Maria Antonia Brovelli

Degree with honours in Physics, PhD in Geodesy and Cartography. She is a Professor of "GIS", "Earth Observation" and "The Copernicus Green Revolution for Sustainable Development" at Politecnico di Milano (PoliMI) and a member of both Schools of Doctoral Studies in "Data Science" and "Earth Observation" at La Sapienza University in Rome.

She has spent her entire career at the Polytechnic University of Milan, starting as a researcher and eventually becoming a Full Professor in 2010, where from 1997 to 2011 she was the Head of the Geomatics Laboratory of PoliMI (Campus Como) and from 2011 to 2016 she was the Vice-Rector of PoliMI for the Como Campus. Besides, from 2006 to 2011 she lectured GIS at the ETH of Zurich.

Currently, she is the coordinator of the Copernicus Academy Network for the PoliMI and the Head of the GEOLab (Geomatics and Earth Observation), an Interdepartmental Lab of PoliMI to which 7 Departments are contributing.

She is Vice President of the ISPRS Technical Commission on Spatial Information Science [1], a former member of ESA ACEO (Advisory Committee of Earth Observation Director of ESA's Earth Observation Programmes) [2]; co-chair of the United Nations Open GIS Initiative, former chair and current Advisory Board member of the UN-GGIM (Global Geospatial Information Management) Academic Network [3], mentor of the PoliMI Chapter of YouthMappers (PoliMappers) [4] , the curator of the geospatial series of the AI for Good, organized by ITU in partnership with 40 UN Sister Agencies [5]. In this last frame, she is organizing workshops and webinars related to GEOAI and Geospatial Foundation Models. She was one of the Directors of OSGeo in 2016-2017 [6]

Her research activity is in the field of geomatics and Earth Observation. Her interests have been various, starting from geodesy, radar-altimetry and moving later to GIS, webGIS, geospatial web platform, VGI, Citizen Science, Big Geo Data, Earth Observation, GEOAI, Geospatial Foundation Models (NASA-IBM FM or extensions of LLMs with geospatial app and models).

She is participating in and leading research on these topics within the frameworks of both national and international projects and scientific networks. One of her main interests is in Open-Source GIS, where she plays a leading worldwide role.

[1] https://www2.isprs.org/commissions/comm4
[2] ESA forms new Earth observation advisory group - Earth Online
[3] http://unggim.academicnetwork.org

[4] PoliMappers
[5] https://aiforgood.itu.int/about-us/discovery/ and scrolling down to GEOAI
[6] Board Election 2016 Results - OSGeo

Matrix overview

Scopus Author ID: https://www.scopus.com/authid/detail.uri?authorId=6602533891
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Google Scholar ID: https://scholar.google.it/citations?hl=it&user=qXBjE_AAAAAJ

Typology	#Documents	#Citations	#h index
WoS	138	1202	17
Scopus	206	1968	21
Google	474	3957	29

(27/01/2025)

Recent Research Projects

- 2016-2017 GEO team on Data Validation of Global Land Cover Datasets (within GEO SB-02-02: Global LandCover and User Engagement).
- 2016 - 2018 Erasmus + giCASES (Creating a University-Enterprise Alliance for a Spatially Enabled Society) - Leader of the Politecnico di Milan Unit.
- 2017 – Cariplo Foundation "Brezza" - Leader of the Politecnico di Milano Unit.
- 2018 - 2019 Cariplo Foundation "Mychonos" – Participant.
- 2018 ISPRS Capacity Building Initiative: "Capacity Building for High-Resolution Land Cover Inter-comparison and Validation" - Project Leader.
- 2017- 2020 Erasmus + "Geodesy and Geoinformatics for Sustainable Development in Jordan" (GEO4D) – Participant
- 2017 - 2020 MIUR (Ministry of Education, University and Research) National Project PRIN: "URBAN GEOmatics for Bulk Information Generation, Data Assessment and Technology Awareness" (URBAN GEO BIGDATA) – Project leader.
- 2018 – 2021 ESA "High Resolution Land Cover CCI +". Leader of the Politecnico di Milano Unit (Subcontractor)
- 2019-2020 INTERREG V-A project IT-CH 2014-2020 – "GIOCONDA" - ID 570702, Open data and public administration: design, data format transformation and geo-referencing. Participant.
- 2019-2021 INTERREG V-A project IT-CH 2014-2020 – "INSUBRIPARKS" - ID 605472, Database and applications design for the Insubric parks monitoring and touristic promotion. Leader of the Politecnico di Milano Unit.
- 2019- 2021 INTERREG V-A Italy Switzerland 2014-2020 – "SIMILE" - ID 523544, An Information System for the Integrated Monitoring of Insubric Lakes and their Ecosystem. Project Leader.
- 2019-2022 Erasmus+ project - "CIDMA" - Climate Change Induced Disaster Management in Africa. Leader of the Politecnico di Milano Unit.
- 2020-2023 Erasmus + project - "GIS4SCHOOLS" - Leader of the Politecnico di Milano Unit.
- 2021-2023 GEOMLIV MAE – Italy-Vietnam Cooperation - Geoinformatics and Earth Observation for landslide monitoring. Project Leader.
- 2021-2023 D-DUST - Data-driven moDelling of particUlate with Satellite Technology

