

PERSONAL INFORMATIONS **Valentina Schenone**

## EDUCATION AND TRAINING

11/2020 – 11/2023

**Research Fellow**

(art. 22 L. 240/2010) at the University of Genoa (DITEN)  
with a project entitled "*Development of data inversion methods for microwave diagnostics of stroke*,"  
(contract no. 3655, Aug. 1, 2023).

11/2020 – 11/2023

**PhD in Science and Technology for Electronic and Telecommunication Engineering**

Department of Electrical, Electronic, Telecommunications Engineering and Naval Architecture,  
University of Genova  
Theme: *Novel inversion techniques for electromagnetic diagnostics*

11/2020

**Italian Habilitation for the Profession of Engineer  
(final grade: 50/50)**

University of Genova

09/2018 - 07/2020

**Master degree in Electronic Engineering, LM-29 class ex D.M. 270/2004  
(final grade 110/110 with honors)**

Department of Electrical, Electronic, Telecommunications Engineering and Naval Architecture,  
University of Genova  
Thesis: *Development and Validation of a Nonlinear Microwave Imaging Method for Brain Stroke Detection*

01/2017 - 07/2019

**First Level Diploma of Higher School IANUA-ISSUGE  
Course in Science and Technology for Information**

Ianua-Scuola Superiore dell'Università di Genova  
University of Genova

09/2015 - 07/2018

**Bachelor degree in Electronic and Information Technology Engineering, class L-8  
ex D.M. 270/2004  
(final grade 110/110 with honors)**

Electrical, Electronics and Telecommunication Engineering and Naval Architecture Department  
University of Genova, Polytechnic School  
Thesis: *Data driven identification of fuel cell failures based on Kernel methods*

09/2009- 06/2015

**Scientific High School Diploma**  
**(final grade 100/100 with honneurs)**  
 Martin Luther King High School, Genova

**PERSONAL SKILLS**

Native language Italian

Other languages

	COMPREHENSION		SPEAKING		WRITTEN PRODUCTION
	Listening	Reading	Interaction	Oral production	
English	B2	C1	C1	B2	C1

- Digital and computer skills**
- Competence in operating systems;
  - Programming skills in C, C ++, C #, JavaScript language;
  - Skills in programming environments: Matlab, Visual Studio, PSpice, Microwind, Quartus, Unity, Atmel Studio;
  - VHDL programming skills;
  - Expertise in software for electromagnetic modelling.

**ADDITIONAL INFORMATION**

Conferences and seminars

***Roles in the Organization of International Conferences***

Chair of the Local Organising Committee of the 2023 *IEEE Conference on Antenna Measurements and Applications (2023 IEEE CAMA)*, Genoa, Italy, 15-17 November 2023.

Organizer of the Convened Session “Ground Penetrating Radar: Applications and Advancements” at the international conference *European Geosciences Union General Assembly 2023*, Vienna (Austria) & Online, 23-28 April 2023 (Organizers: R. Persico, S. Piro, M. Bevacqua, V. Schenone, I. Catapano).

Chair of the Session “Imaging Systems and MRI” at the *2022 IEEE International Conference on Imaging Systems and Techniques (IST 2022)*, Virtual conference, 21-23 June, 2022.

***Seminars***

Invited seminar on “Advanced techniques for the characterization of buried structures starting from GPR data” (Speakers: V. Schenone, A. Fedeli) organised by the Italian Georadar Association and carried out in collaboration with the University of Palermo, the University of Genoa, the Institute of Methodologies for Environmental Analysis (IMAA-CNR) and the University of Calabria, 7 April 2023 (online).

