



## Gaetano Settembre

PhD Candidate in Computer Science and Mathematics  
University of Bari Aldo Moro

✉ [gaetanosettembre@gmail.com](mailto:gaetanosettembre@gmail.com) | [gaetanosettembre.github.io](https://github.com/gaetanosettembre)

📍 Gravina in Puglia, 70024, Bari, Italy

### WORK AND ACADEMIC EXPERIENCE

#### • Planetek Italia S.r.l.

Nov 2022 - Sep 2023

*Visiting Researcher*

Bari, Italy

- Collaborated with research and engineering teams to integrate data-driven and machine learning approaches for Earth Observation applications.
- Designed and developed methodologies for the analysis of PRISMA (PRecursore IperSpettrale della Missione Applicativa) hyperspectral imagery [C.4, C.5].
- Contributed to the definition, prototyping, and implementation of a land cover change detection framework in wildfire-affected areas using PRISMA hyperspectral data [J.2].

#### • Institute of Crystallography - CNR

Oct 2021 - Mar 2022

*Academic Internship*

Bari, Italy

- Designed and implemented ETL processes for crystallographic data ingestion from open-source databases.
- Trained, evaluated, and optimized machine learning models for crystal system classification (multi-class task).
- Contributed to the deployment of trained models and the development of the web platform *CrystalMELA* (Crystallography MachinE LeArning) [J.4].

#### • SER&Practices S.r.l.

Nov 2018 - Apr 2019

*Academic Internship*

Bari, Italy

- Designed and developed "serious games" based on the Red Team vs. Blue Team approach.
- Conducted penetration testing and vulnerability assessments to identify and mitigate security flaws.
- Performed data collection and analysis (e.g., logs, alerts), producing security reports using IBM QRadar SIEM.

### EDUCATION

#### • PhD Program in Computer Science and Mathematics

Oct 2022 - Oct 2025

*University of Bari Aldo Moro, Department of Mathematics*

Bari, Italy

- PhD scholarship awarded under D.M. 352/22 in collaboration with Planetek Italia S.r.l., Curriculum Mathematics (ex. MAT/08, now MATH-05/A).
- Research topics: low-rank approximation models, NMF variants, spatial regularization, deep subspace learning models (DeepNMF, Autoencoders), and Earth Observation applications.
- Thesis title: "Low-dimensional Learning Models for Hyperspectral Data Analysis in Environmental Monitoring".
- Supervisor(s): Prof. Nicoletta del Buono (academic sup.), Dr. Nicolò Taggio (industrial sup.)

#### • Short Master - Generative AI: From Theory to Practice

Oct 2025 - Present

*University of Bari Aldo Moro, Department of Computer Science*

Bari, Italy

- Postgraduate Short Master (I Level), 100 hours (4 CFU), focusing on theoretical and practical foundations of Generative Artificial Intelligence.
- Main topics: Transformer architectures and attention mechanism, Large Language Models (LLMs), advanced prompt techniques (Chain-of-Thought, Tree-of-Thought), fine-tuning and access to external knowledge via Retrieval Augmented Generation (RAG).

- Laboratory activities on prompt engineering, fine-tuning and application case studies in real contexts.
- **Master's Degree in Data Science (LM-91)** Oct 2019 - Mar 2022  
*University of Bari Aldo Moro, Department of Computer Science* Bari, Italy
  - Final grade: **Full mark with honors - 110/110 & Lode** (highest possible grade in the Italian system).
  - Thesis: "*Analisi di dati cristallografici e costruzione di modelli predittivi*". Supervisors: Prof. N. Del Buono; Dr. R. Rizzi; Dr. N. Corriero
- **Bachelor's Degree in Computer Science (L-31)** Sep 2015 - Apr 2019  
*University of Bari Aldo Moro, Department of Computer Science* Bari, Italy
  - Final grade: **107/110**
  - Thesis: "*Red Team vs Blue Team: Data Exfiltration in Government*". Supervisor: Prof. D. Caivano.

