Eleonora Maset

Curriculum Vitae

Personal information

- Place and date of birth: Conegliano (TV, Italy) – August 19, 1990
- Nationality: Italian
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- Scopus Author Identifier: 56543170700
- Web of Science ResearcherID: GPF-7595-2022
- ORCID: 0000-0003-3689-1960
- Google Scholar: https://scholar.google.com/citations?hl=it&user=1-2pcukAAAAJ
- ResearchGate: https://www.researchgate.net/profile/Eleonora-Maset
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Current academic position

February 2023 – present

Assistant professor (Ricercatrice RTD-A) at the Polytechnic Department of Engineering and Architecture, University of Udine (Italy), sector CEAR-04/A (Geomatics).

Title of the research project: *Development of automated systems for monitoring and 3D modelling of the environment, using remote sensing techniques based on terrestrial, mobile, aerial and satellite platforms*, carried out within the NRRP project iNEST (Interconnected Nord-Est Innovation Ecosystem), Spoke 1 *Ecosystems for Mountain Innovations*, led by the Free University of Bozen-Bolzano.

Professional Qualifications

December 2023 – present

National Scientific Qualification as associate professor in the Italian higher education system, for the disciplinary field of 08/CEAR-04 – Geomatics, valid from 06/12/2023 to 06/12/2034.

Working experience

January 2022 – January 2023	Research fellow (Assegnista di ricerca) at the Polytechnic Department of Engineering and Architecture, University of Udine (supervisor prof. Alessandro Gasparetto). Title of the research project: *Analysis of technological trends and identification of development lines for the enhancement of research and technology transfer activities, with particular reference to mechatronics, robotics, for digitization, innovation, competitiveness, culture, the infrastructures for sustainable mobility, education and research*.
October 2019 – January 2023	Contract teacher of the course *Numerical Cartography and GIS* at the Polytechnic Department of Engineering and Architecture, Bachelor's degree in Civil and Environmental Engineering, University of Udine.
January 2021 – December 2021	Research Fellow (Assegnista di ricerca) at the Department of Agricultural, Food, Environment and Animal Sciences, University of Udine (supervisor prof. Federico Cazorzi). Title of the research project: *River bed hydraulic parameters measure by photogrammetry and debris flow forecast system test*, funded by the INTERREG V-A Italy Austria 2014-2020 project INADEF (INnovative eArly warning system for DEbris Flow events based on nowcasting and phenomenology).
September 2020 – November 2020	Research assignment at the Polytechnic Department of Engineering and Architecture, University of Udine (supervisor prof. Andrea Fusiello). Title of the research project: *Implementation of photogrammetric orientation algorithms for single and multi-camera systems*, commissioned by See Through s.r.l. for the development of a head tracking system.
July 2019 – June 2020	Research fellow (Assegnista di ricerca) at the Polytechnic Department of Engineering and Architecture of University of Udine (supervisor prof. Andrea Fusiello). Title of the research project: *Classification of aerial images and LiDAR data*, funded by Helica s.r.l.
March 2019 – April 2019	Research assignment at the Department of Humanities and Cultural Heritage, University of Udine. Title of the research project: *Creation of photogrammetric three-dimensional models and rendering of the decorations of the Magna Graecia vases of the Museums of History and Art of Trieste*, funded by the project "PRID 2017 - DIUM: Dalla Teca alla Rete".

Education and training

2015 – 2019	Ph.D. in Industrial and Information Engineering at the Polytechnic Department of Engineering and Architecture, University of Udine. Ph.D. final exam discussed on 05/03/2019. Research project funded by Helica s.r.l. – Amaro (UD, Italy). Title of the Ph.D. thesis: *Advanced methods for LiDAR and photogrammetric data processing: from Procrustes Analysis to Deep Learning*. Supervisors: prof. Andrea Fusiello, prof. Fabio Crosilla.
2013 – 2015	Master's degree in Environmental and Territorial Engineering (10/04/2015) at the University of Udine, grade: 110/110 cum laude. Title of the Master's thesis: *Unsupervised classification of raw full-waveform airborne LiDAR data by Self Organizing Maps*. Supervisors: prof. Fabio Crosilla, prof. Roberto Carniel.
2009 – 2013	Bachelor's degree in Environmental and Resource Engineering (05/04/2013) at the University of Udine, grade: 110/110 cum laude. Title of the Bachelor's thesis: *Reliable exterior orientation by a robust anisotropic orthogonal procrustes algorithm* Supervisors: prof. Fabio Crosilla, prof. Andrea Fusiello.
2004 – 2009	Scientific high school diploma, Liceo Marconi in Conegliano, grade: 100/100.

