM 8053A (with probes EP330, EP33M, EHP50C) and Wandel & Goltermann EMR 300 (with probe Type 18), covering the whole band 5 Hz - 3 GHz.
- Mixed analog-digital oscilloscope Tektronics MSO 2012.

Software, useful for the Action's activities:

- In-house software implementing the Cylindrical-Wave Approach for the electromagnetic simulation of 2D GPR scenarios. In-house software for the electromagnetic simulation of 3D forward-scattering problems.
- 3D electromagnetic simulation software: CST Microwave Studio, Ansoft HFSS and Designer, COMSOL Multiphysics.
- LabVIEW software.
- Intel Visual Fortran.
- MatLab, Mathematica Personal Grid.

University of Trento – ELEDIA Research Center@DISI

Via Sommarive 5, I-38123 Trento, Italy

Andrea Massa (MC Member)
Luca Manica, Giacomo Oliveri, Lorenzo Poli,
Paolo Rocca, Marco Salucci, Federico Viani

Research activities within the COST Action TU1208:

- Development of inversion algorithms applied to 2D/3D GPR problems.
- Development of a real-time identification and classification tool for buried object retrieval through GPR data, by means of learning-by-example strategies.
- Application of microwave inversion techniques to GPR investigation, specifically in the field of UXO retrieval and classification, dangerous material identification, and stand-off detection for safety and security applications.
- Development of full-wave methods for the solution of electromagnetic forward-scattering problems by buried two-dimensional and three-dimensional structures.
- Study, design, realisation, analysis and experimental validation of wideband and multiband antennas working in the GPR frequency regime.
- Synthesis and simulation of large antenna arrays for remote sensing and GPR purposes.
- Electromagnetic compatibility measurements and testing.

Available GPR equipment:

NA.

Other available equipment useful for the Action's activities:

- Wideband and multiband antenna. Wideband and narrowband signal generators. Low noise RF Amplifiers. Wideband digital oscilloscopes.
- Vector Network Analyzer, RF cables and connectors, power splitters and combiners.
- Anechoic chamber for near field and far field measurements.

Software, useful for the Action's activities:

- Software for signal acquisition, digital processing, 3D radiation pattern measurements.
- In-house software implementing MoM, FEM and hybridisation with PO for the electromagnetic simulation of 2D/3D GPR scenarios.

Further TU1208 Partners in Italy:

University of Bari

Bari, Italy

Loredana Matera

Università di Cagliari

Cagliari, Italy

Gian Piero Deidda
Patricia Diaz De Alba
Caterina Fenu
Luisa Fermo

Universityà Mediterranea di Reggio Calabria

Reggio Calabria, Italy

Tommaso Isernia

INFN & University of Naples “Federico II”, Naples

Naples, Italy

Salvatore Capozziello
Mariafelicia De Laurentis
Giuseppe Longo
Maurizio Paolillo

Provincia di Rieti

Rieti, Italy

Carmelo Tulumello

Provincia di Roma

Rome, Italy

Francesco F. Valeri

Politecnico di Torino

Torino, Italy

Simone Ciccia

JORDAN

Princess Sumaya University for Technology

Amman, Jordan

Abdallah Al Zoubi (MC Observer)

LATVIA

Transport And Telecommunication Institute

1 Lomonosova Street, Riga, LV-1019, Latvia

Valerij Kutev (MC Member)
Alexander Krainyukov
Daniil Opolchenov

Research activities within the COST Action TU1208:

- Development of solving algorithms applied to GPR structural inverse problem.
- Development of full-wave methods for the solution of electromagnetic forward-scattering problems by buried two-dimensional structures.
- Application of Gound Penetrating Radar to road pavement: diagnosis of road damages, detection and thickness measurement of pavements' layers.
- Reconstruction of the geometrical and electrophysical characteristics of the roadway by radar probing.
- Hardware implementation of GPR structural inverse problem solving.

Available GPR equipment:

- GSSI SIR System-30 Unit.
- GSSI horn antennas with frequency 2 GHz.
- GSSI horn antennas with frequency 400 MHz.

Other available equipment useful for the Action's activities:

- Vector analyzer up to 2.5 GHz.
- Wideband digital oscilloscopes 500 MHz.
- 3 GHz spectrum analyzer.
- Virtex – 7 FPGA Development Board.

Software, useful for the Action's activities:

- Software GSSI RADAN 7.
- In-house software for solving the inverse structural problem of the radar probing roadway.
- In-house Matlab Code.

University of Malta

Msida, Malta

Sebastiano D'Amico (MC Member)

NETHERLANDS

Delft University of Technology
Department of Geoscience and Engineering

Stevinweg 1, 2628 CN, Delft, the Netherlands

Evert Slob (MC Member)
Ralph Feld
Shilong Sun
Alexander Yarovoy

Research activities within the COST Action TU1208:

- Development of full-waveform integral equation methods for modeling electromagnetic scattering problems by buried three-dimensional structures.
- Interferometric applications of GPR that focus on measuring noise in GPR data and from which multi-channel multi-component GPR data can be synthesised.
- Development of advanced data imaging and inversion methods.
- Electromagnetic material characterisation.

Available GPR equipment:

- Pulsekko Pro. Ground-coupled antennas, 100 MHz - 1000 MHz centre frequencies.

Other available equipment useful for the Action's activities:

- In-house built transmission line, for sample characterisation.
- VNA with ridged-horn antenna, for monostatic measurements in laboratory.

Software, useful for the Action's activities:

- In-house software for modeling and inversion of horizontally layered media.
- In-house software for multicomponent multioffset GPR data.

NORWAY

3d-Radar AS

Klæbuveien 196B, 7037 Trondheim,
Norway

Egil Eide (MC S Member)
Jacopo Sala (MC S Member)

Research activities within the COST Action TU1208:

- Design and implementation of stepped-frequency GPR systems.
- Design and implementation of high-resolution 3-dimensional GPR systems.
- Application of GPR to road pavement: diagnosis of road damages, pavement monitoring and planning of pavement management, automatic detection and thickness measurement of pavements' layers, moisture content and density measurement in road subgrade.
- Application of GPR to railway ballast: automatic detection of thickness and ballast fouling.
- Development of advanced GPR data processing techniques for stepped frequency GPR.
- Experimental characterisation of antennas.