aid – Fondazione Cariplo Project – Leader of the Project.

- 2021-2024 HARMONIA - Development of a Support System for Improved Resilience and Sustainable Urban areas to cope with Climate Change and Extreme Events based on GEOSS and Advanced Modelling Tools. H2020 Project – Participant.
- 2022-2025 Erasmus + project EUthmappers – open and collaborative mapping for pupils-led projects in Secondary Schools through innovative teaching methodology and fostering STEAM education and Environmental engagement. Leader of the Politecnico di Milano Unit.
- 2022-2025 "Copernicus 4 Schools - The Great Disaster Challenge" Work Programme 2020 of the Framework Partnership Agreement on Copernicus User Uptake (FPCUP) - Tier 2 - Specific Grant Agreement No. 20-2022/SI2.879178-SI2.879180/20, action No. 2021-2-08. Consultant of the Italian Responsible (ISPRA).
- 2022-2024 ASI I4DP_SCIENCE, Prima Call "Città Sostenibili" Accordo Attuativo n. 2022-30-HH.0 ASI – "Identificazione delle Local Climate Zones e studio della loro correlazione con la temperatura dell'aria nella Città Metropolitana di Milano tramite l'integrazione di dati geospaziali e tecnologie di Osservazione della Terra in ambiente Open Data Cube (LCZ-ODC)", CUP F43C22000350005 - Leader of the Project.
- 2023-2025 UDENE - Urban Development Explorations using Natural Experiments, HORIZON-EUSPA-2022-SPACE – Leader of the Politecnico di Milano Unit.

- 2023-2025 GEOAIR - Project of National Interest (PRIN) funded by the Italian Ministry of University and Research (MUR). Geo-Intelligence for improved air quality monitoring and analysis - Leader of the Politecnico di Milano Unit.
- 2024-2027 LCZ-UHI-GEO MAE – Italy-Vietnam Cooperation - Analysis of Local Climate Zones and Urban Heat Island using geomatic techniques (GIS and Earth Observation). Project Leader.
- 2024-2027 SpaceitUp! BANDO DI FINANZIAMENTO ASI DECRETO N. 687/2022 - DELIBERAZIONE N. 71/2022 – TEMATICA 15 ATTIVITÀ SPAZIALI, DI CUI ALLAVVISO MUR N. 341/2022 PER PARTENARIATI ESTESI – PROGRAMMA SPACE IT UP! APPROVATO CON DECRETO ASI N. 53/2024. Leader of WG 4, Spoke 7 "Zero emission society".

Awards

ISPRS President's Honorary Citation (2020).
Sol Katz Award – OSGeo (2015).

Editor

ISPRS International Journal of Geoinformation (Associate Editor in charge of the Area: Geospatial Artificial Intelligence).
Remote Sensing, Section 'Engineering Remote Sensing' Associate Editor.
International Journal of Digital Earth Editorial Board Member.

