EUROPEAN CURRICULUM VITAE FORMAT

PERSONAL INFORMATION

Name	**GIOVANNA SONA**
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WORK EXPERIENCE

• Dates (from - to)	October 2024 – today
• Name and address of the employer	Università degli Studi di Milano
• Type of business or sector	University
• Occupation or position held	**Associate Professor (CEAR-04/A – Geomatica)** at Dipartimento di Scienze Agrarie e Ambientali
• Main activities and responsibilities	Research activities in Remote Sensing, Photogrammetry, Drone surveys, Image Analysis, GIS, Cartography. Teaching activities : Remote Sensing for Agriculture, GIS
• Dates (from - to)	October 1998 – September 2024
• Name and address of the employer	Politecnico di Milano
• Type of business or sector	University
• Occupation or position held	**Researcher (ICAR/06)** at Department of Civil and Environmental Engineering – Sector Geodesy and Geomatics
• Main activities and responsibilities	Research activities in Remote Sensing, Photogrammetry, Drone surveys, Image Analysis, GIS, Cartography. Teaching activities in SSD ICAR06 (see skills and competencies)
• Dates (from - to)	1996 – 1998
• Name and address of the employer	CNR - Istituto di Ricerca sul Rischio Sismico – via Ampere, Milano
• Type of business or sector	Research Institute
• Occupation or position held	**Researcher**
• Main activities and responsibilities	Researches on Earth Gravity Field modelling, Determination of gravimetric geoid (local and global) models and digital terrain model data integration.
• Dates (from - to)	1988 – 1990
• Name ad address of the employer	AGIP S.p.A – San Donato Milanese - MI
• Type of business or sector	National Oil Company
• Occupation or position held	**Researcher at Reservoir Modelling Section (MODL)**
• Main activities and responsibilities	Reservoir modelling: testing, applying and teaching numerical models applied to fluyd dynamics in of gas and oil in porous media. Long training periods abroad (Canada and France).

EDUCATION AND TRAINING

• Dates (from - to)	1991 – 1994
• Name and type of organisation	Politecnico di Milano
• Principal subjects/occupational skills covered	Researches on Gravity Field modelling; development of new mathematic methods and software packages for GF computation. Title of the PhD Thesis: “La determinazione dei modelli globali di campo gravitazionale anomalo” (On the determination of global models of the anomalous gravitational field)
• Title of qualification awarded	**PhD in Geodetic and Topographic Science**
• Dates (from - to)	1981 - 1986
• Name and type of organisation	Università degli Studi di Milano

• Principal subjects/occupational skills covered	Theoretical and experimental Physics. Thesis topic : use of principal component analysis to identify the sources of particulate pollutants, by using air filtered samples, analysed with X-ray induced emission technique. Title of the thesis : Study of dust pollutants in different towns of Sicily, through Particle Induced X-Ray Emission technique (PIXE)), developed at CISE (ENEL research center) –Segrate (MI)
• Title of qualification awarded	**Graduate in Physics (with honours)**

PERSONAL SKILLS AND COMPETENCES

MOTHER TONGUE	**ITALIAN**
OTHER LANGUAGES	**ENGLISH, GERMAN (BASIC)**

SCIENTIFIC SKILLS AND COMPETENCES

- Research interests: Remote Sensing, GIS, UAS survey, Multispectral and Thermal Image analysis, Precision Agriculture.
- Professor at Bachelor and Master courses of Politecnico di Milano since 2000, for the classes of Remote Sensing and Digital Image Analysis, GIS Applications, Digital Photogrammetry, Topography and Cartography (Master Courses of Environmental and Geomatic Engineering, and of Sustainable Architecture and Landscape Design). Professor at Master courses of Università degli Studi di Milano, classes of Remote Sensing for Agriculture, and GIS for landscape representation.
- Supervisor of Bachelor, Master and PhD theses on Remote Sensing and Photogrammetry.
- Teacher of courses and seminars at CNR, UniFI, UniMi, ASITA, SIFET on remote sensing and multisensors UAV surveys to produce 3D models, multiband and thermal orthomosaics, maps of vegetation indices and vegetation classification.