## SKILLS

- **Data Science & AI:** scikit-learn, pytorch, tensorflow, numpy, pandas, matplotlib, seaborn, Apache Spark, spaCy, NLTK, Knime, Weka, Orange, giotto-tda
- **Programming Languages:** Python, MATLAB, R
- **DevOps & Version Control:** Git, GitHub, GitLab CI/CD, Docker
- **Mathematical & Statistical Tools:** MATLAB Toolboxes, SciPy, R (tidyverse, caret)
- **Web Technologies:** HTML, CSS, JavaScript
- **Other Tools & Technologies:** QGIS, SNAP ESA, IBM QRadar, XAI tools (e.g., SHAP, Grad-CAM)
- **Research Skills:** Scientific writing, Literature and peer review, Experimental design, Data preprocessing, Model evaluation, Reproducible research

## SELECTED COURSES AND CERTIFICATIONS

All badges of verified achievements from IBM are available at the following link: [Credly profile](#)

- **University of Bari**, Short Master – Generative AI: From Theory to Practice Oct 2025 – Present
- **Summer School**, 6th Advanced Course on Data Science & Machine Learning (ACDL) Jun 2023
- **Spring School**, DeepLearn - 9th International School on Deep Learning Apr 2023
- **Politecnico of Bari**, Satellites Systems for Remote Sensing and Geolocation Oct 2022 - Jan 2023
- **Planetek Italia**, Processing of Remote Sensing Data Oct 2022
- **IBM**, Machine Learning with Python Apr 2022
- **IBM**, Deep Learning Essentials Apr 2022
- **IBM**, Data Analysis using Python Oct 2021
- **IBM**, Data Visualization using Python Oct 2021
- **IBM**, Data Science Methodologies Oct 2021
- **IBM**, Data Science Foundations - Level 1 and 2 (V2) Oct 2021
- **University of Bari**, Corso su Sicurezza e Tutela della salute dei lavoratori May 2020
- **Dati360.it - Legal Suite**, Basic Course GDPR Regulation 679/2016 Dec 2019

## PARTICIPATION IN NATIONAL AND INTERNATIONAL RESEARCH PROJECTS

---

- **MODA: Model-based and Data-Driven Methods for Multiscale Biological Systems** Mar 2025 - Present  
*Coordinator: Assist. Prof. Marta Menci (University Campus Biomedico Rome, Italy)*
  - Funded by Gruppo Nazionale Calcolo Scientifico - Istituto Nazionale di Alta Matematica (GNCS-INdAM). CUP: E53C24001950001.
  - Team: M. Menci, M. Biani, E. Onofri, S.G. De Benedictis, G. Gargano, G.S.
- **MBI: Marine Biomass Innovation** Oct 2022 - Present  
*Principal Investigator: Prof. Raymond Thomas (Western University Ontario, Canada)*
  - Funded by New Frontiers in Research Fund - Transformation Stream, Canada. NFRFT-2020-00452.
  - Local Team: Prof. N. Del Buono, Dr. F. Esposito, Dr. L. Selicato, G. Gargano, G.S.
- **Low-rank models and Optimization algorithms for Data Analysis** Mar 2024 - Mar 2025  
*Coordinator: Prof. Margherita Porcelli (University of Florence, Italy)*
  - Funded by Gruppo Nazionale Calcolo Scientifico - Istituto Nazionale di Alta Matematica (GNCS-INdAM). CUP: E53C23001670001.
  - Team: S. Bellavia, S. Bonettini, N. Del Buono, F. Esposito, B. Morini, A. Papini, L. Selicato, G. Gargano, F. Tudisco, F. Camellini, G. Malaspina, F. Marini, S. Portaro, G. Seraghiti, G.S., M. Silei, M. Yousefi