Papers (2022-2024)

- Cedeno Jimenez, Jesus Rodrigo, and Maria Antonia Brovelli. 2024. "Estimating Ground-Level NO2 Concentrations Using Machine Learning Exclusively with Remote Sensing and ERA5 Data: The Mexico City Case Study" Remote Sensing 16, no. 17: 3320. https://doi.org/10.3390/rs16173320

- Gianquintieri, L., Oxoli, D., Caiani, E. G., Brovelli, M. A. (2024). Implementation of a GEOAI model to assess the impact of agricultural land on the spatial distribution of PM2. 5 concentration. Chemosphere, 141438. doi.org/10.1016/j.chemosphere.2024.141438
- Gianquintieri, L., Oxoli, D., Caiani, E. G., Brovelli, M. A. (2024). State-of-art in modelling particulate matter (PM) concentration: a scoping review of aims and methods. Environment, Development and Sustainability, 1-23. doi.org/10.1007/s10668-024-04781-5
- Mahmoudi, H.; Camboim, S.; Brovelli, M.A. Development of a Voice Virtual Assistant for the Geospatial Data Visualization Application on the Web. ISPRS Int. J. Geo-Inf. 2023, 12, 441. https://doi.org/10.3390/ijgi12110441
- Moreno-Sanchez R., Brovelli M.A. Free and open source software for geospatial applications (FOSS4G) (2023) The Routledge Handbook of Geospatial Technologies and Society, pp. 246 - 255, DOI: 10.4324/9780367855765-21
- Tran, A.V.; Brovelli, M.A.; Ha, K.T.; Khuc, D.T.; Tran, D.N.; Tran, H.H.; Le, N.T. Land Subsidence Susceptibility Mapping in Ca Mau Province, Vietnam, Using Boosting Models. ISPRS Int. J. Geo-Inf. 2024, 13, 161. https://doi.org/10.3390/ijgi13050161
- Vavassori, A., Oxoli, D., Venuti, G., Brovelli, M. A., Mohamed, A. B. E. A., Moazzam, A., Siciliani de Cumis, M., Sacco, P., Tapete, D.: (2024). PRISMA Hyperspectral Satellite Imagery Application to Local Climate Zones Mapping. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XLVIII-1-2024, 643–648, https://doi.org/10.5194/isprs-archives-XLVIII-1-2024-643-2024
- Vavassori, A., Oxoli, D., Venuti, G., Brovelli, M.A., Siciliani De Cumis, M., Sacco, P., and Tapete, D. (2024). A Combined Remote Sensing and GIS-Based Method for Local Climate Zone Mapping Using PRISMA and Sentinel-2 Imagery. International Journal of Applied Earth Observation and Geoinformation, 131, 103944. https://doi.org/10.1016/j.jag.2024.103944.
- Xu, Q., Yordanov, V., Amici, L., & Brovelli, M. A. (2024). Landslide susceptibility mapping using ensemble machine learning methods: a case study in Lombardy, Northern Italy. International Journal of Digital Earth, 17(1). https://doi.org/10.1080/17538947.2024.2346263
- Amieva, J.F., Oxoli, D., Brovelli, M.A. (2023). Machine and Deep Learning Regression of Chlorophyll-a Concentrations in Lakes Using PRISMA Satellite Hyperspectral Imagery. Remote Sensing, 15(22), 5385. https://doi.org/10.3390/rs15225385
- Bratic, G., Oxoli, D., & Brovelli, M. A. (2023). Map of Land Cover Agreement: Ensambling Existing Datasets for Large-Scale Training Data Provision. Remote Sensing, 15(15), 3774. https://doi.org/10.3390/rs15153774
- Cedeno Jimenez, Jesus Rodrigo, and Maria Antonia Brovelli. 2023. "NO2 Concentration Estimation at Urban Ground Level by Integrating Sentinel 5P Data and ERA5 Using Machine Learning: The Milan (Italy) Case Study" Remote Sensing 15, no. 22: 5400. https://doi.org/10.3390/rs15225400
- Cedeno Jimenez, Jesus Rodrigo, Angelly de Jesus Pugliese Viloria, and Maria Antonia Brovelli. 2023. "Estimating Daily NO2 Ground Level Concentrations Using Sentinel-5P and Ground Sensor Meteorological Measurements" ISPRS International Journal of Geo-Information 12, no. 3: 107. https://doi.org/10.3390/ijgi12030107
- Gianquintieri, L., Oxoli, D., Caiani, E. G., & Brovelli, M. A. (2023). Land use influence on ambient PM2. 5 and ammonia concentrations: Correlation analyses in the Lombardy region, Italy. AGILE: GIScience Series, 4, 26. https://doi.org/10.5194/agile-giss-4-26-2023
- Puche, M.; Vavassori, A.; Brovelli, M.A. Insights into the Effect of Urban Morphology and Land Cover on Land Surface and Air Temperatures in the Metropolitan City of Milan (Italy)