Research activity

My research interests include the implementation of image orientation algorithms and the use of photogrammetric techniques for the 3D survey and reconstruction of the territory and cultural heritage. Furthermore, I am working on the acquisition of laser scanning data with mobile mapping systems, based on SLAM technology. The research activity also focuses on the subsequent processing and classification of the point clouds obtained with different survey techniques, in particular by using Deep Learning approaches.

The research activity is testified by over 50 editorial products. The full list of publications can be found at the following link: https://air.uniud.it/cris/rp/rp14924.

Bibliometric indicators

The following bibliometric indicators are compared with the threshold values of the disciplinary field 08/CEAR-04 Geomatics. Source: Scopus database, updated on 30/12/2024.

II fascia 08/CEAR-04	n. articles 5 years	n. cit. 10 years	H-index 10 years
Threshold	3	40	4
Candidate	18	457	12
Ratio	6.0	11.4	3.0

I fascia 08/CEAR-04	n. articles 10 years	n. cit. 15 years	H-index 15 years
Threshold	5	65	5
Candidate	21	457	12
Ratio	4.2	7.0	2.4

Commissioners 08/CEAR-04	n. articles 10 years	n. cit. 15 years	H-index 15 years
Threshold	8	68	5
Candidate	21	457	12
Ratio	2.6	6.7	2.4

Speaker at national and international conferences

Geomatics Youth Meeting 2024 – oral presentation
Title of the presentation: *Multi-temporal photogrammetry and laser scanning for monitoring sediment dynamics in mountain torrents*
Rome (Italy) – January 2024

#AsitaAcademy2023 – oral presentation
Title of the paper: *On the role of Geomatics and official regional cartography in the Interconnected Nord-Est Innovation Ecosystem*
Digital Edition – December 2023

6th World Landslide Forum – oral presentation
Title of the presentation: *Point clouds for terrain monitoring in vegetated areas*
Florence (Italy) – November 2023

Technology for All (8th ed.) – oral presentation
Title of the presentation: *Mobile robotics and autonomous mapping*
Rome (Italy) – November 2023

65th SIFET Congress – poster presentation
Title of the contribution: *Survey sulle tecniche geomatiche utilizzate per l'analisi dei danni delle strutture e all'ambiente a seguito di calamità*
Arezzo (Italy) – September 2023

12th International Symposium on Mobile Mapping Technology – oral presentation
Title of the paper: *Feasibility and accuracy of as-built modelling from SLAM-based point clouds: Preliminary results*
Padua (Italy) – May 2023

XXIV ISPRS Congress (2022 edition) – oral presentation
Title of the paper: *Combining LiDAR SLAM and deep learning-based people detection for autonomous indoor mapping in a crowded environment*
Nice (France) – June 2022

XXIV ISPRS Congress (2022 edition) – poster presentation
Title of the paper: *Integration of photogrammetry and portable mobile mapping technology for 3D modeling of cultural heritage sites: The case study of the Bziza temple*
Nice (France) – June 2022

IFToMM for Sustainable Development Goals (I4SDG) 2021 – oral presentation
Title of the paper: *Preliminary comparison between handheld and mobile robotic mapping systems*
Digital Edition – November 2021

XXIV ISPRS Congress (2021 edition) – poster presentation
Title of the paper: *Investigating the performance of a handheld Mobile Mapping System in different outdoor scenarios*
Digital Edition – July 2021

#AsitaAcademy2021 – oral presentation
Title of the paper: *Automatic co-registration of Copernicus time series via synchronization*
Digital Edition – July 2021

XXIV ISPRS Congress (2020 edition) – oral presentation
Title of the paper: *Bundle Block Adjustment with Constrained Relative Orientations*
Digital Edition – September 2020

