

Samuel Bignardi

Updated March 3, 2019

Me at glance:

In general, I conduct research in the field of Geophysical methods and non-invasive investigation methods. In particular, I have worked on developing the theory and on the implementation of computational algorithms to analyze, simulate and invert various kind of dataset. The main focus of this effort was devoted to seismic signals (i.e. acoustic/elastic propagation) in solids and electromagnetic signals propagated both in air and solids. As such, I have applied and am acquainted with many geophysical techniques. Additionally, I performed research in Remote sensing (Synthetic aperture radar, SAR), Medical Imaging, and machine learning. I am passionate of scientific algorithm engineering, starting from the mathematical development to implementation.

Professional skills

Applied Physics, Applied Geophysics

Signal analysis, Modeling, Inversion, Algorithms development and implementation

Geophysical methods: HVSR, SASW, MASW, ReMi, ESAC, ERT, GPR, P-wave tomography, Seismic Reflection, FWI

Programming: C/C++, Matlab, Python, Fortran, Basic, Tcl/Tk, LabVIEW, Bash

Image processing: Active contours, Level set method
Machine Learning

Languages Italian, English

Scopus: [55152395400](#)

ResearcherID: [M-3147-2015](#)

ORCID: [0000-0002-5970-6265](#)

<https://www.samuelbignardi.com/>

<https://www.ece.gatech.edu/faculty-staff-directory/samuel-bignardi>

Education

Ph.D.	in Earth Sciences, 2011. <i>University of Ferrara (Italy)</i> Title: Complete waveform inversion approach to seismic surface waves and adjoint active surfaces Evaluation: Excellent
M. Sc.	in Physics, 2006. <i>University of Ferrara (Italy)</i> Evaluation: 105/110

Research experience

2017	May 2017 - Present, Research Engineer II Georgia Institute of Technology, USA. School of Electrical and Computer Engineering (ECE) Modeling and inversion of radar data (SAR, GPR) through the study of the full waveform and the use of active surfaces October 2016 - April 2017, Postdoctoral Researcher University of Ferrara (Italy) Development of numerical methods and algorithms for the two- and three-dimensional modeling and inversion of surface waves
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- August 2016 – September, 2016, **Research contract**
University of Ferrara (Italy) - Ferrara Research consortium
Construction of subsurface models and ground shaking scenarios in the northern area of Ferrara city (Italy)
- 2014 September 2014 – July 2016, **Postdoctoral Researcher**
University of Ferrara, Dept. of Physics and Earth Sciences (Italy)
Development of numerical methods and algorithms for the two- and three-dimensional modeling and inversion of surface waves
- 2014 March 2014 – August 2014, **Postdoctoral researcher**
Georgia Institute of Technology Joint: School of Electrical and Computer Engineering & School of Civil and Environmental Engineering
Modeling and inversion of elastic signals for anomaly segmentation through the study of the full waveform and the use of active surfaces
- 2011 February 2011 – February 2014, **Postdoctoral Researcher**
University of Ferrara, Dept. of Physics and Earth Sciences (Italy)
Development of numerical methods and algorithms for the two- and three-dimensional modeling and inversion of surface waves
- 2010 January 2010 - July 2010,
Visiting Ph.D. Student at Georgia Institute of Technology. Georgia, School of Civil and Environmental Engineering (CEE), USA.
- 2009 March 2009 - August 2009,
Visiting Ph.D. Student at Georgia Institute of Technology. Georgia, School of Civil and Environmental Engineering (CEE), USA.
- 2007 May 2007 – October 2007, **Research grant**
University of Ferrara, Joint position: Department of Earth Sciences and Department of computer Sciences (Italy)
Development of elaboration algorithms of electric and acoustic tomography for the Hydro-Geology

Honors and Awards

- 2016 Invited speaker at the 29th Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP 2016). March 20-24, Denver CO, USA
Section: The best of the Near Surface 2015
- 2015 Best paper at Near Surface Geoscience 2015, Turin, Italy

Publications

Patents

- 2014 **S. Bignardi**, F. Fischangher, D. Gualerzi, G. Morelli, A. Occhi, M. Occhi, M. Russo, G. Santarato.
Method for the evaluation of the mechanical properties of soil. File n. PD2014A000001 (IT).