## CONFERENCE AND WORKSHOP ORGANIZATION

---

- **ASH: Applications and Systems for Healthcare** Mar 23-27, 2026. Thessaloniki, GR  
*International Technical Track* 
  - At 40th ACM/SIGAPP Symposium On Applied Computing (SAC 2026)
- **Innovative Medical image Processing with AI-driven preCision Technologies** Sep 15, 2025. Rome, IT  
*International Workshop (1st Edition)* 
  - At 23rd International Conference on Image Analysis and Processing (ICIAP 2025)
- **SOAP4Earth: Smart Observation And Preservation for Earth** Sep 10-12, 2025. Osaka, JP  
*International Invited Session (1st Edition)* 
  - At 29th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems (KES 2025)
- **Advanced Numerical Methods and Machine Learning Techniques in Applied Science** Sep 1, 2025. Trieste, IT  
*International Minisymposium (1st Edition)* 
  - At Biennial congress of the Italian Society of Applied and Industrial Mathematics (SIMAI 2025)
- **Mathematics for Artificial Intelligence and Machine Learning** Jan 29-31, 2025. Bari, IT  
*National UMI Group Workshop (3rd Edition)* 
  - At 28 and 29th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems (KES 2024, 2025)
- **LDTH: Leveraging Digital Twins in Healthcare** Sep 11-13, 2024. Seville, ES  
*International Invited Session (1st and 2nd Edition)* 
  - At 28 and 29th International Conference on Knowledge-Based and Intelligent Information & Engineering Systems (KES 2024, 2025)
- **PRIMO: Post-graduate Researches in Inverse Problems, ML, and Optimization** Sep 20-22, 2023. Bari, IT  
*National Workshop (3rd Edition)* 

## PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT, S=IN SUBMISSION, T=THESIS

- [J.1] **G. Settembre**, F. Esposito, N. Del Buono (2025). Advancing blind hyperspectral unmixing in remote sensing: comparing deep-inspired subspace learning methods. *Advanced Modeling and Simulation in Engineering Sciences*, vol. 12, pp. 30.
- [J.2] **G. Settembre**, N. Taggio, N. Del Buono, F. Esposito, P. Di Lauro, A. Aiello (2024). A Land Cover Change Framework Analyzing Wildfire-affected Areas in Bitemporal PRISMA Hyperspectral Images. *Mathematics and Computers in Simulation*, vol. 229, pp. 855-866.
- [J.3] S.G. De Benedictis, G. Gargano, **G. Settembre** (2024). Enhanced MRI brain tumor detection and classification via topological data analysis and low-rank tensor decomposition. *Journal of Computational Mathematics and Data Science*, vol. 13, pp. 100103.
- [J.4] N. Corriero, R. Rizzi, **G. Settembre**, N. Del Buono, D. Diacono (2023). CrystalMELA: a new crystallographic machine learning platform for crystal system determination. *Journal of Applied Crystallography*, vol. 56, pt. 2, pp. 409–419.
- [S.1] G. Gargano, **G. Settembre**, S.G. De Benedictis, N. Del Buono (2025). TopoMED: A Topological Deep Learning Framework for Enhancing Medical Image Classification. [In preparation]
- [C.1] C. Russo, **G. Settembre**, G. Gargano, M.S. de Biase, R. De Fazio (2025). AI in Pediatric Urology: Deep Learning-based Approach supporting Posterior Urethral Valves Diagnosis on VCUG Imaging. In *International Conference on Image Analysis and Processing (ICIAP 2025)*. Lecture Notes in Computer Science. [In press]
- [C.2] **G. Settembre**, G. Gargano, N. Del Buono (2025). Superpixel-based plastic litter detection in UAV hyperspectral imaging using spectral-textural features. In *International Conference on Knowledge Based and Intelligent information and Engineering Systems (KES 2025)*. Procedia Computer Science. [In press]
- [C.3] G. Gargano, **G. Settembre**, N. Del Buono (2025). AI-Driven Insights into Microbial Biomarkers for Colorectal Cancer Progression. In *International Conference on Knowledge Based and Intelligent information and Engineering Systems (KES 2025)*. Procedia Computer Science. [In press]
- [C.4] **G. Settembre**, N. Del Buono, F. Esposito, N. Taggio (2024). Deep NMF and Autoencoder: A Comparative Analysis for Hyperspectral Unmixing Using PRISMA Real Images. In *IGARSS 2024 - IEEE International Geoscience and Remote Sensing Symposium*. pp. 3708-3712.
- [C.5] **G. Settembre**, N. Taggio, N. Del Buono, A. Aiello, F. Esposito (2023). Low-rank hierarchical clustering of PRISMA hyperspectral images to identify burned areas. In *European Conference on Machine Learning and Knowledge Discovery in Databases. (ECML-PKDD 2023)*. Communications in Computer and Information Science, vol. 2135, pp. 412-423.
- [C.6] **G. Settembre**, N. Corriero, N. Del Buono, F. Esposito, R. Rizzi (2023). Machine Learning approaches for Predicting Crystal Systems: A brief Review and a case study. In *Int. conference on Machine Learning, Optimization, and Data Science (LOD 2023)*. Lecture Notes in Computer Science, vol 13810. pp. 93-107.