RELEVANT ROLES AND COMPETENCES

Coordination and administration of people, projects and budgets; at work, in voluntary work (for example culture and sports) and at home, etc.

- Early researches in the fields of Geodesy (global gravity field modelling, Italian geoid model computation), aerial and drone Photogrammetry, Remote Sensing and Image Analysis.
- Director of International Service for the Geoid (ISG) from 2014 al 2018, service of the International Association of Geodesy (IAG).
- Since 2011, development and use of vector/sensor unmanned systems (UAS) for environmental surveys and proximal sensing.
- Acquisition and analyses of UAS multispectral and thermal images to assess their geometric and radiometric quality, and their use in photogrammetric 3D modeling.
- Researches on UAS use in landscape and vegetation monitoring, with a focus on precision agriculture.
- 2012 - Planning of drones surveys and analysis of multispectral images for the identification and monitoring of alloctonous tree species in Adda River Park. Project 'Fruition of goods landscape in interactive environment' (FoGLIE POR FESR 2013)
- 2014 - Project ITACA (Innovazione, Tecnologie, Azioni per il Contrasto delle Alloctone) - realizzato dal Parco Adda Nord: experimental monitoring through multispectral UAV surveys to control alien tree species. Bando Cariplo.
- 2015 - Project BioMAN : Bio-Revaluation of the Chemical District of Mantova by Planning Non-Food Biomass Supply and its Upgrading to Bio-Products (Bando Cariplo 2014-0575)
- 2016 - In cooperation with Agriculture Department of University of Milan (DiSAA) works at precision agriculture projects with UAV surveys to integrate multispectral, thermal data and Sentinel2 images to map crop water stress and for crop row modelling (projects DIAnA, SteP).
- 2017 – 2019 - Project NutriPreciso – Coordinator of the research unit Partner Politecnico (headed by Dip. Agraria e Scienze ambientali dell'Università di Milano) PSR 2014-2020 'OPERAZIONE 1.2.01 PROGETTI DIMOSTRATIVI E AZIONI DI INFORMAZIONE' – D.D.S. N. 11297/2016 E D.D.S. N. 678/2017.– Progetto NUTRIPRECISO: Tecniche di irrigazione e concimazione di precisione in frutti-viticoltura e orticoltura
- Researches with CNR on planning and analyzing drones' surveys of thermal and multispectral images on crops and natural vegetation.
- Researches with CNR on the development of automatic processing of satellite optical images (Landsat and Sentinel2) for the detection of burned areas.
- High level expertise in GIS use, and software packages for Remote Sensing and Photogrammetric processing: Leica LPS, PCI OrthoEngine, Photomodeler, Agisoft MetaShape, Pix4D, ENVI, QGIS, ArcGIS, GEE, RStudio.

15 MOST RELEVANT PUBLICATIONS

In the last 10 years.

1 Bottaro, C., Finizio, M., Innangi, M., Varricchione, M., Carranza, M. L., & Sona, G. (2025). Ecological Insights from Above: Linking Habitat-Level NDVI Patterns with NDMI, LST and, Elevation in a Small Mediterranean City (Italy). *Land*, *15*(1), 57.

2 E. Piaser, A. Berton, G. Sona and P. Villa, (2025) Semiautomatic Workflow for Accurate LiDAR-Derived DSM Retrieval in Aquatic Scenarios via Water Surface Mapping, in *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 18, pp. 22673-22689.

3 Piaser, E., Berton, A., Caccia, M., Gallivanone, F., Sona, G., & Villa, P. (2025). Effects of functional type and angular configuration on reflectance anisotropy of aquatic vegetation in ultra-high resolution hyperspectral imagery. *International Journal of Remote Sensing*, *46*(3), 909-929.

