PERSONAL INFORMATION   Margherita Maraschini

TITLE

Data Scientist
Research mathematician
Scientific programmer

WORK EXPERIENCE

2021-2022   Machine learning researcher

University of Venice "Ca' Foscari" (research grant) . The role consists in the developing of machine Learning algorithms in Python to estimate climate change induced risks in the costal area of Veneto Region.

2010-2021   Research data scientist

Shearwater Geoservices (formerly Dolphin Geophysical) , CGG, Fugro Seismic Imaging
01/10/2010 – 04/10/2021
London, United Kingdom
The roles include:

- perform research to improve company seismic data processing portfolio for Oil and Gas exploration,

- design and develop new software to analyze, denoise and interpolate seismic data. The software is implemented in C++ or Python for in house data processing system and for commercial software REVEAL,

- coordinate R&D projects,

- tutoring interns and new starters,

- writing and presenting scientific papers.

Main projects on data filtering :

- Non Local Mean: edge preserving Fortran algorithm to remove random noise from 2D and 3D images. The tool was widely appreciated by clients for the quality of the results.

- 3D Rank Reduction filter : C++ algorithms that implements the singular value matrix decomposition. Widely used in house and by REVEAL users.

- 3D Deblending: C++ and Fortran source separation algorithms for overlapping data. The Fortran tool (Fugro) was one of the first available on the market and generated was a flagship for the research activity of the company.

The C-++ tool (Shearwater) was successfully used for commercial projects.

- EPSI : Fortran algorithm for shallow water multiple removal and near offset gap reconstruction.

Main projects on data interpolation :

- Anti – alias matching pursuit algorithm: C++ algorithm for the calculation of the f-k spectrum of irregularly sampled data. The tool is one of the most used tool in the seismic portfolio.

- F-x-y interpolation: C++ algorithm for the interpolation of 3D seismic data.

2008-2010	**University research assistant**

Politecnico of Turin
01/05/2008 – 31/07/2010
 Turin, Italy
Advisers: Dr. V. Socco and Dr S. Foti

"Surface wave method for the national accelerometric network site characterization" "Forward modelling algorithm optimization for surface wave propagation modelling in layered media":

research and development of Matlab and C++ tools to use seismic data for earthquake analysis and oil and gas exploration.

01/10/2007 – 31/12/2007	**Data scientist**

Data analysis consultancy for D'Appolonia S.p.A. concerning "Industrial energy and efficiency benchmarking" for the European Bank for Reconstruction and Development..

01/01/2007-31/03/2007	**Internship at Shell, Rijswijk**

The subject of the internship was the surface wave analysis..

2004-2006	**Project Geotechnical Engineer**

D'Appolonia, Genoa, Italy
Main projects: statistical evaluation of geohazard based on historical seismic data, site response and liquefaction risk evaluation.

EDUCATION AND TRAINING

01/01/2005 – 30/04/2008	**Ph.D. Geotechnical Engineering**

Politecnico of Turin

Field of study: Geophysics, mathematical modelling, data science
Final grade: Excellent
Thesis: A new approach for the inversion of Rayleigh and Scholte waves in site characterization
Advisors: Prof. Renato Lancellotta, Dr. Sebastiano Foti, Dr Valentina Socco.

During the Ph.D, I Co-supervised M.Sc. Thesis.

01/10/2002 – 04/10/2004	**M.Sc. Mathematical engineering**

Politecnico of Turin

Field of study: Applied mathematics
Final grade: 110/110 cum Laude
Thesis: Mathematical models for salt structures focused on the geomechanical behaviour.
Supervisors: Prof. R. Lancellotta, Prof. L. Preziosi , Prof. A. Quarteroni.