## PARTICIPATION AS SPEAKER AT NATIONAL AND INTERNATIONAL SCIENTIFIC MEETINGS

- **Oral Presentation** Sep 10-12, 2025, Osaka, JP  
*Int. Conf. on Knowledge Based and Intelligent information and Engineering Systems (KES)*
  - Talk title: " Superpixel-based plastic litter detection in UAV hyperspectral imaging using spectral-textural features"
- **Oral Presentation** Jul 15, 2025, Bari, IT  
*PhD Days 2023-2025*
  - Talk title: "Updates on low-rank models for the analysis of Earth Observation data"
- **Poster Presentation** Jan 29-31, 2025, Bari, IT  
*Math4AIML - Workshop on Mathematics for Artificial Intelligence and Machine Learning*
  - Poster title: "Spatial Informed Hierarchical Clustering for Hyperspectral Imagery via Total Variation"
- **Poster Presentation** Jul 11, 2024, Athens, GR  
*IGARSS 2024 - IEEE International Geoscience and Remote Sensing Symposium*
  - Poster title: "Deep NMF and Autoencoder: A Comparative Analysis for Hyperspectral Unmixing Using PRISMA Real Images"
- **Oral Presentation** Sep 18, 2023, Turin, IT  
*Eur. Conf. on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD)*
  - Talk title: "Low-rank hierarchical clustering of PRISMA hyperspectral images to identify burned areas" in MACLEAN: Workshop on Machine Learning for Earth Observation
- **Invited Speaker** Dec 21, 2023, Bari, IT  
*XMaths Workshop, Ed. 2023*

- Talk title: "Unlocking insights from the sky: low-rank methods in remote sensing"
- **Oral Presentation** Jul 06, 2023, Athens, GR  
*Int. Conf. on Numerical Analysis and Scientific Computation with Applications (NASCA)*
  - Talk title: "A low-rank based approximation framework for real world data integration"
- **Oral Presentation** Sep 18, 2022, Castiglione della Pescaia, IT  
*Int. Conf. on Machine Learning, Optimization and Data science (LOD)*
  - Talk title: "Advanced Machine Learning approaches for Predicting Crystal Systems"

## PROFESSIONAL MEMBERSHIPS

- **SIMAI**: Italian Society of Applied and Industrial Mathematics member Apr 2025 - Present
- **KBIES**: Knowledge-Based and Intelligent Engineering Systems Society member Mar 2025 - Present
- **IEEE**: IEEE Student & Geoscience and Remote Sensing Society (GRSS) member Jan 2024 - Present
- **INdAM-GNCS**: Gruppo Nazionale Calcolo Scientifico member Sep 2023 - Present
- **PRIMO**: Post graduate Researchers in Inverse problems, ML and Optimization member Dec 2022 - Present

## JOURNAL/CONFERENCE REVIEWING

ALL REVIEWS ARE VERIFIED AND AVAILABLE ON THE WOS/ORCID PROFILE

- Journal of Systems and Software ISSN: 1873-1228
- Scientific Reports ISSN: 2045-2322
- Discover Applied Sciences, formerly "SN Applied Sciences" ISSN: 3004-9261
- Journal of Computational Mathematics and Data Science ISSN: 2772-4158
- WSEAS Transactions on Business and Economics ISSN: 1109-9526
- Forum Geografi ISSN: 0852-0682
- Biomedical Signal Processing and Control ISSN: 1746-8108
- ACM/SIGAPP Symposium On Applied Computing SAC 2026
- IEEE International Joint Conference on Neural Networks IJCNN 2025
- International Conference on Image Analysis and Processing ICIAP 2025
- International Academic Conference on Optics and Photonics IACOP 2024
- International Conference on Knowledge-Based and Intelligent Information & Engineering System KES 2024, 2025

## ADDITIONAL INFORMATION

- **Languages**: Italian (Mother tongue), English (B1 - Intermediate level)
- **Driving licence**: AM, B

Gravina in Puglia, October 27, 2025

Gaetano Settembre

*In compliance with the GDPR and the Italian Legislative Decree no. 196 dated 30/06/2003, I hereby authorize you to use and process my personal details contained in this document.*