Books

- 2015 G. Santarato, N. Abu Zeid, **S. Bignardi**. Lectures of applied Geophysics (In Italian). ISBN: 978-88-6292-640-9.

Journal articles (✉ Corresponding Author)

- 2019 ✉ **Structural Health Monitoring**. [Submitted]
M.R. Gallipoli, T.A. Stabile, G. Massolino, M. Mucciarelli, N. Abu Zeid, L. Chiauzzi, **S. Bignardi**. *Structural health monitoring of the Ferrara University building by ambient vibration tests and earthquake recordings before the 2012 Emilia (Italy) earthquake, after the damage and after the damage repair intervention*.
- 2019 ✉ **Pure and Applied Geophysics**. [In press]
A. Mantovani, N. Abu Zeid, **S. Bignardi**, G. Tarabusi, G. Santarato, R. Caputo. *Seismic noise-based strategies for emphasizing the recent tectonic activity of blind thrusts: the case of the Ferrara Arc, Northern Italy*.
- 2019 **Artificial Intelligence in Medicine**, Vol. 94, pp. 67-78.
A. Comelli, A. Stefano, **S. Bignardi**, G. Russo, M. G. Sabini, M. Ippolito, S. Barone, A. Yezzi. *Active Contour Algorithm with Discriminant Analysis for Delineating Tumors in Positron Emission Tomography*. DOI:10.1016/j.artmed.2019.01.002.
- 2019 **Engineering Applications of Artificial Intelligence**, Vol. 81, pp. 133-144.
A. Comelli, A. Stefano, G. Russo, **S. Bignardi**, M. G. Sabini, G. Petrucci, M. Ippolito, A. Yezzi. *K-Nearest Neighbor driving Active Contours to Delineate Biological Tumor Volumes*. DOI:10.1016/j.engappai.2019.02.005.
- 2018 **Computers in Biology and Medicine**, Vol. 102, pp. 1-15.
A. Comelli, A. Stefano, G. Russo, M. G. Sabini, M. Ippolito, **S. Bignardi**, G. Petrucci, A. Yezzi. *A Smart and Operator Independent System to delineate the Biological Tumor Volume*. DOI:10.1016/j.combiomed.2018.09.002.
- 2018 ✉ **Computers & Geosciences**, Vol. 120, pp. 10-20.
S. Bignardi, A. Yezzi, S. Fiussello, A. Comelli. *OpenHVSR - Processing Toolkit: Enhanced HVSR processing of distributed microtremor measurements and spatial variation of their informative content*. DOI:10.1016/j.cageo.2018.07.006.
- 2017 ✉ **Journal of Applied Geophysics**, Vol. 145C, pp. 28-38.
S. Bignardi *The uncertainty of estimating the thickness of soft sediments with the HVSR method: A computational point of view on weak lateral variations*. DOI:10.1016/j.jappgeo.2017.07.017.
- 2017 **Archaeological Prospection**
N. Abu Zeid, E. Corradini, **S. Bignardi**, V. Nizzo, G. Santarato. *The passive seismic technique "HVSR" as a reconnaissance tool for mapping paleo-soils: the case of the Pilastrri archaeological site, Northern Italy*. DOI:10.1002/arp.1568.
- 2016 **Forma Urbis**. (Italian Journal)
V. Nizzo, N. Abu Zeid, S. Bergamini, **S. Bignardi**, M. Boschetti, E. Corradini, L. Dal Fiume, R. Guerzoni, C. Milanese, G. Santarato, S. Tassi. *Archeologia e Società*.
- 2016 **Journal of Applied Geophysics**, Vol. 133, 16-24.
V. Y. Hallbauer-Zadorozhnaya, G. Santarato, N. Abu Zeid, **S. Bignardi**. *A non-linear induced polarization effect on transient electromagnetic soundings*. DOI:10.1016/j.jappgeo.2016.07.014.
- 2016 ✉ **Computers & Geosciences**, Vol. 93, pp. 103-113.
S. Bignardi, N. Abu Zeid, A. Mantovani. *OpenHVSR: Imaging the subsurface 2D/3D elastic properties through multiple HVSR modeling and inversion*. DOI:10.1016/j.cageo.2016.05.009.
- 2014 **Annals of the University of Ferrara**, Section: Earth Sciences, Vol. 2(1), pp. 1-11.
N. Abu Zeid, A. Afattato, L. Baradello, **S. Bignardi**, D. Nieto Yabar, G. Santarato. *High resolution shallow geophysical methods for the investigation of the liquefaction phenomena: case study of the ML 5.9 May 20th, 2012 Emilia earthquake (Italy)*.