Available GPR equipment:

- GeoScope High Resolution Stepped-Frequency GPR
- Antenna array: DX1821 (200MHz- 3 GHz, 21 Channels).
- Antenna array: DX2125 (200MHz- 3 GHz, 25 Channels).
- Antenna array: DX2429 (200MHz- 3 GHz, 29 Channels).

Other available equipment useful for the Action's activities:

Leica RedLine PowerBox RTK GPS system (cm accuracy).

Software, useful for the Action's activities:

- 3dR Examiner GPR post processing software.
- In-house Matlab Code.

Further TU1208 Partners in Norway:

Norvegian University of Science and Technology

Trondheim, Norway

Inge Hoff (MC Member)

Geomaster Corp.

Quezon City, Philippines

Jose Reneirio R. Federizon (MC Observer)

POLAND

AGH University of Science and Technology
Faculty of Geology, Geophysics and Environmental Protection
Department of Geophysics

Mickiewicza Av. 30, 30-059 Cracow, Poland

Jerzy Karczewski

Research activities within the COST Action TU1208:

- Application of electrical (resistivity imaging) and electromagnetic (conductometry, GPR) methods in archaeology.
- GPR and microgravimetric methods for voids and fractured zones detection.
- GPR and geomechanical modeling, for qualitative interpretation of data from mining and urban areas.
- Decrease of ambiguities in GPR detection and monitoring of liquid contaminations in the ground; combining of the results of GPR surveys with the results of numerical modelling of contamination flow in the porous media (using HSSM and other software).
- GPR in mining works: borehole surveys detection of fractured zones induced by mining activity and natural fractures/voids which cumulate water and gas; recognizing of new parts of the rock mass before mining exploitation using borehole radar.
- Complex electrical and electromagnetic measurements for polymetallic prospection.

Available GPR equipment:

- RAMAC/GPR with separated unshielded antennae with freq.: 25, 50, 100, 200, 400 MHz.
- ProEx systems with combined shielded antennae with freq.: 100, 250, 500, 800 MHz.
- Two high-frequency antennae for ProEx: 1200 and 1600 MHz (with EM sensor).

Other available equipment useful for the Action's activities:

- LUND System (ABEM).
- ARES System (GF Instruments).
- Conductivity meters EM-31, EM-34, EM-38 (Geonics Ltd.) Gravity meter CG-5 Autograv (Scintrex Ltd.).

Software, useful for the Action's activities:

- ReflexW software for processing, modelling and visualisation of GPR data.
- Ground Vision and gpr.exe software for acquisition and basic processing and visualisation.
- ANSYS Multiphysics for electromagnetic modelling.

Road and Bridge Research Institute
Pavement Diagnostic Division

Instytutowa str. 1, 03-302 Warsaw, Poland

Lech Krysiński (MC Member)
Jacek Sudyka (MC S Member)

Research activities within the COST Action TU1208:

- Development and implementation of GPR methods, useful in road construction and maintenance practice: analysis of layered structures, assessment of the interlayer connections, detection and examination of cracks, assessment of the construction materials properties including stratification, inhomogeneity and composition.
- Development of measuring procedures, numerical modelling and data processing methods, necessary for measurements interpretation.
- Industrial road measurements, enabling testing and implementation of new techniques.
- Bridge assessment.

Available GPR equipment:

- GSSI air-coupled antennas, with central frequencies 1 and 2.2 GHz, and ground-coupled antennas, with central frequencies 100 and 400 MHz, for traffic measurements.
- 3D Radar 15-channel antenna, step-frequency (300 to 3000 MHz probing, corresponding to central frequency about 700 MHz), for traffic measurements.
- ADEK Percometer for permittivity assessment of flat surface samples and drilling cores.
- Possibility of laboratory modelling of small systems GPR response.

Other available equipment useful for the Action's activities:

- Dynatest Falling and Heavy Weight Deflectoneter (FWD and HWD).
- Greenwood Traffic Speed Deflectometer (TSD).
- Inertial Profilers (Profilographs) for high speed measurements with HD imagining systems (Greenwood 29 laser sensors, Dynatest 1 sensor).
- Drilling equipment for road testing, Skid Resistance Tester SRT3 (standard in Poland).
- Laboratories for asphalt mixtures, concretes and soils testing (composition, mechanical and thermal properties), for ground, basement and bridge assessment.

Software, useful for the Action's activities:

- In-house software for 1D waveform modelling and analysis, for 3D scattering modelling in single-scattering approximation, and for pre-processing of air-coupled signals.
- Road Doctor software for data visualisation.
- 3D Examiner for processing and visualisation of 3D Radar results.

POLAND

National Institute of Telecommunications
State Research Institute
1 Szachowa street, 04-894 Warsaw, Poland

INSTYTUT ŁĄCZNOŚCI
PAŃSTWOWY INSTYTUT BADAWCZY
National Institute of Telecommunications

Marian Marciniak (MC Member)

Research activities within the COST Action TU1208:

- The National Institute of Telecommunications is a scientific & research center in telecommunications and information technologies. It focuses on the development of the national telecommunication network, and standardization issues.
- Electromagnetic wave propagation – theory and modelling
- Beam Propagation Method modelling.
- Waveguiding phenomena.

Available GPR equipment:

No available GPR equipment.

Other available equipment useful for the Action's activities:

RF network analyser, RF and millimeter wave laboratory instrumentation.

Software, useful for the Action's activities:

- In-house software for electromagnetic wave propagation analysis.
- Matlab.

Further TU1208 Partners in Poland:

Cracow University of Technology

Cracow, Poland

Tomisław Gołębiowski (MC S Member)
Lidia Żakowska

Kielce University of Technology

Kielce, Poland

Marian Marciniak (MC Member)

PORTUGAL

LNEC - National Laboratory for Civil Engineering
Av. do Brasil, 101 1700-066 Lisbon, Portugal

Simona Fontul (MC S Member)
Vânia Marecos

Research activities within the COST Action TU1208:

- Implementation of GPR methods to transport infrastructures evaluation.
- Monitoring and evaluation of functional and structural behaviour of transport infrastructures.