01/10/1999 – 04/09/2004	**B.Sc. Applied mathematics**

Politecnico of Turin

Final grade: 110/110 cum Laude

PERSONAL SKILLS

Mother tongue Italian

Other language(s)

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
English				
C2	C2	C2	C2	C2
French				
C1	C2	C1	C1	C2

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

Communication skills
Chairwoman in major international conferences
Speaker in major international conferences
Good networking and public relations skills

Job-related skills
Data science algorithms.
Mathematics, algebra, statistics and probability, logic, signal processing, physics, calculus.
Deductive and logical reasoning ability.
Adaptability to diverse topics and lateral thinking.
Curiosity and inquisitive attitude.
Accuracy and respect of deadlines.
Learning attitude

Computer skills
Advanced knowledge of C++.
Familiar with Matlab, Fortran90, intermediate knowledge of C, OpenMP and Python.
Familiar with the use of the Office Package, LaTex.
Familiar with Microsoft and Linux.

Team working skills
Ability to promote team working and to create small teams to perform a task, both with colleagues with similar and complementary skills
Highly committed to the creation of a nice working environment

AWARDS, PATENTS, PUBLICATIONS

Honours and awards
- 2011: Honourable Mention, Best Paper in Geophysics in 2011 for the paper:
- Maraschini M., Boiero D., Foti S., Socco L.V.; "Scale properties of the seismic wavefield - perspectives for full waveform matching".
- 2008: Honourable Mention for the Sclocchi award 2008 for the Ph.D. thesis.
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Patents
- Granted:
- Ross HAACKE, Gordon POOLE, Margherita MARASCHINIi, 2015, Method and device for de-blending seismic data using self-adapting and/or selective radon interpolation, US10768327B2.
- Adel Khalil, Gordon Poole, Margherita Maraschini, 2015, Hybrid deblending method and apparatus, US9207345B2, CA2902293C, MX367935B, EP2999978B1, AU2014343360B2, WO2015063597A1.
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- Patent applications:
- Gordon POOLE, Margherita MARASCHINI, Risto Siliqi, 2015, Method and device for de-blending seismic data using source signature, US 20150234066 A1, WO 2015001058 A3.
- Margherita Maraschini, 2014, Method and device for attenuating random noise in seismic data, EP2784552A2, US20140288842, CA 28459, SG10201400830YA.
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International Journal Publications
- Maraschini M., Boiero D., Foti S., Socco L.V., 2011, "Scale properties of the seismic wavefield - perspectives for full waveform matching", Geophysics, vol. 76, no. 5, ISSN 0016-8033 - Honorable Mention, Best Paper in Geophysics in 2011.
- Bergamo P., Comina C., Foti S., Maraschini M., 2011, "Seismic characterization of shallow bedrock sites with multimodal Monte Carlo inversion of surface wave data", Soil Dynamics and Earthquake Engineering, vol. 31.
- Monaco P., G. Totani, G. Barla, A. Cavallaro, A. Costanzo, A. D'Onofrio, L. Evangelista, S. Foti, S. Grasso, G. Lanzo, C. Madiai, M. Maraschini, S. Marchetti, M. Maugeri, A. Pagliaroli, O. Pallara, A. Penna, F. Santucci De Magistris, A. Saccenti, G. Scass, 2011, "Geotechnical aspects of the L'Aquila earthquake", Special Topics in Earthquake Geotechnical Engineering, ISBN 9789400720596
- Foti S., Parolai S., Bergamo P., Di Giulio G., Maraschini M., Milana G., Picozzi M., Puglia R., 2011,"Surface wave surveys for seismic site characterization of accelerometric stations in ITACA", Bulletin of Earthquake Engineering, vol. 9, pp. 1797-1820, ISSN 1570-761X.
- Vanneste M., Madshus C., Socco L.V., Maraschini M, Sparrevik P. M., Westerdahl H., Duffaut K., Skomedal E., Bjørnar T. I., 2011, "On the use of NGI's prototype seabed coupled shear wave vibrator for 1 shallow soil characterization – Part I: Acquisition and processing of multimodal surface waves". Geophysical Journal International, vol. 185, p. 237-252, doi: 10.1111/j.1365-246X.2011.04960.x.
- Socco L.V., Boiero D., Maraschini M., Vanneste M., Madshus C., Westerdahl H., Duffaut K., Skomedal E., 2011, "On the use of NGI's prototype seabed coupled shear wave vibrator for 1 shallow soil characterization – Part II: Joint Inversion of multmodal Love and Scholte surface waves", Geophysical Journal International, vol. 185, pp. 237-252, doi: 10.1111/j.1365-246X.2011.04961.x.
- Maraschini M., Foti S., 2010, "A Monte Carlo multimodal inversion of surface waves", Geophysical Journal International, vol. 182, Issue 3, pages 1557–1566, doi: 10.1111/j.1365-246X.2010.04703.x.
- Maraschini M, Ernst F, Foti S., Socco V, 2010, "A new misfit function for multimodal inversion of surface waves", Geophysics, vol. 75, pp. 31-43, - ISSN 0016-8033.
- Socco L.V, Jongmans D., Boiero D., Stocco, S., Maraschini M, Tokeshi, K., Hantz, D., 2010, "Geophysical investigation of the Sandalp rock avalanche deposits", Journal of Applied Geophysics, doi: 10.1016/j.jappgeo.2009.12.005.