***Participation in Scientific Conferences***

- *European Geosciences Union General Assembly 2023*, Vienna (Austria) & Online, 23–28 April 2023 presenting the paper: A. Fedeli, V. Schenone, M. Pastorino, and A. Randazzo, “Quantitative inverse scattering analysis for ground penetrating radar imaging”.
- *European Conference on Antennas and Propagation (EuCAP)*, Florence, Italy, 26 - 31 March, 2023 presenting the papers:  
 V. Schenone, A. Fedeli, C. Estatico, M. Pastorino and A. Randazzo, “Assessment of a non-Hilbertian inverse scattering approach for electromagnetic tomography in subsurface environments”  
 V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, “Identification of defective elements in antenna arrays through an inverse approach”  
*Riunione Nazionale di Elettromagnetismo (RINEM)*, Catania, 18-21 September, 2022 presenting the paper: V. Schenone and A. Fedeli, “Microwave imaging by an FE-method based on variable-exponent spaces”.
- *International Conference on Electromagnetics in Advanced Applications (ICEAA)*, Virtual format, 5-9 September, 2022 presenting the paper: A. Fedeli, V. Schenone, M. Pastorino and

A. Randazzo, "FE-based microwave inverse scattering in nonconstant-exponent spaces: a numerical assessment".

- 2021 *IEEE Conference on Antenna Measurements & Applications (CAMA)*, Antibes Juan-les-Pins, France, November 15-17, 2021 presenting the paper: V. Schenone, A. Fedeli, M. Pastorino, A. Randazzo, "An antenna array diagnostic technique based on a Lebesgue-space inversion procedure".
- *SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS21)*, Milano, Italy, June 21-24, 2021 (online due to Covid-19) presenting the paper: C. Estatico, A. Fedeli, M. Pastorino, A. Randazzo and V. Schenone, "Inversion of ground penetrating radar data in nonconstant-exponent Lebesgue spaces".

#### Honour and awards

##### *Winner of the following contests:*

- IRIS University of Genova Award, Polytechnic School, 2017. Contest among the students enrolled in the first year of the Polytechnic School.
- IRIS University of Genova Award, University of Genova, 2017. Contest among the students enrolled in the first year of the University of Genova.  
The IRIS indicator, Student Interfaculty Performance Indicator, evaluates the efficiency and effectiveness with which students pass their first year exams at the University of Genova.
- Prof. Gianfranco COLETTI Degree Award, 2019. Contest among the graduates of the bachelor courses of the University of Genova in Electrical Engineering, Electronic Engineering and Information Technology, Nautical Engineering, Naval Engineering who obtained the best result in the graduation sessions from 1st June 2018 to 29th March 2019.
- "IEEE AP-S Ulrich L. Rohde Innovative Conference Paper Award on Antenna Measurements and Applications" for the paper titled "An Antenna Array Diagnostic Technique Based on a Lebesgue-Space Inversion Procedure" presented at IEEE Conference on Antenna Measurements & Applications (CAMA) in 2021.
- "Premio Internazionale Galileo Galilei Giovani", 2023. Contest reserved for young researchers who have distinguished themselves in the humanities or sciences and have carried out their research in Liguria and in the provinces of Alessandria, Asti and Cuneo districts financed by District 2032 IT in collaboration with the International Galileo Galilei Prize Foundation of Italian Rotary Clubs in 2023.

##### *Reviewer for International Journals:*

- "IEEE Transactions on Instrumentation and Measurement" (since 2023)
- "IEEE Open Journal on Antennas and Propagation" (since 2023)
- "IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing" (since 2023)
- "IEEE Geoscience and Remote Sensing Letters" (since 2023)
- "International Journal of Geoscientific Instrumentation, Methods and Data Systems (eISSN: 2193-0864)" (since 2022)

##### *Reviewer for International Conferences:*

- "IEEE International Conference of Metrology for eXtended Reality, Artificial Intelligence and Neural Engineering (MetroXRaine 2023)"
- "IEEE International Conference on Antenna Measurements and Applications (CAMA 2023)"

#### Networks and memberships

International collaboration with the company EMTensor GmbH, Vienna, Austria on systems and algorithms for quantitative microwave imaging applied to stroke diagnostics (since 2020, referee Prof. Serguei Semenov) resulting in the publication [1] "Nonlinear S-parameters inversion for stroke imaging"

National collaboration with the Department of Engineering, University of Roma Tre, Rome, Italy. Inversion techniques for electromagnetic diagnostics of conformal antennas (from 2020).