Available GPR equipment:

- GSSI air-coupled antennas, with central frequencies of 1.0 and 1.8 GHz.
- GSSI ground-coupled antennas, with central frequencies 500 and 900 MHz.
- SIR 20 and SIR 10H acquisition system.

Other available equipment useful for the Action's activities:

- Falling Weight Deflectometer (FWD), model PRI 2100, manufactured by Carl Bro.
- Light Falling Weight Deflectometer (LFWD).
- Grip-Tester, model MK1, manufactured by Findlay Irvine.
- Road Surface Profiler (RSP) model 5051 Mark III, manufactured by Dynatest.
- Equipment for core sampling from pavement layers.
- Laboratories for testing asphalt mixtures, concrete and soils.

Software, useful for the Action's activities:

- RoadDoctor Pro software, developed by Roadscanners.
- RADAN 6.5 software, developed by GSSI.

PORTUGAL

Polytechnic Institute of Leiria
School of Technology and Management
Department of Civil Engineering
Campus 2 – Morro do Lena- Alto Vieiro, Leiria, Portugal

Luisa Gonçalves (MC Member)

IPL
instituto politécnico de leiria

Research activities within the COST Action TU1208:

- Development of methodologies to automatically extract information from images.
- Applications of image processing techniques for structural assessment.
- Processing and modeling the uncertainty information.

Available GPR equipment:

No available GPR equipment.

Other available equipment useful for the Action's activities:

- Agilent Spectrum Analyser – 9kHz to 26.5GHz.
- Rohde &Schwarz Signal Source – 1 to 27 GHz.
- HP Signal Source – 1MHz to 3 GHz.
- Rohde &Schwarz Vector Network Analyser – 1MHz to 20 GHz.
- HP Infinium Digital Oscilloscope – 2GS/s – 500MHz.

Software, useful for the Action's activities:

Mathworks Matlab.

PORTUGAL

University of Minho
Department of Civil Engineering

Campus de Azurém, 4800-058 Guimarães, Portugal

Jorge Carvalho Pais (MC Member)
Francisco M. Carvalho P. Fernandes (MC S Member)

Research activities within the COST Action TU1208:

- Application of GPR to road pavement: diagnosis of road damages, pavement monitoring and planning of pavement management, authomatic detection and thickness measurement of pavements' layers, moisture content and density measurement in road subgrade, analysis of asphalt properties in flexible pavements, diagnosis of plastic material infiltration in road subgrade.
- Development of full-wave methods for the solution of electromagnetic forward-scattering problems by buried two-dimensional and three-dimensional structures.
- Development of advanced GPR data processing techniques.
- Development of numerical techniques for the localisation of buried cylindrical structures from GPR data.
- Synthesis, analysis and experimental characterisation of antennas.
- Measurement of the electromagnetic fields emitted by an equipment, for radiation protection.

Available GPR equipment:

RAMAC/GPR. Ground-coupled antennae 500 MHz - 1600 MHz centre frequencies.

Other available equipment useful for the Action's activities:

- Falling Weight Deflectometer (FWD), manufactured by Dynatest, Denmark.
- The Road Surface Profilometer (RSP), manufactured by Dynatest, Denmark.
- Laboratory equipment to produce and test asphalt mixtures.

Software, useful for the Action's activities:

Academic version of ReflexW.

ROMANIA

National Institute of R & D for Optoelectronics INOE 2000

Optoelectronic methods and techniques for cultural heritage rehabilitation and conservation department

Dragos Ene (MC Member)

Research activities within the COST Action TU1208:

- Application of GPR to archaeological sites (in land and underwater) and building foundation.
- Low altitude radar measurements for archaeological prospections.

Available GPR equipment:

RAMAC X3M from Mala GS, with available antennas: 100, 250, 500 and 800 MHz.

Other available equipment useful for the Action's activities:

- 3D laser scanner, operating distances: 1.5-22.5 meters.
- Laser Doppler Vibrometer.
- Mobile Laboratory ART4ART.

Software, useful for the Action's activities:

RadExplorer.

Further TU1208 Partners in Romania:

Ion Mincu University of Architecture and Urbanism

Bucharest, Romania

Sebastian Stan (MC Member)

RUSSIA

Bauman Moscow State Technical University

Remote Sensing Laboratory

5, 2 nd Baumanskaya str. 105005 Moscow

Sergey I. Ivashov (MC Observer)

Research activities within the COST Action TU1208:

- Designing of subsurface holographic radars.
- Applications of holographic subsurface radar in civil engineering, mainly to buildings surveying.
- NDT&E of construction materials that used in aerospace industry.
- Inspection of historical structures and artworks.
- Electromagnetic modelling and algorithms for subsurface holograms reconstruction.

Available GPR equipment:

Different types of subsurface holographic radars that are designed in the Laboratory.

Other available equipment useful for the Action's activities:

- Spectrum analyzer ROHDE&SCHWARZ FSP30. Spectrum analyzer C4-60.
- Signal Generator 8648D.
- Function generator ROHDE&SCHWARZ AM300.
- Oscilloscope Tektronix TDS 2022. Sampling oscilloscope C9-9. Oscilloscope C1-77, C1-99.
- Network analyzer P2-83.
- Power meters M3-90.
- Power supply NSBP-4, B5-47, B5-29. Power supply Mastech HY3005D-3, HY3020D-3.
- Signal Generator Metex MXG-9810A. Signal Generators G4-76A, G4-79, G4-80

Software, useful for the Action's activities:

NA.