ISPRS Geospatial Week – oral presentation
Title of the paper: *Improving automatic reconstruction of interior walls from point cloud data*
Enschede (The Netherlands) – June 2019

ISPRS TC II Symposium – oral presentation
Title of the paper: *Seamless image mosaicking via synchronization*
Riva del Garda (TN, Italy) – June 2018

ISPRS TC II Symposium – oral presentation
Title of the paper: *4D-SfM photogrammetry for monitoring sediment dynamics in a debris-flow catchment: Software testing and results comparison*
Riva del Garda (TN, Italy) – June 2018

International Conference on Computer Vision (ICCV) – poster presentation
Title of the paper: *Practical and efficient multi-view matching*
Venice – October 2017

International Conference on Image Analysis and Processing (ICIAP) – poster presentation
Title of the paper: *Synchronization in the symmetric inverse semigroup*
Catania – September 2017

UAV in Geomatics (UAV-g) – oral presentation

Title of the paper: *Photogrammetric 3D building reconstruction from thermal images*
Bonn (Germany) – September 2017

International Conference on Image Analysis and Processing (ICIAP) – poster presentation
Title of the paper: *Unsupervised classification of raw full-waveform airborne LiDAR data by Self Organizing Maps*
Genoa – September 2015

Tutorials

Magri L., Barath D., Xiao G., **Maset E.**, Fusiello A. (2021). Multiple parametric models fitting. *25th International Conference on Pattern Recognition, Virtual - Milan, 10-15 January 2021*.

Arrigoni F., **Maset E.**, Fusiello A., Bernard F. (2021). Synchronization: a general framework for mosaicking, 3D reconstruction, matching and segmentation problems. *25th International Conference on Pattern Recognition, Virtual - Milan, 10-15 January 2021*.

Research projects

Principal investigator of the project **GIS4HydroPlan** (Design and development of an open-source GIS plugin to support HYDROlogical and watershed management PLANning in mountain basins), funded by the Young Researchers' Call of the University of Udine within the framework of the research programme iNEST – Interconnected Nord-Est Innovation Ecosystem (National Recovery and Resilience Plan, M4C2 – Investment 1.5, funded by the European Union, Next Generation EU). The aim of the project is to develop a simple and practical GIS tool that integrates various functions for hydrological and watershed management planning, for a direct and accessible understanding of the characteristics of the basin under study and of the interaction between hydro-geological processes and torrent control works.

Member of the research group of the project **iNEST (Interconnected Nord-Est Innovation Ecosystem)**, funded by the Next Generation EU within the National Recovery and Resilience Plan. In particular, I am involved in Spoke 1, led by the Free University of Bolzano, whose main objective is to foster the development of new products, processes and lifestyles capable of consolidating or sustaining the local traditions that guarantee the survival and demographic viability of mountain contexts in every respect (economic, environmental and social). Among the research topics, my research activity focuses on mitigating risks that are particularly relevant in these contexts (fragmentation and security of production systems, difficult logistics, hydrological risks, reduced quality of life). In addition to the Free University of Bolzano and the University of Udine, the spoke involves also the Ca' Foscari University of Venice, the Universities of Padova and Verona and the Eurac Research center.

Member of the research group of the project **INTERREG V-A Italy Austria 2014-2020 INADEF** (INnovative eArly warning system for DEbris Flow events based on nowcasting and phenomenology), developed within the framework of a cross-border institutional collaboration among three Italian partners – ARPAV, University of Padova and University of Udine – and two Austrian partners – BFW and ZAMG. The project led to the implementation of an innovative warning system to mitigate the hydrogeological risk induced by debris flows by reducing the warning time.

Member of the research group of the project **Proof of Concept** for the exploitation of the patent *Apparatus and method to classify full waveform data from retro-flected signals* (priority IT/15.05.18/ITA201800005375). The project was developed as part of the programme Unity FVG PoC 2020, funded by the Ministry of Economic Development - Italian Patent and Trademark Office. The research activities led to the implementation of a stand-alone executable software of the patented classification algorithm, which can be easily used by companies operating in the remote sensing field. Furthermore, a full-waveform data compressor was developed to reduce the large amount of data to be processed and consequently the mass memory requirements. Project activities resulted in an increase of the Technology Readiness Level from 4 to 7.