Affiliation to the national society "Research Unit of the National Interuniversity Consortium for Telecommunications (CNIT) of the University of Genoa" (from 2022)

#### Projects

Research Project PRIN 2017 "Quick, reliable, cost effective methodology for Diagnostics of Conformal Antennas" (DI-CA). Member of the research unit in Genoa (project started on 01/04/2019).

Research Project Eureka Eurostars: "MICROwave Temperature Evaluation for Additive Manufacturing", Member of the research unit in Genoa (project started on 01/11/2022).

#### Teaching activities

Teaching support activities for the following courses at the University of Genova:

- Electromagnetic Sensing and Imaging, Master Degree in Electronic Engineering, a.y. 2022/2023.

- Electromagnetic Propagation, Master Degree in Internet and Multimedia Engineering, a.y. 2022/2023.
- Antennas, Master Degree in Internet and Multimedia Engineering, Italy, a.y. 2023/2024.
- Radio-Frequency and Microwave Circuits, Master Degree in Electronic Engineering, a.y. 2023/2024.

Co-tutor of the following Bachelor and Master theses at the University of Genova:

- 6 Bachelor theses in Electronic Engineering and Information Technology;
- 1 Master thesis in Electronic Engineering;
- 1 Master thesis in Internet and Multimedia Engineering.

“Cultore della Materia” and Member of the Examination Committee for the following courses at the University of Genova since the academic year 2022/2023:

- Radio-Frequency and Microwave Circuits (Master Degree in Electronic Engineering).
- Advanced Electromagnetics Engineering (Master Degree in Electronic Engineering).

#### Publications *International Journals*

- [1] A. Fedeli, V. Schenone, A. Randazzo, M. Pastorino, T. Henriksson, and S. Semenov, “Nonlinear S-parameters inversion for stroke imaging,” *IEEE Transactions on Microwave Theory and Techniques*, vol. 69, no. 3, pp. 1760–1771, Mar. 2021, doi: 10.1109/TMTT.2020.3040483
- [2] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, “Experimental assessment of a novel hybrid scheme for quantitative GPR imaging,” *IEEE Geoscience and Remote Sensing Letters*, vol. 19, pp. 1–5, 2022, doi: 10.1109/LGRS.2021.3121808
- [3] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, “Microwave imaging of mixed metallic-dielectric configurations via an FE-based variable-exponent approach,” *URSI Radio Science Letters*, vol. 3, pp. 1–5, 2021, doi: 10.46620/21-0036
- [4] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, “Detection of failures in antenna arrays through a Lebesgue-space approach”, *IEEE Open Journal of Antennas and Propagation*, vol. 3, pp. 652-662, 2022, doi: 10.1109/OJAP.2022.3181345
- [5] V. Schenone, G. L. Gagnani, M. Pastorino, A. Randazzo, and A. Fedeli, “Assessment of subsurface microwave characterization through combined FE and variable-exponent spaces technique”, *Sensors*, vol. 23, no. 1, p. 167, Dec. 2022, doi: 10.3390/s23010167
- [6] V. Schenone, C. Estatico, M. Pastorino, A. Randazzo, and A. Fedeli, "Electromagnetic imaging in stratified media by means of a finite-element variable-exponent inversion approach," *URSI Radio Science Letters*, vol. 4, pp. 1-4, 2022, doi: 10.46620/22-0067