Further TU1208 Partners in Russia:

Pushkov Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation (IZMIRAN), Russian Academy of Sciences

Moscow, Russia

Alexei Popov (MC Observer)
Vladimir Kopeikin (MC Observer)
Pavel Morozov (MC Observer)
Dmitry Edemskij (MC Observer)
Igor Prokopovich (MC Observer)

Further TU1208 Partners in Russia:

National University of Rwanda

Butare, Rwanda

Celestin Twizere (MC Observer)

SERBIA

University Of Novi Sad Faculty Of Technical Sciences Geospatial Technologies And Systems Center

Trg Dositeja Obradovića 6
21000 Novi Sad, Serbia

Miro Govedarica (MC Member)
Aleksandar Ristić (MC S Member)
Milan Vrtunski
Dušan Petrovački
Ivan Alargić

Research activities within the COST Action TU1208:

- more than 50 GPR projects related to civil engineering: 50% of utility detection in urban and suburban areas 25% geotechnical applications and 25% other applications
- Development of advanced GPR data processing techniques, shape-reconstruction and estimation of EM and physical properties from GPR data
- Combined applications with other technologies: laser scanning (TLS/ALS), Electromagnetic utility locator (EML), GNSS, ERT

Available GPR equipment:

- GSSI SIR 3000 GPR control unit with separated shielded antennas with central frequencies: 200, 400 and 900MHz

Other available equipment useful for the Action's activities:

- Acumen Data Bridge for synchronized work GPR and GPS
- Utility locator Radio Detection RD8000 with TDL-10 transmitter
- Leica P20 HDS terrestrial laser scanner
- Robotic total station Leica TCRP1201+

Software, useful for the Action's activities:

- GSSI software RADAN 6.6: Main module, 3D module, Interactive Interpretation I3D module
- Intergraph Geo Media and ERDAS Imagine and LPS
- Terra Solid
- Trimble Geomatics Office
- Leica Geo Office

Faculty of Electrical Engineering and Informatics, Technical University of Kosice

Košice, Slovak Republic

Jana Fortes (MC Member)
Dusan Kocur (MC Member)
Daniel Novak

SLOVENIA

University of Ljubljana Faculty of Natural Sciences and Engineering

Aškerčeva 12, SI-1000 Ljubljana, Slovenia

Andrej Gosar (MC Member)

Research activities within the COST Action TU1208:

- Application of Ground Penetrating Radar for investigation of active faults for seismic hazard studies.
- Application of Ground Penetrating Radar for investigation of cavities in karstic areas for karst science studies and for mitigation of geotechnical hazards.
- Application of Ground Penetrating Radar for investigation of landslides for mitigation of geotechnical hazards.
- Application of Ground Penetrating Radar for investigation of fractured zones in hydrogeological studies.
- Analysis and experimental characterisation of low-frequency Rough Terrain Antennas.
- Application of advanced GPR data processing techniques.

Available GPR equipment:

- Mala ProEx Control Unit.
- Mala Rough Terrain Antenna with 50 MHz centre frequency.

Other available equipment useful for the Action's activities:

- Differential GPS receiver Trimble.
- Portable GPS receiver Garmin.

Software, useful for the Action's activities:

- RadExplorer 1.4 software for GPR data processing and interpretation from Deco Geophysical Co.
- ReflexW 6.0 software for GPR data processing and interpretation from Sandmeier Software.
- ArcGIS software for Geographic Information System from ESRI.

SPAIN

Geofisica Aplicada Consultores, S.L.

Calle Ricardo León 33,
28250 Torrelodones, Madrid, Spain
Raúl Mínguez

Research activities within the COST Action TU1208:

- Railway applications of GPR: diagnosis of ballast, automatic detection of ballast fouling, thickness measurement, moisture, and ground settlement for preventive maintenance.
- Pavements applications of GPR: diagnosis of road damages, like stripping and layer debonding, rutting, cracking, moisture detection and voids, automatic detection and thickness measurement of pavements' layers, velocity determination by CMP analysis.
- The company has carried out more than 300 GPR projects related to civil engineering during the last 5 years: 30% of these projects concerned buried utility detection, 20% railways applications, 20% road applications, and 30% structure inspection (tunnels, bridges, buldings, dams), geotechnical applications and archeological surveys.

Available GPR equipment:

- 3D-Radar system, powered by a Geoscope Mark III, bandwidth from 100 to 3000 MHz.
- 3D-Radar Antenna V2429, array 2.4 m wide, with 29 channels spaced every 7.5 cm.
- 3D-Radar Antenna V0909, array 0.9 m wide, with 9 channels spaced every 7.5 cm.
- ProEx and 3XM Mala Geoscience.
- Mala Geoscience shlied antennas of 100 MHz, 250 MHz, 500 MHz, 800 MHz & 2300 MHz.

Other available equipment useful for the Action's activities:

- Resistivitymeter of DMT model RESECS, with 112 electrodes every 5.5 m.
- 24-channel Seismograph from DMT model SUMMIT Compact.
- Land streamer for MASW and REMI surveys.
- Utility location system, to detect and trace cable runs and pipe networks.
- Trimble DGPS model SPS 505 with Omnistar correction.
- Self developed system to synchronise GPR data, GPS positioning and IR pictures.

Software, useful for the Action's activities:

- 3D-Examiner from 3D-Radar.
- Routines to open and process 3D-radar data in Matlab.
- Reflex from Sandmaier.
- GroundVision from Mala Geosciene.

SPAIN

University of Vigo
applied geotechnologies research group

ETSE de Minas, Rua Maxwell
Campus Lagoas-Marcosende, 36310, Vigo (Spain)

Henrique Lorenzo (MC Member)
Pedro Arias
Xavier Nunez Nieto
Mercedes Solla (MC S Member)

Research activities within the COST Action TU1208:

- Development of a multi-sensor inspection vehicle: GPR, 3D laser scanners, RGB Cameras, Thermographic Cameras and laser profilometers.
- Application of GPR to road pavement.
- Characterisation of the GPR signal to detect burial pipes.
- Development of FDTD numerical modelling to improve the interpretation of GPR data.
- Application of GPR, 3D Laser Scanning, Close-range Photogrammetry and Thermography to structural engineering (bridges, tunnels) and to evaluation of cultural heritage.

Available GPR equipment:

- RAMAC GPR CU-II (Malå Geoscience). Ground-coupled antennae 50, 100, 200, 250, 500, 800 MHz and 1 GHz centre frequencies.
- ProEx GPR (Malå Geoscience) with optical and HF connections. Ground-coupled antennae 50, 100, 200, 250, 500, 800 MHz and 1 and 2.3 GHz centre frequencies.