4 Ortuani, B., Mayer, A., Bianchi, D., Sona, G., Crema, A., Modina, D., ... & Facchi, A. (2024). Effectiveness of management zones delineated from UAV and Sentinel-2 data for precision viticulture applications. *Remote Sensing*, *16*(4), 635.

5 Piaser E., Berton A., Bolpagni R., Caccia M., Castellani M. B., Coppi A., Dalla Vecchia A., Gallivanone F., Sona G., Villa P. (2023) Impact of radiometric variability on ultra-high resolution hyperspectral imagery over aquatic vegetation: preliminary results IEEE - Journal of Selected Topics in Applied Earth Observation and Remote Sensing

6 Sali M., Piaser E., Boschetti M., Brivio P.A. , Sona G., Bordogna G., Stroppiana D. (2021). A burned area mapping algorithm for sentinel-2 data based on approximate reasoning and region growing, Remote Sensing, 13(11), 2214

7 Stroppiana, D., Bordogna, G., Sali, M., ...Sona, G., Brivio, P.A. (2021) A fully automatic, interpretable and adaptive machine learning approach to map burned area from remote sensing, ISPRS International Journal of Geo-Information, 10(8), 546

8 Ronchetti, G.; Mayer, A.; Facchi, A.; Ortuani, B.; Sona, G (2020). Crop Row Detection through UAV Surveys to Optimize On-Farm Irrigation Management. Remote Sens., 12, 1967.

9 Ortuani, B.; Sona, G.; Ronchetti, G.; Mayer, A.; Facchi, A. (2019) Integrating Geophysical and Multispectral Data to Delineate Homogeneous Management Zones within a Vineyard in Northern Italy. Sensors , 19, 3974.

10 Tucci, G.; Parisi, E.I.; Castelli, G.; Errico, A.; Corongiu, M.; Sona, G.; Viviani, E.; Bresci, E.; Preti, F. (2019) Multi-Sensor UAV Application for Thermal Analysis on a Dry-Stone Terraced Vineyard in Rural Tuscany Landscape. ISPRS Int. J. Geo-Inf. , 8, 87.

11 Gini, R., Sona, G., Ronchetti, G., Passoni, D., & Pinto, L. (2018). Improving Tree Species Classification Using UAS Multispectral Images and Texture Measures. ISPRS International Journal of Geo-Information, 7(8), 315.

12 Stroppiana, D., Villa, P., Sona, G., Ronchetti, G., Candiani, G., Pepe, M., ... & Boschetti, M. (2018). Early Season Weed Mapping in Rice Crops Using Multi-spectral UAV Data. International Journal of Remote Sensing, 1-21.

13 Oxoli,D; Ronchetti,G.; Minghini, M.; Molinari,M.E.; Lotfian,M.; Sona,G.; Brovelli, M.A. (2018). Measuring Urban Land Cover Influence on Air Temperature through Multiple Geo-Data - The Case of Milan, Italy. ISPRS International Journal of Geo-Information, 7(11), 421.

14 Sona, G., Passoni, D., Pinto, L., Pagliari, D., Masseroni, D., Ortuani, B., & Facchi, A. (2016). Uav Multispectral Survey to Map Soil and Crop for Precision Farming Applications. ISPRS-International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 1023-1029.

15 Gini R., Passoni D, Pinto L., Sona G. (2014) Use of Unmanned Aerial Systems for multispectral survey and tree classification: a test in a park area of northern Italy. European Journal of Remote Sensing Volume 47, Issue 1, 10 May 2014, Pages 251-269

Autorizzo il trattamento dei miei dati personali ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 (Codice in materia di protezione dei dati personali) e sue successive modifiche e integrazioni, nonché del Regolamento UE 679/2016 (Regolamento Generale sulla Protezione dei dati o, più brevemente, RGPD).

Milano, 09.01.2024

Signature