Member of the research group of the project **Northern Lebanon Project (NoLeP)**, funded by the Ministry of Foreign Affairs and International Cooperation. The aim of this joint Italian – Lebanese project, active since 2017, is a survey investigation of a significant portion of the district of Koura. In 2022, I participated in the archaeological campaign (June 23 – July 1), carrying out the survey and 3D reconstruction (based on photogrammety and portable laser scanning) of the Roman temples of the Qasr Naous complex (Ain Akrine, Lebanon).

Member of the research group for the consultancy contract commissioned by **See Through s.r.l.**. The study was aimed at the creation of a *head tracking* system to compensate for the movements of the patient's head during an X-ray scan. The activity included the development of a MATLAB software for the exterior orientation of one or more cameras imaging some targets of known position.

Member of the research group for the consultancy contract commissioned by **VirtualGeo s.r.l.**. The study was aimed at developing an algorithm for the automatic texturing of meshes, the latter generated from point clouds acquired with a laser scanner.

Member of scientific committees

Member of the scientific commitee of the *Photogrammetric Computer Vision* workshop, organized at the IEEE/CVF Conference on Computer Vision and Pattern Recognition 2023.

Editor of international journals

Guest Editor of the Special Issue *4D (Multi-Temporal) Remote Sensing: Opportunities, Challenges and Issues for Environmental Monitoring over Time* for the journal *Remote Sensing* published by MDPI (https://www.mdpi.com/journal/remotesensing/special_issues/E5WQ7991UE).

Reviewer for international scientific journals

ISPRS Journal of Photogrammetry and Remote Sensing (Elsevier); IEEE Transactions on Geoscience and Remote Sensing; Applied Geomatics (Springer); Remote Sensing (MDPI); Sensors (MDPI); Geospatial Information Science (Taylor & Francis); Remote Sensing in Earth Systems Sciences (Springer Nature); Journal of Geodesy (Springer Nature); Survey Review (Taylor & Francis); IEEE Transactions on Image Processing; IEEE Transactions on Robotics; International Journal of Computer Vision (Springer); Digital Applications in Archaeology and Cultural Heritage (Elsevier).

Reviewer for international conferences

International Conference of IFToMM for SDG (I4SDG2025); European Conference on Mechanism Science (EuCoMeS 2024); Photogrammetric Computer Vision Workshop (PCV 2023); ISPRS XXIV Congress (2022 and 2020 editions); The Fourth International Conference of IFToMM ITALY (IFIT 2022); International Conference on Computer Vision (ICCV 2021); IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2020); 25th International Conference on Pattern Recognition (ICPR 2020); IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2019); 20th International Conference on Image Analysis and Processing (ICIAP 2019); ISPRS TC II Symposium (2018); IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2018); 6th International Conference on 3D Vision (3DV 2018); 15th European Conference on Computer Vision (ECCV 2018); 19th International Conference on Image Analysis and Processing (ICIAP 2017); 28th British Machine Vision Conference (BMVC 2017); IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR 2016); 14th European Conference on Computer Vision (ECCV 2016); 4th International Conference on 3D Vision (3DV 2016).

Honors and awards

ISPRS Best Young Author Award 2020, for the Commission II of the 2020 Edition of the XXIV ISPRS Congress. Title of the paper: *Bundle Block Adjustment with Constrained Relative Orientations*.

One of the five *Best reviewers of the ISPRS XXIV Congress* (2022 Edition) for the Technical Commission II.

Membership

Member of AUTeC, Academic Association of Topography and Cartography (Associazione Universitari di Topografia e Cartografia), since 2023.

Member of SIFET, Italian Society of Photogrammetry and Topography (Società Italiana di Fotogrammetria e Topografia), since 2023.