Selected Conference Publications	
	▪ Maraschini M., Grion S., 2017, "Blended De-signature - A New Approach to Source Separation", Proceedings of 79th EAGE Conference & Exhibition.

Selected Conference Publications

- Maraschini M., Grion S., 2017, "Blended De-signature - A New Approach to Source Separation", Proceedings of 79th EAGE Conference & Exhibition.
- Maraschini M., Kielius A, Grion S., 2016, "Rank-reduction deblending for record length extension: The example of the Carnarvon basin", Proceedings of 86th SEG Annual Meeting, Dallas.
- Poole G., Stevens K., Maraschini M., Mensch T., 2014, "Blended dual-source acquisition and processing of broadband data", Proceedings of 76th EAGE Conference & Exhibition, Amsterdam.
- Maraschini M., Turton N., 2013, "Assessing the impact of a non-local-means random noise attenuator on coherency", Proceedings of 83rd SEG Annual Meeting, Houston.
- Elboth T., Aune H., de Graaff, E., Maraschini M., Cole S, 2012, "Advances in marine seismic acquisition", 11th Simposio Bolivariano - Exploracion Petrolera en las Cuencas Subandinas.
- Maraschini M., Dyer R., Stevens K., Bird D., King, S., 2012, "An iterative SVD method for deblending: theory and examples", Proceedings of 82nd SEG Annual Meeting, Las Vegas.
- Socco L.V., Boiero D., Foti S., Maraschini M., Piatti C., Bergamo P., Garofalo F., Pastori M., Del Molino G., 2010, "Surface wave analysis for S-wave static correction computation", Proceedings of 80th SEG Annual Meeting, Denver.
- Donofrio A, Evangelista L, Landolfi L, Silvestri F, Boiero D, Foti S., Maraschini M, Comina C, Santucci De Magistris F, 2010, "Geotechnical Characterization of the C.A.S.E. project sites", Sustainable development strategies for constructions in Europe and China, Rome.
- Boiero D., Maraschini M. and Socco L.V., 2009, "P and S Wave Velocity Model Retrieved by Multi Modal Surface Wave Analysis", Proceedings of 71st EAGE Conference & Exhibition, Amsterdam.
- Maraschini M., Boiero D., Ernst F., Foti S., Socco L.V., 2008, "A new approach for multimodal inversion of Rayleigh and Scholte waves", Proceedings of 70th EAGE Conference & Exhibition, Rome.

Ph.D. Thesis

Maraschini M., 2008, "A new approach for the inversion of Rayleigh and Scholte waves in site characterization", Ph. D. thesis, Politecnico di Torino.
http://areeweb.polito.it/ricerca/engel/downloads/TESI_Maraschini.pdf

Memberships

SEG
EAGE
Fempeak
DataKind

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