- 2013 ☒ | **Journal of engineering mechanics**, Vol. 139 (9), pp. 1158-1165.
S. Bignardi, F. Fedele, G. Santarato, A. J. Yezzi, G. J. Rix. *Surface waves in laterally heterogeneous media*. DOI:10.1061/(ASCE)EM.1943-7889.0000566.
- 2012 | **Annals of Geophysics**, Vol. 55, pp. 713-716.
 N. Abu Zeid, **S. Bignardi**, R. Caputo, G. Santarato, M. Stefani. *Electrical Resistivity Tomography investigation on co-seismic liquefaction and fracturing at San Carlo, Ferrara Province, Italy*. DOI:10.4401/ag-6149.
- 2012 ☒ | **Bulletin of the Seismological Society of America**, Vol. 102, pp. 802-811.
S. Bignardi, F. Fedele, A. Yezzi, G. Rix, G. Santarato. *Geometric Seismic-Wave Inversion by the Boundary Element Method*. DOI:10.1785/0120110091.
- 2010 | **Geophysical Research Abstracts**, Vol. 12, pp. 13138-13138.
 M. Stefani, **S. Bignardi**, R. Caputo, L. Minarelli, N. Abu Zeid, G. Santarato. *Late Quaternary activity along the Ferrara thrust inferred from stratigraphic architecture and geophysical surveys*.

Conferences (☉ Presenter)

- 2019 | **MIUA** (Submitted): 23rd Conference on Medical Image Understanding and Analysis. July 24-26, Liverpool, UK.
 A. Comelli, A. Stefano, S. Bignardi, C. Coronello, G. Russo, M. G. Sabini, M. Ippolito, A. Yezzi. *Tissue Classification to Support Local Active Delineation of Brain Tumors*
- 2019 ☉ | **SAGEEP 2019** (Accepted): 32nd Symposium on the Application of Geophysics to Engineering and Environmental Problems. Portland, Oregon, USA.
S. Bignardi, A. Mantovani, N. Abu Zeid, R. Caputo, G., A. Yezzi. *Emphasizing the recent tectonic activity of blind thrusts using natural seismic noise: the case of the Ferrara Arc*.
- 2019 ☉ | **SAGEEP 2019** (Accepted): 32nd Symposium on the Application of Geophysics to Engineering and Environmental Problems. March 17-21 Portland, Oregon, USA.
S. Bignardi, A. Mantovani, D. Rapti, S. Valkaniotis, R. Caputo, A. Yezzi. *Mapping and investigating directional effects through analysis of microtremors: the case of palaeo-Piniada valley, central Greece*.
- 2018 ☉ | **AGU Fall meeting**. Section: A tour of open-source software packages for the geosciences. December 10-14, Washington D.C., USA.
S. Bignardi, A. J. Yezzi. *OpenHVSr: Processing Toolkit and Inversion; Two Computer Programs engineered for the complete workflow of the Horizontal-to-Vertical Spectral Ratio (HVSr) Method and for the Investigation of Lateral Variation of the Informative Content of Data*.
- 2018 | **16ECEE**, 16th European Conference on Earthquake Engineering.
 M. R. Gallipoli, T. A. Stabile, G. Massolino, N. Abu Zeid, L. Chiauzzi, **S. Bignardi**, A. Rebez, M. Mucciarelli. *Ambient Vibration Tests on a Building Before and After the 2012 Emilia (Italy) Earthquake, and After Seismic Retrofitting*.
- 2018 ☉ | **SAGEEP 2018**: 31st Symposium on the Application of Geophysics to Engineering and Environmental Problems, March 25-29, Nashville, Tennessee, USA.
S. Bignardi, A. Yezzi, S. Fiussello. *Free and improved computer codes for HVSr processing and inversions*.
- 2018 | Annals online of the University of Ferrara, Museologic Scientific and Naturalistic section. Vol. 13, p. 50-52
 N. Abu Zeid, M. Obradović, **S. Bignardi**, M. Bolognesi, A. Furini, P. Russo, G. Santarato, M. Piresani. *Deep into a Paleolithic archive. Results from an integrated 3D geophysical and topographic survey at Fumane Cave. (Italy)*