#### *International Conferences*

- [7] J. Bellitto, V. Schenone, F. Bellotti, R. Berta, and A. De Gloria, "Fine-grain traffic control for smart intersections," in *Applications in Electronics Pervading Industry, Environment and Society*, editors: S. Saponara and A. De Gloria, in Lecture Notes in Electrical Engineering. Cham: Springer International Publishing, 2020, pp. 349–354
- [8] A. Fedeli, V. Schenone, C. Estatico, M. Pastorino, and A. Randazzo, “Nonlinear inverse-scattering in variable-exponent spaces for multifrequency subsurface imaging”, in *Proceedings of European Conference on Antennas and Propagation (EuCAP)*, Virtual Conference, 22-26 March, 2021, doi: 10.23919/EuCAP51087.2021.9411107
- [9] C. Estatico, A. Fedeli, M. Pastorino, A. Randazzo, and V. Schenone, “Inversion of ground penetrating radar data in nonconstant-exponent Lebesgue spaces”, in *Proceedings of the SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS21)*, Milano, Italy, 21-24 June, 2021.
- [10] A. Fedeli, V. Schenone, M. Pastorino, and A. Randazzo, “FE-based microwave inverse scattering in nonconstant-exponent spaces: a numerical assessment”, in *Proceedings of the International Conference on Electromagnetics in Advanced Applications (ICEAA)*, Honolulu, Hawaii, USA, 9-13 August, 2021., doi: 10.1109/ICEAA52647.2021.9539589.
- [11] A. Randazzo, C. Ponti, V. Schenone, A. Fedeli, C. Estatico, P. D’Atanasio, M. Pastorino, and G. Schettini, “Through-the-wall imaging through a hybrid inverse-scattering procedure”, in *Proceedings of the URSI General Assembly (URSI GASS)*, Rome, Italy, 28 August- 4 September, 2021, doi: 10.23919/URSIGASS51995.2021.9560268.