Using Satellite Imagery and In Situ Measurements. Remote Sens. 2023, 15, 733. https://doi.org/10.3390/rs15030733

o Truong, X. Q., Tran, N. D., Dang, N. H. D., Do, T. H., Nguyen, Q. D., Yordanov, V., Brovelli, M.A. & Khuc, T. D. (2023). WebGIS and Random Forest Model for Assessing the Impact of Landslides in Van Yen District, Yen Bai Province, Vietnam. In: Vo, P.L., Tran, D.A., Pham, T.L., Le Thi Thu, H., Nguyen Viet, N. (eds) Advances in Research on Water Resources and Environmental Systems. GTER 2022. Environmental Science and Engineering. Springer, Cham. https://doi.org/10.1007/978-3-031-17808-5_27

o Truong, X.Q., Dang, N.H.D, Do, T.H., Tran, N.D., Do, T.T.N, Yordanov, V., Brovelli, M.A., Khuc, T.D. (2023). Random Forest Analysis of Land Use and Land Cover Change Using Sentinel-2 Data in Van Yen, Yen Bai Province, Vietnam. In Advances in Geospatial Technology in Mining and Earth Sciences. Environmental Science and Engineering. Springer, Cham. https://doi.org/10.1007/978-3-031-20463-0_27

o Yordanov, V., Truong, Q.X., and Brovelli, M.A. (2023). Estimating Landslide Surface Displacement by Combining Low-Cost UAV Setup, Topographic Visualization and Computer Vision Techniques. Drones 7, 2, 85. https://doi.org/10.3390/drones7020085

o Amici, L., Yordanov, V., Oxoli, D., and Brovelli, M. A. (2022). Monitoring Landslide Displacements Through Maximum Cross-Correlation of Sentinel-2 Satellite Images. In Symposium GIS Ostrava 2022 Earth Observation for Smart City and Smart Region (pp. 1-5). VSB-Technical University of Ostrava. [pdf]

o Amici, L., Yordanov, V., Oxoli, D., Truong, X.Q., Brovelli, M.A. (2022). MONITORING LANDSLIDE DISPLACEMENTS THROUGH MAXIMUM CROSS-CORRELATION OF SATELLITE IMAGES. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XLVIII-4/W1-2022, 27-34, doi.org/10.5194/isprs-archives-XLVIII-4-W1-2022-27-2022. [pdf]

o Bratic, G. & Brovelli, M.A. (2022) Crowdsourcing for deforestation detection in the Amazon. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLIII-B4-2022, 231–238, doi.org/10.5194/isprs-archives-XLIII-B4-2022-231-2022, 2022. [pdf]

o Bratic, G.; Carrion, D.; Cannata, M.; Rogora, M.; Strigaro, D. & Brovelli, M.A. (2022) Lake water quality monitoring tools. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLIII-B4-2022, 599–606, doi.org/10.5194/isprs-archives-XLIII-B4-2022-599-2022, 2022. [pdf]

o Cedeno Jimenez, J. R., Zhao, P., Mansourian, A., and Brovelli, M. A.: Geospatial Blockchain: review of decentralized geospatial data sharing systems, *AGILE GIScience Ser.*, 3, 29, doi.org/10.5194/agile-giss-3-29-2022, 2022. [pdf]

o Lotfian, M., Ingensand, J., and Brovelli, M. A.: AN APPROACH FOR REAL-TIME VALIDATION OF THE LOCATION OF BIODIVERSITY OBSERVATIONS CONTRIBUTED IN A CITIZEN SCIENCE PROJECT, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XLVIII-4/W1-2022, 271–278, https://doi.org/10.5194/isprs-archives-XLVIII-4-W1-2022-271-2022, 2022.