- 2017 © **SEG** Technical Program Expanded Abstracts 2017: pp. 5119-5124.
S. Bignardi, N. Abu Zeid, E. Corradini, G. Santarato. *The HVSR technique from array data, speeding up mapping of paleo-surfaces and buried remains. The case of the Bronze-Age site of Pilastrri (Italy)*. DOI: 10.1190/segam2017-17746745.1
- 2017 © **SEG** Technical Program Expanded Abstracts 2017: pp. 5125-5129.
 N. Abu Zeid, **S. Bignardi**, G. Santarato, M. Peresani. *Exploring the paleolithic cave of Fumane (Italy): Geophysical methods as planning tool for archaeology*. DOI: 10.1190/segam2017-17729320.1
- 2017 **EGU**, Proceedings from the 19th General Assembly, 23-28 April, Vienna, Austria, pp.19172
 N. Abu Zeid, L. Dall'Olio, **S. Bignardi**, G. Santarato. *Past, present and future improvements of the efficiency of the local seismic network of the geothermal reservoir of Casaglia, Ferrara (North Italy)*.
- 2016 **EAGE**, Technical Program of the 22nd European Meeting of Environmental and Engineering Geophysics; Near Surface Geoscience 2016, 4-8 September, Barcelona, Spain.
 N. Abu Zeid, E. Corradini, **S. Bignardi**, N. Morandi, V. Nizzo, G. Santarato. *Unusual Geophysical Techniques in Archaeology – HVSR and a case history*.
- 2015 GNGTS. Proceedings of the 34th national conference, pp. 114-120, National Institute of Oceanography and Experimental Geophysics, November 17-19, Trieste, Italy.
 A. Mantovani, N. Abu Zeid, **S. Bignardi**, G. Santarato. *A geophysical transect across the central sector of the Ferrara arc: passive seismic investigations - part II*. DOI:10.13140/RG.2.1.3213.7687
- 2015 © GNGTS Proceedings of the 34th national conference of the GNGTS. p. 82-88, National Institute of Oceanography and Experimental Geophysics, November 17-19, Trieste (IT).
S. Bignardi, N. Abu Zeid, G. Santarato. *Direct interpretation of surface waves for 2-D and 3-D subsurface imaging*. ISBN: 978-88-940442-7-0, DOI: 10.13140/RG.2.1.1182.1527
- 2015 © **SEG** Technical Program Expanded Abstracts 2015: pp. 2218-2223.
S. Bignardi, N. Abu Zeid, G. Santarato. *Direct interpretation of phase lags of MASW data: An example for evaluation of jet grouting for soil stiffening enhancement against soil liquefaction*. DOI: 10.1190/segam2015-5925998.1.
- 2015 © **EAGE**, Near Surface Geoscience 2015 - 21st European Meeting of Environmental and Engineering Geophysics. September 6-10, Turin.
S. Bignardi, N. Abu Zeid, M. D'Attoli, G. Morelli, M. Occhi, M. Russo, G. Santarato. *Near foundation soil stiffening evaluation after resins injection by a novel 3D interpretation of surface waves data* DOI: 10.3997/2214-4609.201413799.
- 2015 **EAGE**, Near Surface Geoscience 2015 - 21st European Meeting of Environmental and Engineering Geophysics. September 6-10, Turin.
 M. Obradović, N. Abu Zeid, **S. Bignardi**, M. Bolognesi, P. Russo M. Peresani, G. Santarato. *High Resolution Geophysical and Topographical Surveys for the Characterization of Fumane Cave Pre-historic Site, Italy*. DOI: 10.3997/2214-4609.201413676.
- 2015 **EAGE**, Near Surface Geoscience 2015 - 21st European Meeting of Environmental and Engineering Geophysics. September 6-10, Turin.
 V. Zadorozhnaya, N. Abu Zeid, **S. Bignardi**, L. Maré, R. Mantsa e G. Santarato. *Observed Linear and Non-linear IP Effects - A Summary of Joint Italy-South Africa Bilateral Projects 2007-2014*. DOI: 10.3997/2214-4609.201413778.
- 2014 GNGTS-2014, Proceedings of the 33th National Convention National Group Solid Earth Geophysics.
 N. Abu Zeid, **S. Bignardi**, R. Caputo, A. Mantovani, G. Tarabusi, G. Santarato. *Shear-wave velocity profiles across the Ferrara arc: a contribution for assessing the recent activity of blind tectonic structures*. ISBN 978-88-940442-2-5.