Other available equipment useful for the Action's activities:

- Lynx Mobile Mapper manufactured by Optech Inc.
- Riegl LMS Z-390i 3D laser scanner manufactured by Riegl company.
- Digital LaserProf manufactured by the Greenwood company.
- Thermographic Camera GOBI 384 manyfactured by Xenics.
- Thermographic camera NEC TH9260 manufactured by NEC Corporation.

Software, useful for the Action's activities:

- 2D processing: ReflexW software.
- 3D processing: GPR-SLICE software.
- Modelling software for simulation: GPRSIM software.

SPAIN

UPC Politechnical University of Catalonia Research Group GIES

C/Jordi Girona 1-3, 08036Barcelona, Spain

Vega Pérez-Gracia (MC S Member)
José A. Canas
Oriol Caselles
Jaime Clapés
Lluis G. Pujades
Victor Salinas Naval
Sonia Santos Assunçao

Research activities within the COST Action TU1208:

- Use of GPR in the detection of damages and structural elements in historical buildings.
- Integrated geophysical studies.
- Development of advanced GPR data processing techniques.
- Applications of GPR in civil engineering.
- GPR applications in shallow geology.

Available GPR equipment:

- Mala ground-coupled antennae 250, 500, 800 and 1600 MHz centre frequencies. Mala RTA antenna 25 MHz.
- GSSI SIR-3000 system. GSSI 15-80 MHz and 100 MHz bistatic antennas. GSSI 200, 400, 500, 900, 1600 and 2000 MHz monostatic antennas.
- Geoscanner 100 MHz borehole monostatic antenna.

Other available equipment useful for the Action's activities:

- Optim 24 channels. LAN-XI type 3053 B&K module.
- 20 piezoelectric B&K accelerometers. 3 PCB piezotronics accelerometeres .
- Lennarz 3D/20 seismometer. OhmMapper . Capacity coupled resistivity meter.
- Video endoscopy AndroV55100. Termography camera NEC 100.

Software, useful for the Action's activities:

- GPR Slice (archaeometrics laboratory).
- Pulse LabShop.
- SeisOpt ReMi.
- OhmMapper.

Further TU1208 Partners in Spain:

Public University of Navarra

Pamplona, Spain

Belén Larumbe Gonzalo

Polytechnic University of Valencia

Valencia, Spain

Alfredo Garcia (MC Member)
Isabel-Rodriguez Abad
Joaquin Andreu
Luis Pallarés Rubio

.

Tyrens, Geotechnical Department

Stockholm, Sweden

Jaana Gustafsson

SWITZERLAND

MEET LTD

Via San Giorgio 7 P.O. Box

CH-6877 Coldrerio, Switzerland

Research activities within the COST Action TU1208:

- Non-destructive material analysis (microwave based).
- Microwave sensors.
- Non-contacting industrial moisture sensors.
- SAR equipment and antenna design + prototyping.
- Microwave survey methodology for assessing the liquefaction of alluvial materials.
- High-resolution spectral analysis algorithms.

Available GPR equipment:

- WavetesterTM, a microwave-based characterization system for moisture measurement in concrete and in other applications in the construction/mining/food industry

Other available equipment useful for the Action's activities:

- Spectrum analyzers.
- IFR A-8000.
- Antennas.

Software, useful for the Action's activities:

- High-Resolution Spectral Analysis software (proprietary)

SWITZERLAND

Rapperswil University of Applied Science
Institute for Construction and the Environment

Oberseestrasse 10, 8640 Rapperswil, Switzerland

Johannes Hugenschmidt (MC Member)

Research activities within the COST Action TU1208:

- Gound Penetrating Radar for non-destructive testing of transport infrastructure.
- Mobile acquisition systems for the inspection of roads, bridges and railway ballast.
- ATRAS – Automated system for the acquisition, processing and storage of GPR data. on whole road networks.
- Adaption of geophysical methods for non-destructive testing.
- GPR for the evaluation of material properties.

Available GPR equipment:

- GSSI SIR-20 GPR unit.
- Trimble model 5700 RTK system.
- 400 MHz. 900 MHz, 1500 MHz and 2600MHz ground coupled antennas.
- Horn antennas (air-launched).
- Purpose built 1500 MHz antennas for CMP measurements.
- REFLEXW software for data processing.

Other available equipment useful for the Action's activities:

NA.

Software, useful for the Action's activities:

NA.

SWITZERLAND

Scuola Universitaria professionale della Svizzera Italiana

Dipartimento tecnologie innovative
Dipartimento ambiente costruzione e design
Galleria 2, CH-6928 Manno, Switzerland

Luca Gamma (MC Member)
Samuel Poretti
Andrea Salvadè
Manuel Luescher

Research activities within the COST Action TU1208:

- Non-invasive inspection, material and object analysis, 2D/3D object reconstruction
- SAR prototyping for the monitoring of unstable avalanche zones.
- Microwave survey methodology for assessing the liquefaction of alluvial materials.
- Wireless surveys methodology for the detection of stresses in the precast segments.

Available GPR equipment:

NA.

Other available equipment useful for the Action's activities:

- Microwave-based characterisation system for moisture assessment in concrete.
- Agilent Technologies: PSG E8257E, 250 kHz – 40 GHz; 91150A, 20 MHz; N9310A, 9 MHz – 3 GHz; PSA E4446A, 3 Hz – 44 GHz; N5230A.
- Marconi Instruments 2031, 10 kHz - 2.7 GHz.
- Rohde & Schwarz SMIQ 04B, 300 kHz - 4.4 GHz.
- Anritsu S332B, 100 kHz – 3 GHz.
- Hewlett Packard 8596E, 8 kHz - 12.8 GHz.
- IFR 8000, 10 kHz - 2.5 GHz.
- Rohde & Schwarz FSH3, 100 kHz – 3 GHz.
- Tektronix YBT250, WCDMA/Code domain, 25 MHz - 2.5 GHz.
- Wide-band horn antennas: ATM Microwave, from 1 GHz up to 22 GHz.
- Log-periodic antenna from 850 MHz to 26.5 GHz, Rohde & Schwarz.

Software, useful for the Action's activities:

- 2.5D and 3D electromagnetic simulation software: Ansoft Designer and HFSS.

