

# Gaetano Settembre

PHD STUDENT · COMPUTER SCIENCE AND MATHEMATICS

Department of Mathematics - University of Bari Aldo Moro, Bari, IT

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## Briefly

PhD Scholarship winner D.M. 352/22 in agreement with the company Planetek Italia Srl, for Curriculum 2 Mathematics (MAT/08), with theme bound by title: *"Low-rank models for the analysis of Earth Observation data focusing on coastal and marine environments"*. His doctoral research is supervised by Prof. Nicoletta del Buono (academic supervisor), Eng. Cristoforo Abbattista, and Dr. Nicolò Taggio (industrial supervisors). As part of his Ph.D. studies, he was a visiting researcher at the Remote Sensing Laboratory of the National Technical University of Athens.

## Education

### University of Bari Aldo Moro

PHD STUDENT IN COMPUTER SCIENCE AND MATHEMATICS

Bari, Italy

Oct 2022 -- Present

- Advisors: Prof. Nicolatta Del Buono, Eng. Cristoforo Abbattista, and Dr. Nicolò Taggio

### University of Bari Aldo Moro

MASTER'S DEGREE IN DATA SCIENCE (LM-91)

Bari, Italy

Oct 2019 -- Mar 2022

- Thesis: Analysis of crystallographic data and training of supervised predictive models
- Supervisors: Prof. Nicoletta Del Buono, Dr. Rosanna. Rizzi, and Dr. Nicola Corriero

### University of Bari Aldo Moro

BACHELOR'S DEGREE IN COMPUTER SCIENCE (L-31)

Bari, Italy

Sep 2015 -- Apr 2019

- Thesis: Red Team vs. Blue Team: Data Exfiltration in Government
- Advisor: Prof. Danilo Caivano

## Academic/Professional Experience

- 2024 - 2024 **Visiting PhD Student**, Remote Sensing Laboratory of the National Technical University of Athens, Greece
- 2022 - 2023 **Visiting Researcher**, Planetek Italia S.r.l., Bari, Italy
- 2021 - 2022 **Curricular Internship**, Institute of Crystallography c/o CNR, Bari, Italy
- 2018 - 2019 **Curricular Internship**, SER&Practices (SER&P), University of Bari, Italy

## Publications

- **G. Settembre**, G. Gargano, N. Del Buono. 2025. Superpixel-based plastic litter detection in UAV hyperspectral imaging using spectral-textural features. *Procedia Computer Science, Proceedings of 29th International Conference on Knowledge Based and Intelligent information and Engineering Systems (KES 2025)*, *Accepted, awaiting publication*.
- G. Gargano, **G. Settembre**, N. Del Buono. 2025. AI-Driven Insights into Microbial Biomarkers for Colorectal Cancer Progression. *Procedia Computer Science, Proceedings of 29th International Conference on Knowledge Based and Intelligent information and Engineering Systems (KES 2025)*, *Accepted, awaiting publication*.
- **G. Settembre**, F. Esposito, N. Del Buono. 2025. Advancing blind hyperspectral unmixing: exploiting subspace learning methods in remote sensing. *Advanced Modeling and Simulation in Engineering Sciences*. *Under review*.
- **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. 866-866.

- 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, p. 100103.
- **G. Settembre**, N. Del Buono, F. Esposito, N. Taggio. 2024. Deep NMF and Autoencoder: A Comparative Analysis for Hyperspectral Unmixing Using Prisma Real Images. *IGARSS 2024 - 2024 IEEE International Geoscience and Remote Sensing Symposium*, pp. 3708-3712.
- **G. Settembre**, N. Taggio, N. Del Buono, A. Aiello, F. Esposito. 2024. Low-rank hierarchical clustering of PRISMA hyperspectral images to identify burned areas. *Proceedings of European Conference on Machine Learning and Knowledge Discovery in Databases. ECML PKDD 2023. Communications in Computer and Information Science*, vol. 2135, pp. 412-423.
- 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.
- **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. *Proceedings of Machine Learning, Optimization, and Data Science. LOD 2022. Lecture Notes in Computer Science*, vol 13810. pp. 93-107.