o Obukhov, T. and Brovelli, M. A.: DEFINING A METHODOLOGY FOR INTEGRATING SEMANTIC, GEOSPATIAL, AND TEMPORAL TECHNIQUES FOR CONFLICT ANALYSIS, *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLIII-B4-2022, 155–161, doi.org/10.5194/isprs-archives-XLIII-B4-2022-155-2022, 2022. [pdf]

o Oxoli, D., and Brovelli, M. A. (2022). VIRTUAL TOOLS ECOSYSTEM FOR PERIURBAN GREEN AREAS MONITORING AND PROMOTION: OUTCOMES AND OUTLOOKS OF THE INSUBRIPARKS PROJECT. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 48(4), 137-142. doi.org/10.5194/isprs-archives-XLVIII-4-W5-2022-137-2022. [pdf]

- Oxoli, D., Pessina, E., and Brovelli, M. A. (2022). Geo Collector Bot: a Telegram-Based Open Toolkit to Support Field Data Collection. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 48, 351-356. doi.org/10.5194/isprs-archives-XLVIII-4-W1-2022-351-2022. [pdf]
- Oxoli, D., and Brovelli, M. A. (2022). Open Data and Tools for Multispectral Satellite Analysis of Desert Sand Dunes Migration: Case Studies in the MENA Region. In Applications of Space Techniques on the Natural Hazards in the MENA Region (pp. 31-50). Springer, Cham. DOI: 10.1007/978-3-030-88874-9_3.
- Oxoli, D., Vavassori, A., Cedeno Jimenez, J. R., and Brovelli, M. A.: OPEN DATA CUBE APPLICATION TO USER-GENERATED GEODATA: VISITORS TURNOUT INVESTIGATION IN THE INSUBRIA NATURAL PARKS, *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLIII-B4-2022, 267–272, doi.org/10.5194/isprs-archives-XLIII-B4-2022-267-2022, 2022. [pdf]
- Pirotti, F., Piragnolo, M., Yoshimura, M., Hernandez, J. P., Brovelli, M. A., Leblon, B., and Yamashita, M.: ISPRS-SHY – OPEN DATA COLLECTOR FOR SUPPORTING GROUND TRUTH REMOTE SENSING ANALYSIS, *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLIII-B5-2022, 45–50, doi.org/10.5194/isprs-archives-XLIII-B5-2022-45-2022, 2022. [pdf]
- Vavassori, A., Oxoli, D., and Brovelli, M. A. (2022). Population Space–Time Patterns Analysis and Anthropic Pressure Assessment of the Insubric Lakes Using User-Generated Geodata. ISPRS International Journal of Geo-Information. 2022; 11(3):206. https://doi.org/10.3390/ijgi11030206 [pdf]
- Vavassori, A., Pugliese, A., Brovelli, M.A. (2022). Using open data to reveal factors of urban susceptibility to natural hazards and man-made hazards: case of Milan and Sofia. GeoScape, 16(2), 93-107. https://doi.org/10.2478/geosc-2022-0008.
- Yordanov, V., Biagi, L., Truong, X. Q., and Brovelli, M. A. (2022). LANDSLIDE SURVEYS USING LOW-COST UAV AND FOSS PHOTOGRAMMETRIC WORKFLOW, *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLIII-B2-2022, 493–499, doi.org/10.5194/isprs-archives-XLIII-B2-2022-493-2022 [pdf]
- Yordanov, V., Truong, X. Q., Pham, T.T.T., Khuc, T.D., & Brovelli, M. A. (2022). Open and collaborative tools for disaster management and risk reduction. *Vietnam Journal of Hydrometeorology*, 3(12), 33-38. [pdf]
- Zhang, Y., Zhou, Q., Brovelli, M. A., & Li, W. (2022). Assessing OSM building completeness using population data. *International Journal of Geographical Information Science*, 36(7), 1443–1466. doi.org/10.1080/13658816.2021.2023158. [pdf]
- Zhao, P., Cedeno Jimenez, J. R., Brovelli, M. A., and Mansourian, A.: Towards geospatial blockchain: A review of research on blockchain technology applied to geospatial data, *AGILE GIScience Ser.*, 3, 71, doi.org/10.5194/agile-giss-3-71-2022, 2022.[pdf]