Further TU1208 Partners in Switzerland:

Smartec

Lugano Manno, Switzerland

Daniele Inaudi

Ankara University - Eartsciences Application And Research Center

Degol St., 06100 Tandoğan-Ankara, Turkey

Selma Kadioglu (MC Member)
Yusuf Kagan Kadioglu
Kiymet Deniz
Cuhmur Ozgan Kilic

Research activities within the COST Action TU1208:

- Development of advanced GPR data processing techniques.
- Applications of GPR and other non-destructive testing technologies in civil engineering, mainly in archaeological prospecting and cultural heritage diagnostics, building assessment and geological/geotechnical tasks.
- Shape-reconstruction and quantitative estimation of electromagnetic and physical properties from GPR data.
- Application of GPR to geological structures: determining and mapping faults, fractures, cavities, and geological boundaries.

Available GPR equipment:

- RAMAC CUII GPR system with 50 MHz unshielded, 100 MHz, 250 MHz, 500 MHz, 800 MHz and 1600 MHz shielded antennas.
- Geoscanners AB, Akula 9000 GPR main unit with CGB 100 MHz, GCB 200 MHz, CGB 400 MHz and CGB 1000 MHz antennas.

Other available equipment useful for the Action's activities:

- GeoScan Research UK. FM 256 Fluxgate Gradiometer.
- Geometrics OhmMapper.
- Hukseflux Thermal Sensor.
- FTN-01 Thermal Resistivity.
- BTSK/WTS Geophysical TEM Device.

Software, useful for the Action's activities:

- REFLEXW
- GPRSLICE
- GEOPLOT

TURKEY

Suleyman Demirel University
Department of Civil Engineering

Bati Campus 32260 Isparta, Turkey

Serdal Terzi (MC Member)
Mehmet Saltan (MC S Member)

Research activities within the COST Action TU1208:

- Application of GPR to road pavement: diagnosis of road damages, pavement monitoring and planning of pavement management, authomatic detection and thickness measurement of pavements' layers, moisture content and density measurement in road subgrade, analysis of asphalt properties in flexible pavements, diagnosis of plastic material infiltration in road subgrade.
- Development of full-wave methods for the solution of electromagnetic forward-scattering problems by buried two-dimensional and three-dimensional structures.
- Development of advanced GPR data processing techniques.
- Measurement of the electromagnetic fields emitted by GPR equipment, for radiation protection.

Available GPR equipment:

- IDS RIS 99. Ground-coupled antennae 600 MHz - 1600 MHz centre frequencies.

Other available equipment useful for the Action's activities:

- Light Falling Weight Deflectometer (LFWD) Dynatest 100, manufactered by Dynatest.
- Nuclear gauge.

Software, useful for the Action's activities:

- IDS Gred Software 6.0.

Further TU1208 Partners in Turkey:

Izmir University of Economics

Smirne, Turkey

Gokhan Kilic

UKRAINE

O.Ya. Usikov Institute for Radiophysics and Electronics of the National Academy of Sciences of Ukraine (IRE NASU)

Acad. Proskury St., 12
61085 Kharkiv, Ukraine

Gennadiy Pochanin (MC Observer)
Serey Masalov (MC Observer)

Research activities within the COST Action TU1208:

- Development of GPR (HW and SW): UWB impulse GPR, Gated Stepped Continues Frequency Wave GPR.
- Using GPR for the investigation of the road structure: measurement of layer thickness, detection of road damages, cavities/holes detection.
- Developing methodologies for the use of GPR equipment and data in the frame of searching for and mapping of subsurface utilities and for mineral deposits.
- Application of GPR to soil-related phenomena: soil characterization, distribution of soil moisture with depth, detection of compaction, pollution, buried objects.
- Using the phase structure of signals, antenna aperture synthesizing and polarization selection to recognize small buried objects.
- Integration of GPR and multi-receiver electromagnetic induction measurements.

Available GPR equipment:

- Radar Systems, Inc., Zond 10 (modified), dipole antennas 300 MHz centre frequencies.
- IRE NASU, "ODYAG", antenna system with high isolation between the transmitting and receiving modules, with working frequency range 0.8 - 1.6 GHz.
- Gated Stepped Continues Frequency Wave GPR (stepped frequency 25 – 450 MHz)

Other available equipment, useful for the Action's activities:

- Positioning system for radar tracking.
- Test site with buried pipes.

Software, useful for the Action's activities:

- GPR ProView, initial GPR data processing, (IRE NASU).
- Signal Processor, control of the radar equipment, (IRE NASU).
- GeoVizi, calculating of thickness of the layers of road structure using GPR data.

UNITED KINGDOM

The University of Edinburgh School of Engineering

Alexander Graham Bell Building, EH9 3JL
Edinburgh, UK

Antonis Giannopoulos (MC Member)
Craig Warren
Iraklis Giannakis

Research activities within the COST Action TU1208:

- Development of numerical modelling methodologies for the accurate simulation of GPR.
- Development of accurate models of GPR antennas.
- Study of GPR antenna radiation patterns using experimental and numerical approaches.
- Detailed and accurate simulation of antipersonnel landmines for the determination of clutter levels and facilitation of advanced signal processing methodologies for the delineation of targets and reduction of the false alarm rates.
- Application of GPR to structural elements containing Glass and Carbon fibre reinforcing elements.
- Application of GPR in archaeological investigations in the local community.
- Investigating novel GPR antenna designs to improve efficiency and reduce size.

Available GPR equipment:

- GSSI SIR-3000 with a range of antennas (100MHz to 15.GHz).
- MALA CUII with 1.6GHz and 1.2GHz antennas and XV11 monitor.
- MALA CUII with a 200MHz unshielded antennas.
- GSSI SIR 10H four channel system (not in regular use).

Other available equipment useful for the Action's activities:

- Access to High Performance Computer facilities.

Software, useful for the Action's activities:

- In-house developed numerical modelling software based on the finite-difference time-domain method (GprMax) for 2D and 3D GPR simualtions.
- FEKO for modelling of wire antennas,
- MATLAB for development of ideas and automation of complex model generation.