- [12] V. Schenone, A. Fedeli, M. Pastorino, and A. Randazzo, "An antenna array diagnostic technique based on a Lebesgue-space inversion procedure", in *Proceedings of the 2021 IEEE Conference on Antenna Measurements & Applications (CAMA)*, Antibes Juan-les-Pins, France, November 15-17, 2021, doi: 10.1109/CAMA49227.2021.9703531.
- [13] V. Schenone, A. Fedeli, M. Pastorino, A. Randazzo, and C. Estatico, "Microwave imaging of dielectric targets by means of a variable-exponent finite-elements approach", in *Proceedings of the 2021 IEEE Conference on Antenna Measurements & Applications (CAMA)*, Antibes Juan-les-Pins, France, 15-17 November, 2021, doi: 10.1109/CAMA49227.2021.9703641
- [14] A. Fedeli, V. Schenone, M. Pastorino, and A. Randazzo, "Multistatic electromagnetic imaging of dielectric targets with LSTM Cells", in *Proceedings of European Conference on Antennas and Propagation (EuCAP)*, Madrid, Spain, 27 March – 01 April, 2022, doi: 10.23919/EuCAP53622.2022.9769681.
- [15] A. Fedeli, V. Schenone, M. Pastorino, and A. Randazzo, "Qualitative-enhanced full-waveform inversion of ground penetrating radar data", in *Proceedings of European Geosciences Union General (EGU) Assembly*, Vienna, Austria & Online, 23–27 May, 2022,
- [16] V. Schenone, A. Fedeli, A. Sciarrone, I. Bisio, C. Estatico, F. Lavagetto, M. Pastorino, and A. Randazzo, "A multifrequency imaging method for microwave-based stroke diagnostics", in *Proceedings of URSI Atlantic Radio Science Meeting (AT-RASC)*, Gran Canaria, Spain, 29 May – 3 June 2022.
- [17] V. Schenone, A. Fedeli, M. Pastorino, and A. Randazzo, "An antenna array diagnostic approach based on a novel non-Hilbertian optimization technique", in *Proceedings of URSI Atlantic Radio Science Meeting (AT-RASC)*, Gran Canaria, Spain, 29 May – 3 June, 2022.
- [18] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "Microwave imaging in stratified media by means of a finite-element variable-exponent inversion approach", in *Proceedings of URSI Atlantic Radio Science Meeting (AT-RASC)*, Gran Canaria, Spain, 29 May – 3 June 2022.
- [19] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "A hybrid qualitative-quantitative electromagnetic imaging method for subsurface prospecting", in *Proceedings of 2022 IEEE International Conference on Imaging Systems and Techniques (IST 2022)*, Virtual conference, 21-23 June, 2022, doi: 10.1109/IST55454.2022.9827669.
- [20] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "Nonlinear inversion for microwave characterization of targets in non-homogeneous media", in *Proceedings of the International Conference on Electromagnetics in Advanced Applications (ICEAA)*, Hybrid format, Cape Town, South Africa, 5-9 September, 2022, doi: 10.1109/ICEAA49419.2022.9899997.
- [21] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "A non-Hilbertian inversion technique for the diagnosis of faulty elements in antenna arrays", in *Proceedings of the International Conference on System-Integrated Intelligence Intelligent, flexible and connected systems in products and production (SYSINT)*, Genoa, 7-9 September, 2022, doi: 10.1007/978-3-031-16281-7\_17.
- [22] A. Fedeli, V. Schenone, M. Pastorino, and A. Randazzo, "An LSTM based strategy for data and model calibration in subsurface electromagnetic imaging", Accepted to be presented at *the 2022 IEEE Conference on Antenna Measurements & Applications (CAMA)*, Guangzhou, China, 15-17 December, 2022, doi: 10.1109/CAMA56352.2022.10002550.
- [23] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "Identification of defective elements in antenna arrays through an inverse approach", in *Proceedings of European Conference on Antennas and Propagation (EuCAP)*, Florence, Italy, 26 - 31 March, 2023, doi: 10.23919/EuCAP57121.2023.10133355.
- [24] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, I. Bisio, F. Lavagetto, A. Sciarrone, and A. Randazzo, "A multifrequency electromagnetic imaging approach for the detection of brain injuries", in *Proceedings of European Conference on Antennas and Propagation (EuCAP)*, Florence, Italy, 26 - 31 March, 2023, doi: 10.23919/EuCAP57121.2023.10133540.
- [25] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "Assessment of a non-Hilbertian inverse scattering approach for electromagnetic tomography in subsurface environments", in *Proceedings of European Conference on Antennas and Propagation (EuCAP)*, Florence, Italy, 26 - 31 March, 2023, doi: 10.23919/EuCAP57121.2023.10133256.
- [26] A. Fedeli, V. Schenone, M. Pastorino, and A. Randazzo, "Quantitative inverse scattering analysis for ground penetrating radar imaging", in *Proceedings of European Geosciences Union General (EGU) Assembly*, Vienna, Austria & Online, 23–28 April 2023.