Teaching activity

Teaching assignment

2019 – present	Teacher of the course *Numerical Cartography and GIS* (6 CFU - Bachelor's degree in Civil and Environmental Engineering, University of Udine), since the a.y. 2019/2020.
2015 – 2024	Teaching activities during the course on Topography (Bachelor's degree in Civil and Environmental Engineering, University of Udine) by prof. F. Crosilla - until a.y. 2020/2021, and prof. D. Visintini - since a.y. 2021/2022 (6 hours).

2023 Teaching activities during the course on Topographic techniques for land and construction monitoring (Master's degree in Environmental and Territorial Engineering, University of Udine) by prof. A. Beinat - a.y. 2022/2023 (6 hours).

2019 – 2022 Subject-matter expert of the scientific disciplinary sector ICAR/06 - Topography and Cartography - at the Polytechnic Department of Engineering and Architecture, University of Udine.

2022 Teacher of the course *Cartographic representations theory and italian cartography*, Doctoral Programme in Civil-Environmental Engineering and Architecture, University of Trieste and University of Udine (10 hours).

2017 – 2019 Teaching activities during the course on Numerical Cartography and GIS (Bachelor's degree in Civil Engineering, University of Udine) by prof. F. Crosilla, a.y. 2016/2017, 2017/2018 and 2018/2019 (6 hours).

2017 – 2019 Teaching activities during the course on Geomatics (Bachelor's degree in Environmental and Nature Sciences, University of Udine) by prof. M. Sigura, a.y. 2017/2018 (20 hours), 2018/2019 (15 hours) and 2019/2020 (15 hours).

2019 Teaching activities during the course on Digital Archaeology (Master's degree in Archaeology and cultures of antiquity) by prof. A. Fusiello, a.y. 2018/2019 (2 hours).

Training courses and seminars

2024 Lecturer at the seminar *Portable mapping systems and SLAM technology: Towards survey automation*, Doctoral Programme in Civil-Environmental Engineering and Architecture, University of Trieste and University of Udine (4 hours).

2021 – 2023 Lecturer at the seminar *Portable mapping systems and SLAM technology: Towards survey automation*, course on Topographic Techniques for Land and Construction Control (Master's degree in Environmental and Territorial Engineering, University of Udine) by prof. A. Beinat, a.y. 2021/2022 and 2022/2023 (2 hours).

2022 Teacher of the advanced training course *Point cloud processing for the generation of DEM*, aimed at the staff of the Surveying Unit of the Autonomous Region Friuli Venezia Giulia (8 hours).

2022 Lecturer at the seminar *Surveying techniques: Digital photogrammetry and laser scanning*, Order of Engineers, Province of Pordenone (4 hours).

2021 Lecturer at the seminar *Remote sensing techniques: From laser scanning to photogrammetry*, course on Hydrology (Bachelor's degree in Environmental and Nature Sciences, University of Udine) by prof. F. Cazorzi, a.y. 2021/2022 (2 hours).

2019 – 2020 Lecturer at the seminar *Laser scanning: Principles, technologies and applications*, course on Geomatics (Bachelor's degree in Environmental and Nature Sciences, University of Udine) by prof. M. Sigura, a.y. 2018/ 2019, 2019/2020 and 2020/2021 (2 hours).

Thesis supervisor and co-supervisor

Supervisor of 9 Bachelor's Theses in Civil and Environmental Engineering.

Co-supervisor of 2 Master's Theses in Civil Engineering, 2 Master's Theses in Environmental and Territorial Engineering and 3 Master's Theses in Electronic Engineering, 12 Bachelor's Theses in Civil Engineering.

Linguistic skills

Italian, native speaker.

English, *First Certificate in English* – level B2.

German, *ÖSD* certificate – level B2.

Software skills

Programming languages: MATLAB, Python.

Point cloud and image processing software: 3DF Zephyr, Agisoft Metashape, TerraScan, Heron Desktop, Stonex GO*post*, CloudCompare, JRC 3D Reconstructor, Leica Cyclone Register 360.

GIS software: QGIS, Global Mapper.

Topographic survey and GNSS processing software: MicroSurvey STAR*NET, Leica Infinity, Leica Geo Office.

CAD software: Bentley Microstation.

Video editing software: Vegas Pro.

Microsoft Office (Word, Excel, PowerPoint), LaTex.

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV.

Udine, December 30, 2024

Eleonora Matel