George Green Institute for Electromagnetics Research (GGIMER)

Faculty of Engineering The University of Nottingham University Park, Nottingham NG7 2RD, UK

Trevor Benson (MC S Member)

Research activities within the COST Action TU1208:

- Development of generic electromagnetic (EM) modelling and simulation techniques.
- Exploitation of modern high performance computing architectures.
- Stochastics in engineering design; improving electromagnetic resilience of systems.
- Electromagnetic compatibility measurements and testing.

Available GPR equipment:

- Wideband and multi-band antennas.
- Vector network analyser, probe kits, wideband digital oscilloscopes.
- RF cables, connectors, power splitter and combiners.

Other available equipment useful for the Action's activities:

- Mode stirred chamber: 200 MHz-40 GHz, Immunity and emissions testing EUT ~ 1 m3
- GTEM cell, ~DC – 20 GHz, Immunity and emissions testing, EUT ~ 30 cm3
- Anechoic chamber, <1GHz - >20GHz
- 3D near field scanner, measuring radiated emissions from complex components
- Dedicated computer cluster

Software, useful for the Action's activities:

- Centre of expertise in the transmission line modelling method (TLM).
- Simulation suite based on unstructured TLM (UTLM) interfaced with both commercial and bespoke industrial CAD processes.

UNITED KINGDOM

School of Engineering
University of Greenwich

Central Avenue,
Chatham Maritime Kent ME4 4TB, UK

Morteza Aboutalebi

Research activities within the COST Action TU1208:

- Applications of GPR in civil engineering.

Available GPR equipment:

- RIS Hi BrigHT – 2 GHz (array of eight horizontally polarised 2 GHz antennas), by IDS.
- TR DUAL-F HI MOD dual-frequency 200-600 MHz antenna, by IDS.
- HORN1000 1 GHz horn antenna, by IDS.
- TR HF High frequency, 2000 MHz antenna, by IDS.
- Groundvue 3 – 4 GHz antenna, by Utsi Electronics.
- Groundvue 3 – 1.5 GHz antenna, by Utsi Electronics.
- Groundvue 5 – 4 GHz antenna, by Utsi Electronics.
- Leica ScanStation P20 3D Laser Scanning System.
- Access to IBIS-S System (radar based deflection/deformation/settlement assessment system with interferometric capabilities), by IDS.
- Accelerometer sensors.
- Wireless Network Sensors System.

Other available equipment useful for the Action's activities:

NA.

Software, useful for the Action's activities:

NA.

UNITED KINGDOM

University of West London

Villiers House,
Ealing London,
W5 2NU, UK

Amir Morteza Alani (MC Member)

Research activities within the COST Action TU1208:

- Applications of GPR in assessment and monitoring of civil engineering structures including roads and highway pavements, bridges, tunnels and concrete buildings.
- Applications of GPR in archaeological and site investigation.
- Effective processing and interpretation of GPR data and development of new algorithms.
- Applications of other non-destructive and non-contact methods in assessment and monitoring of civil engineering structures including 3D Laser Scanner, IBIS-S sensor system, accelerometers and a wireless sensor network system.

Available GPR equipment:

NA.

Other available equipment useful for the Action's activities:

NA.

Software, useful for the Action's activities:

NA.

TRL Ltd. Infrastructure Division

Technology Development Group

Crowthorne House, Nine Mile Ride, Wokingham, RG40 3GA, UK

Adam Cook

Research activities within the COST Action TU1208:

- Accreditation, Quality Assurance and Support for the UK TRACS (TRAffic speed Assessment of Condition Surveys) Contract.
- Technical Support for Implementation of Traffic-speed Structural Condition Surveys .
- Traffic Speed LiDAR development and testing.
- Development of a Methodology for Measuring Road Pavement Thickness at Traffic Speed without Cores (Coreless GPR).
- Use of 'mixed in' radio-frequency tags to label road pavement materials and to read stored information at traffic-speed.
- Tomorrow's Road Infrastructure Monitoring and Management (TRIMM).

Available GPR equipment:

- Utsi Electronics GroundVue3 4-channel controller, GroundVue5c controller.
- Utsi Electronics dipolar antennas: 1x 400MHz with 3x receivers (single unit tx and rx and x2 additional rx units), 2x 1000MHz (seperate tx and rx units), 2x 1500MHz (seperate tx and rx units).
- Utsi Electronics: airlaunched antenna: 4GHz (GroundVue5).

Other available equipment useful for the Action's activities:

- Xcalibre Neptune pavement coring rigs
- Dynamic Cone Penetrometers and Dynatest Falling Weight Deflectometer
- WDM Deflectograph
- Pavement Test Facility: machine for accelerated trafficking of pavement sections.
- Traffic-speed survey vehicles with various measurement/data collection capabilities.

Software, useful for the Action's activities:

- Reflex for Windows: 2D-data-analysis and 3D-data-interpretation modules
- Surfer 11: contouring, gridding, and 3D surface mapping software
- ChartCrack: in house software for processing of pavement surface condition data collected by traffic-speed survey vehicles.

Further TU1208 Partners in United Kingdom:

The University of Manchester
Manchester, United Kingdom
Frank Podd

British Geological Survey
Edinburgh, United Kingdom
Seumas Campbell (MC S Member)

Atlas Geophysical Limited
Powys, United Kingdom
Alex Birtwisle

GM RADAR Solutions
London, United Kingdom
Christopher Stefas

Infrastructure Services – Mouchel
Glasgow
Michael Gordon

Queen Mary University of London
London
Lei Li

Keele University
Keele
Nigel Cassidy

USA

University of Mississippi
Center for Advanced Infrastructure Technology

Waheed Uddin (MC Observer)
Paul Goggans (MC Observer)

University of New Mexico

Mesbah Ahmed (MC Observer)

Washington State Department of Transportation

David R. Luhr (MC Observer)
Rafiqul A. Tarefder (MC Observer)
John P. Zaniewski (MC Observer)

University of Texas

A. T. Papagiannakis (MC Observer)

Hampton University

Devendra Parmar (MC Observer)

University of Texas

A. T. Papagiannakis (MC Observer)

COST - European Cooperation in Science and Technology is an intergovernmental framework aimed at facilitating the collaboration and networking of scientists and researchers at European level. It was established in 1971 by 19 member countries and currently includes 35 member countries across Europe, and Israel as a cooperating state.