- [27] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "A multifrequency finite-element variable-exponent inversion method for microwave imaging applications", in *Proceedings of Photonics and Electromagnetics Research Symposium (PIERS)*, Prague, Czech Republic,, 3-6 July, 2023.
- [28] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "Antenna array diagnostics through a Lebesgue-space inversion technique", in *Proceedings of Photonics and Electromagnetics Research Symposium (PIERS)*, Prague, Czech Republic,, 3-6 July, 2023.
- [29] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "Quantitative imaging of buried targets through a Variable-exponent finite-element approach", in *Proceedings of Photonics and Electromagnetics Research Symposium (PIERS)*, Prague, Czech Republic,, 3-6 July, 2023.
- [30] A. Randazzo, A. Fedeli, V. Schenone, and M. Pastorino, "A 2-d green's function for microwave imaging in an elliptically-layered cylindrical pec enclosure", in *Proceedings of Photonics and Electromagnetics Research Symposium (PIERS)*, Prague, Czech Republic, 3-6 July, 2023.
- [31] V. Schenone, A. Fedeli, C. Estatico, M. Pastorino, and A. Randazzo, "a regularization approach in Lebesgue spaces for antenna array diagnostics", in *Proceedings of the URSI General Assembly (URSI GASS)*, Sapporo, Japan, 19-26 August, 2023.
- [32] V. Schenone, A. Fedeli, M. Pastorino, and A. Randazzo, "Quantitative imaging of targets embedded in a layered environment by a vls-fe nonlinear inversion method", in *Proceedings of the URSI General Assembly (URSI GASS)*, Sapporo, Japan, 19-26 August, 2023.
- [33] V. Schenone, A. Fedeli, M. Pastorino, and A. Randazzo, "Simultaneous exploitation of multifrequency data in variable-exponent electromagnetic imaging with finite-element modeling", in *Proceedings of the URSI General Assembly (URSI GASS)*, Sapporo, Japan, 19-26 August, 2023.
- [34] A. Fedeli, V. Schenone, C. Estatico, M. Pastorino, and A. Randazzo, "Enhancing microwave imaging by preprocessing data with learning-based strategies", in *Proceedings of the URSI General Assembly (URSI GASS)*, Sapporo, Japan, 19-26 August, 2023.
- [35] A. Fedeli, M. Maheswaran, V. Schenone, A. Sciarrone, I. Bisio, F. Lavagetto, M. Pastorino, and A. Randazzo, "A multifrequency inverse-scattering technique for brain stroke microwave diagnostics", Accepted to be presented at *2023 IEEE International Conference of Metrology for eXtended Reality, Artificial Intelligence and Neural Engineering (MetroXRAINE)*, Italy, Milan, 25-27 October, 2023.
- [36] V. Schenone, A. Fedeli, C. Parodi, A. Sciarrone, I. Bisio, A. Rossi, F. Lavagetto, and A. Randazzo, "Microwave imaging for the diagnosis of stroke in pediatric patients: an initial study", submitted at *2023 IEEE Conference on Antenna Measurements & Applications (CAMA)*, Genoa, Italy, November 15-17, 2021.
- [37] V. Schenone, A. Fedeli, C. Estatico, and A. Randazzo, "Diagnosis of defective elements in steerable antenna arrays by means of a non-standard regularization approach", submitted at *2023 IEEE Conference on Antenna Measurements & Applications (CAMA)*, Genoa, Italy, November 15-17, 2023.

#### National Conferences

- [38] V. Schenone and A. Fedeli, "Microwave imaging by an FE-method based on variable-exponent spaces", *Riunione Nazionale di Elettromagnetismo (RINEM)*, Catania, 18-21 September, 2022.

#### Book chapters

- [39] A. Fedeli, V. Schenone, M. Pastorino, A. Randazzo, C. Estatico, I. Bisio, F. Lavagetto, and A. Sciarrone, "Microwave imaging in non-conventional Lebesgue spaces: overview and application to brain stroke imaging" in *CNIT Technical report 10 - Microwave imaging based on inverse scattering: techniques, systems and applications*, M. Pastorino and A. Randazzo eds., Texmat, 2023, ISBN 9788894982633.
- [40] V. Schenone, A. Fedeli, M. Pastorino, and A. Randazzo, "Nonlinear and hybrid inversion techniques for ground penetrating radar imaging" in *Ground Penetrating Radar, from Theoretical Endeavors to Computational Electromagnetics, Signal Processing, Antenna Design and Field Application*, D. Lesselier and M. Serhir eds., London, ISTE, in press.

Autorizzo il trattamento dei miei dati personali presenti nel CV ai sensi dell'art. 13 d. lgs. 30 giugno 2003 n. 196 - "Codice in materia di protezione dei dati personali" e dell'art. 13 GDPR 679/16 - "Regolamento europeo sulla protezione dei dati personali".

Genova 11/03/2024

Firma

(Valentina Schenone)