- 2014 GNGTS-2014, Proceedings of the 33th National Convention National Group Solid Earth Geophysics, Vol. 3; p. 158-165. November 25-27, Bologna, Italy.
V. Hallbauer-Zadorozhnaya, G. Santarato, N. Abu Zeid, **S. Bignardi**. *Membrane polarization by constrictivity of pores: its effects on DC and TEM geo-electromagnetic measurements*. ISBN: 978-88-940442-3-2.
- 2014 © **EAGE**, 76th Conference & Exhibition, Experience the Energy, Amsterdam, Netherlands; June 2014.
S. Bignardi, G. Santarato, N. Abu Zeid. *Thickness Variations in Layered Subsurface Models - Effects on Simulated MASW*.
- 2014 3rd International Workshop on Induced Polarization. April 6-9, Ile d'Oléron, France.
V. Zadorozhnaya, N. Abu Zeid, G. Santarato, **S. Bignardi**. *New shape of TEM: membrane polarization, mechanism and possible interpretation*.
- 2013 GNGTS 2013, Proceedings of the 32th National Convention National Group Solid Earth Geophysics, Vol. 2; p. 167-172. November 19-21, Trieste, Italy.
N. Abu Zeid, F. Albertin, **S. Bignardi**, G. Santarato. *Preliminary HVSR analysis in the historical center of Ferrara, North Italy* ISBN/ISSN: 9788890210174.
- 2013 Conference at the "Polo Scientifico-Tecnologico", July 14, University of Ferrara, p. 1-1. (In Italian).
N. Abu-Zeid, F. Albertin, **S. Bignardi**, L. dall'Olio, G. Santarato. *Subsurface geophysical reconstruction of the Casaglia urban area*.
- 2013 Conference at the "Polo Scientifico-Tecnologico", July 14, University of Ferrara, p. 1-1. (In Italian)
N. Abu-Zeid, F. Albertin, **S. Bignardi**, G. Santarato, A. Zecchi. *Subsurface geophysical reconstruction of the northern Ferrara*.
- 2012 AGE, October 10-12, Iglesias, Cagliari, University of Cagliari. Vol. 1, pp. 1-62010.
N. Abu Zeid, **S. Bignardi**, G. Santarato, R. Caputo. *Geophysical characterization of co-seismic fractures due to liquefaction: case study following the ml 5.9 magnitude earthquake that hit the Emilia on May20, 2012*.
- 2012 © AIAR, Proceedings of the 7th Congress of the Italian Association of Archaeometry. p. 702-713. February 22-24, Bologna.
S. Bignardi, N. Abu Zeid, G. Santarato. *Non-destructive investigations for characterization of historical walls: the case of the left wall of the 1500a. Cloister of the Certosa of Bologna*. ISBN: 9788855531665.
- 2012 © GNGTS, Proceedings of the 31th National Conference. Section 3: Applied Geophysics. pp. 11-17, National Institute of Oceanography and Experimental Geophysics. November 20-22, Potenza (Italy).
S. Bignardi, N. Abu Zeid, G. Santarato. *Lateral heterogeneity effects on Rayleigh wave dispersion: Investigation on numerically simulated MASW frameworks*. ISBN/ISSN 9788890210136.
- 2012 © **Geo-Congress**, Proceedings. Oakland, California, March 25-29, American Society of Civil Engineers. Vol. 225, pp. 2796-2805
Bignardi, F. Fedele, A. J. Yezzi, G. J. Rix, G. Santarato. *Two-dimensional Seismic Wave Modeling and Inversion by the Boundary Element Method*. ISBN/ISSN:9780784412121.
- 2011 © GNGTS 2011, Proceedings of the 30th National Convention National Group Solid Earth Geophysics, pp. 466-469. November 14-17. Trieste (Italy).
S. Bignardi, F. Fedele, G. Santarato. *Two-Dimensional seismic wave modeling and inversion using the boundary element method*.
- 2010 **EGU**, General assembly. Geophysical Research Abstracts. Vol. 12, p. 13138-13138. May 2-7. Vienna.
S. Bignardi, R. Caputo, L. Minarelli, N. Abu-Zeid, G. Santarato. *Late Quaternary activity along the Ferrara thrust inferred from stratigraphic architecture and geophysical surveys*. ISSN 1607-7962.