COST funds pan-European, bottom-up networks of scientists and researchers across all science and technology fields. These networks, called 'COST Actions', promote international coordination of nationally-funded research. By fostering the networking of researchers at an international level, COST enables break-through scientific developments leading to new concepts and products, thereby contributing to strengthening Europe's research and innovation capacities.

COST's mission focuses in particular on: building capacity by connecting high quality scientific communities throughout Europe and worldwide; providing networking opportunities for early career investigators; increasing the impact of research on policy makers, regulatory bodies and national decision makers as well as the private sector.

Through its inclusiveness, COST supports the integration of research communities, leverages national research investments and addresses issues of global relevance. Every year thousands of European scientists benefit from being involved in COST Actions, allowing the pooling of national research funding to achieve common goals.

As a precursor of advanced multidisciplinary research, COST anticipates and complements the activities of EU Framework Programmes, constituting a "bridge" towards the scientific communities of emerging countries. In particular, COST Actions are also open to participation by non-European scientists coming from neighbour countries (for example Albania, Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Jordan, Lebanon, Libya, Moldova, Montenegro, Morocco, the Palestinian Authority, Russia, Syria, Tunisia and Ukraine) and from a number of international partner countries.

COST's budget for networking activities has traditionally been provided by successive EU RTD Framework Programmes. COST is currently executed by the European Science Foundation (ESF) through the COST Office on a mandate by the European Commission, and the framework is governed by a Committee of Senior Officials (CSO) representing all its 35 member countries.

More information about COST is available at www.cost.eu.

The scientific activities of the COST Action TU1208 are carried out within four Working Groups (WGs). The effectiveness of this scheme will be checked after the first year of activities and will eventually be modified, considering the actual number of active participants in each WG. The structure of each WG will always be kept as flexible as possible, in order to enable new participants to join. All the participants, when joining the Action, are invited to provide basic information on their experience, interests, and current research projects, as well as WGs and Projects preferences. Each participant can belong to two WGs and an arbitrary number of projects within the chosen WGs.

The four TU1208 WGs are: WG1 – Novel GPR instrumentation; WG2 – GPR surveying of pavements, bridges, tunnels and buildings; underground utility and void sensing; WG3 – EM methods for near-field scattering problems by buried structures and data processing techniques; WG4 – Different applications of GPR and other NDT technologies in civil engineering. The WG meetings constitute an opportunity to present activities, results and plans for the future. Between meetings, the WG members regularly interact.

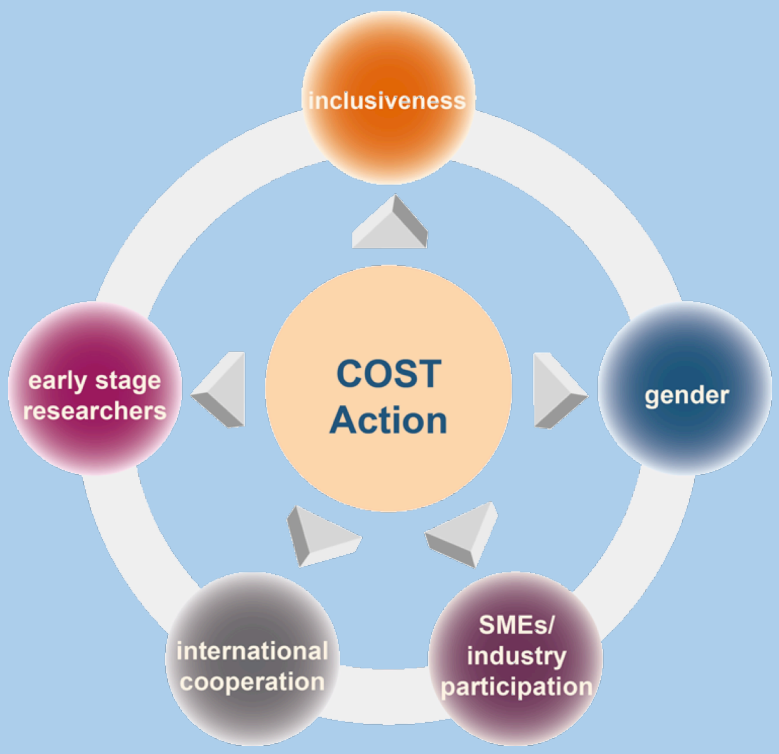
COST ACTION TU1208

CIVIL ENGINEERING APPLICATIONS OF GROUND PENETRATING RADAR

Booklet of Participants and Institutions (II Edition)

The COST Action TU1208 focuses on the exchange of scientific-technical knowledge and experience of Ground Penetrating Radar (GPR) techniques in civil engineering. This is a wide network involving participants from 28 COST Countries (Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, former Yugoslav Republic of Macedonia, Germany, Greece, Ireland, Latvia, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and United Kingdom), one COST Cooperating State (Israel), six COST Near Neighbour Countries (Albania, Armenia, Egypt, Jordan, Russia, and Ukraine), and five COST International Partner Countries (Australia, Hong Kong Special Administrative Region of the People's Republic of China, Philippines, Rwanda, and U.S.). The total number of Action's Members is 264 (239 from COST Member Countries, 13 from NNCs and 12 from IPCs). The total number of Institutions is 132 (114 from COST Member Countries, 8 from NNCs and 10 from IPCs). University researchers, software developers, civil and electronic engineers, archaeologists, geophysicists, non-destructive testing equipment designers and manufacturers, end users from private companies, and stakeholders from public agencies are actively involved in the Action research projects and initiatives.

This booklet includes two parts. The first part is devoted to presenting the Action's Members. For each person, the full contact details are reported, a biographical sketch, information about her/his experience on the Action's topics, participation to other COST Action and role in TU1208. The second part of the volume is devoted to presenting the Institutions involved in TU1208. For each institute, information is reported concerning the research activities carried out on the Action's topics, the available GPR equipment, as well as further available equipment and software useful for the Action's activities.



www.GPRadar.eu

www.cost.eu/domains_actions/tud/Actions/TU1208