- 2009 | Epitome. September 9-11, Rimini, Italian Federation of Earth Sciences. Vol. 3, p. 176-176. M. Stefani, **S. Bignardi**, R. Caputo, L. Minarelli, N. Abu Zeid, G. Santarato. *Late Quaternary activity in the Ferrara area inferred from stratigraphic architecture.*
- 2009 | Abstracts Vol. 1, p. 64. October 19-21, Roma (Italy). R. Caputo, M. Stefani, **S. Bignardi**, L. Minarelli, N. Abu Zeid, G. Santarato. *Late Quaternary tectonic activity in the Ferrara area inferred from stratigraphic architecture.*

Seminars

- 2019 | January 25: **(Invited speaker) Georgia Institute of Technology**, School of Earth and Atmospheric Sciences; Geophysics and Planetary seminars. *An overview of geophysical methods for the near surface characterization, with special focus on active and passive surface waves in presence of lateral heterogeneity.*
- 2018 | December 5: **(Invited speaker) Western University**, Department of Earth Sciences, London, CA. *Integrated geophysical methods as low cost and efficient investigation tool at different scales.*
- 2018 | November 29: **(Invited speaker) Ottawa-Carleton Geoscience Center (OCGC) in conjunction with the Geological Survey of Canada's Logan Club (NRCAN)**, Ottawa, CA. Geoscience Seminar Series. *Integrated geophysical methods as low cost and efficient investigation tool at different scales (Part 1). The Horizontal to Vertical Spectral Ratio technique (HVSR): status of the art, limitations, exploring its true potential (Part 2).*
- 2017 | September 29: **(Invited speaker) Georgia institute of Technology, Atlanta, USA**. CSIP/CeGP Seminar series. *Non-invasive investigation techniques: The contribution of geophysics to engineering.*
- 2009 | September 9: Geotechnical Seminars at the Georgia institute of Technology, Atlanta, USA. *Surface Wave Dispersion in Laterally Heterogeneous Media.*

Teaching

- 2017:** Professional upgrading course: Beyond the Vs30 for seismic microzonation -the combined use of active and passive seismic. Organized by IND.A.G.O. snc. (Italy)
- 2016-2017:** University level: Support to the class activity for the course of Applied Geophysics (GEO/11). Theory and field application of geophysical methods. University of Ferrara (Italy).
- 2015-2016:** University level: Support to the class activity for the course of Applied Geophysics (GEO/11). Theory and field application of geophysical methods. University of Ferrara (Italy).
- 2013-2014** University level: Support to the class activity for the course of Applied Geophysics (GEO/11). Theory and field application of geophysical methods. University of Ferrara (Italy).
- 2012-2013:** University level: Support to the class activity for the course of Applied Geophysics (GEO/11). Theory and field application of geophysical methods. University of Ferrara (Italy).
- 2007:** Teacher of Math, High School level. "Istituto di Istruzione Superiore C.Colombo", Via S. Francesco 33, 45011 Adria (RO), Italy.

Students Mentoring

2017 ** Elena Oratelli (Master Degree)

Contributing to the seismic subsurface characterization in the urban area of Ferrara (Italy) (Italian)

Master Degree program in Geological Sciences, Georesources and Territory. University of Ferrara (Italy)

2016 ** Annalisa Ferraccioli (Master Degree)

The contribution of innovating geophysical methodologies for the reconstruction of the geological subsurface model for seismic induced liquefaction risk assessment: the case of the Crevalcore town hall (Bologna, Italy) (In Italian)

Master Degree program in Geological Sciences, University of Ferrara (Italy)

2015 Angelo Tesoriero (Master Degree)

The Ferrara-Casaglia Ridge: seismo-stratigraphic interpretation and reconstruction of the 3D subsurface model in the structural framework of the north-eastern Ferrara arc (In Italian)

Master Degree program in Geology, University of Ferrara (Italy), in collaboration with ENI

2015 Marija Obradović (Ph. D. Candidate)

Interdisciplinary three-dimensional investigation of the Early Prehistoric deposits of Fumane Cave (Verona, Italy)

Doctoral program in sciences and technologies for archaeology and cultural heritage. University of Ferrara (Italy)

2015 Erica Corradini (Master Degree)

New, direct and indirect insight on the "terramare" archaeological site of Pilastrì (Bondeno, Ferrara, Italy) (In Italian)

Master Degree program in quaternary, prehistory and archaeology. University of Ferrara (Italy)

2011 Maria Paola Marinelli (Bachelor Degree)

Electric resistivity tomography on the left wall of the 1500 c.a. Cloister of the historical cemetery of Bologna (In Italian)

Bachelor Degree program in technologies for cultural heritage, University of Ferrara (Italy)

2011 Novella Coviello (Bachelor Degree)

Acoustic and GPR investigations on the left wall of the 1500 c.a. Cloister of the historical cemetery of Bologna (In Italian)

Bachelor Degree program in technologies for cultural heritage, University of Ferrara (Italy)

Participation in Research projects

(USA) W911NF-18-1-0281, Army Research Office (ARO), Extending Accelerated Optimization into the PDE Framework, (Included as Senior Personnel)

(USA) NSF-2106 DHO. Geometric, Variational Algorithms for Radiometric-Based Shape Reconstruction.

(ITALY) 2015-2016, Italian Government sponsored Project for Smart Cities and Communities: CLARA - CLOUD platform and smart underground imaging for natural Risk Assessment.

(ITALY – SOUTH AFRICA) 2007-2014, Joint International Project, Italia-South Africa: Estimating key hydrological properties through acquisition and modeling of electrical parameters.

(ITALY) INGV-DPC 2013-2014, Project S1: Base-knowledge improvement for assessing the seismic potential of Italy.

(ITALY) INGV-DPC 2012-2013, Project S1: Base-knowledge improvement for assessing the seismic potential of Italy.

Scientific software created

OpenHVSR (Matlab) **Published as open source**. Modeling and inversion of microtremor spectral ratio curves for 2D and 3D subsurface elastic parameters evaluation

OpenHVSR-Processing-Toolkit (Matlab) **Published as open source**. Signal processing, and visualization, toolkit for microtremor, to investigate spatial correlations of the data content

DIPL (Matlab) Direct interpretation of surface waves propagation phase lags for (2D and 3D) subsurface characterization of Ryleigh waves velocity.

S3D / S3Di (C++ and QT) Spectral finite element method-based software for the Full wavefield simulation and Full waveform inversion of waves in solids. Propagation in 2D and 3D mesh with high degree of geometrical complexity and heterogeneous materials is included.

OpenSW (Matlab) Laterally constrained Inversion of surface waves dispersion curves (MASW, ReMi) for reconstructing 2D/3D subsurface models.

B2D (Matlab, and C++) Boundary element-based modeling and Full waveform inversion of elastic and acoustic wave propagation. Inversion implemented for 2D layered models.

PTOMO (Matlab) Huygens principle-based P waves first arrival simulation P-waves simulator. Tomographic inversion under development. Propagation in 3D mesh with high degree of geometrical complexity is included.

OpenSPlaneTEM (Matlab) Modeling and inversion of Transient Electromagnetic (TEM) curves for 2D and 3D characterization of the subsurface electro-magnetic parameters.

Reviewer activity

Journal of Applied Geophysics

Journal of Archaeological Science: Reports

Journal of Geophysics and Engineering

Near Surface Geophysics

Seismological Research Letters

Surveys in Geophysics

Memberships

AGU - American Geophysical Union

SEG - Society of Exploration Geophysicists

EEGS - Environmental and Engineering Geophysical Society

CRUST-Interuniversity Center for 3D Seismotectonics with territorial applications (Italy)

Contacts

Email

bgnsml@unife.it

sedysen@gmail.com

sbignardi3@mail.gatech.edu

☎ +1 (404) 704 5404

☎ +39 (349) 659 5142