## Presentations

\*presenting author

### TALKS/POSTER

- Winter 2025. *Spatial Informed Hierarchical Clustering for Hyperspectral Imagery via Total Variation*. 3rd Workshop of UMI Group Mathematics for Artificial Intelligence and Machine Learning, 29-31 Jan 2025, Bari, IT
- Summer 2024. *Deep NMF and Autoencoder: A Comparative Analysis for Hyperspectral Unmixing Using PRISMA Real Images*. *IGARSS 2024 - IEEE International Geoscience and Remote Sensing Symposium*, Athens, GR, 12 Jul 2024, Athens, GR
- Summer 2024. *Low-rank models for the analysis of Earth Observation data*. PhD Days 2024, 11 Jul 2024, Bari, IT
- Winter 2023. *Unlocking insights from the sky: Low-rank methods in Remote Sensing*. Invited talk: XMaths Workshop 2023, 21 Dec 2023, Bari, IT
- Autumn 2023. *Low-rank Hierarchical Clustering of PRISMA hyperspectral images to identify burned areas*. MACLEAN: Workshop on Machine Learning for Earth Observation @ECML/PKDD, 18 Sep 2023, Turin, IT
- Summer 2023. *Low-rank models for the analysis of Earth Observation data*. PhD Days 2023, 11 Jul 2023, Bari, IT
- Summer 2023. *A low-rank based approximation framework for real world data integration*. Numerical Analysis and Scientific Computation with Applications (NASCA), 06 Jul 2023, Athens, GR

### CONTRIBUTED PRESENTATIONS

- S.G. De Benedictis\*, G. Gargano, **G. Settembre**, 2025. *ROI Image Identification via Topological Data Analysis: A Case Study of Brain Tumor MRI*. Poster: 3rd Workshop of UMI Group Mathematics for Artificial Intelligence and Machine Learning, Bari, 29-31 Jan 2025
- S.G. De Benedictis\*, G. Gargano, **G. Settembre**, 2024. *ROI Image Identification via Topological Data Analysis: A Case Study of Brain Tumor MRI*. Poster: International Ph.D. Summer School Mathematics and Machine Learning for Image Analysis, Bologna, 4-12 Jun 2024
- S.G. De Benedictis, G. Gargano\*, **G. Settembre**, 2024. [TITLE POSTER]. Poster: BITS – Bioinformatics Italian Society 20th Annual Meeting, Trento, IT

## Organizing/Technical Program Committee

## ORGANIZER/CO-CHAIR:

Sep '25	<b>IMPACT: Innovative Medical image Processing with AI-driven preCision Technologies,</b> Workshop at ICIAP '25	Rome, IT
Sep '25	<b>Smart Observation And Preservation for Earth (SOAP4Earth),</b> Invited Session at KES '25	Osaka, JP
Sep '25	<b>Advanced Numerical Methods and Machine Learning Techniques in Applied Sciences,</b> Minisymposium at SIMAI '25	Trieste, IT
Jan '25	<b>3rd Workshop of UMI Group Mathematics for AI and Machine Learning (Math4AIML)</b>	Bari, IT
Sep '23	<b>3rd PRIMO Workshop</b> at Dept. of Mathematics, University of Bari	Bari, IT
Dec '22	<b>10th XMaths Workshop</b> at Dept. of Mathematics, University of Bari	Bari, IT

## TECHNICAL PROGRAM COMMITTEE (TPC):

Sep '25	<b>2nd Invited Session on Leveraging Digital Twins in Healthcare (LDTH 2025)</b> at KES '25	Osaka, IT
Sep '24	<b>Leveraging Digital Twins in Healthcare (LDTH 2024),</b> Invited Session at KES '24	Seville, ES

## Research Projects

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**Integrating MOdel-based and DAta-Driven Methods for Multiscale Biological Systems** CUP: E53C24001950001

COORDINATOR: ASSIST. PROF. MARTA MENCI (UNIVERSITY CAMPUS BIOMEDICO ROME, ITALY)

- Funded by Gruppo Nazionale Calcolo Scientifico - Istituto Nazionale di Alta Matematica (GNCS-INdAM)
- Team: M. Menci, M. Briani, E. Onofri, S.G. De Benedictis, G. Gargano, [G. Settembre](#)

**Low-rank models and Optimization algorithms for Data Analysis** CUP: E53C23001670001

COORDINATOR: PROF. MARGHERITA PORCELLI (UNIVERSITY OF FLORENCE, ITALY)

- Funded by Gruppo Nazionale Calcolo Scientifico - Istituto Nazionale di Alta Matematica (GNCS-INdAM)
- 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. Settembre](#), M. Silei, M. Yousefi

### Marine Biomass Innovation (MBI) project

PRINCIPAL INVESTIGATOR: PROF. RAYMOND THOMAS (WESTERN UNIVERSITY ONTARIO, CANADA)

- Local PI: Dr. Flavia Esposito and co-leader Prof. Nicoletta Del Buono (Department of Mathematics, Univesity of Bari Aldo Moro)
- Local Team: Prof. N. Del Buono, Dr. F. Esposito, Dr. L. Selicato, G. Gargano, [G. Settembre](#)

## Others

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*All reviews specified are verified and available on the Web of Science/ORCID profile*

## JOURNAL/CONFERENCE PEER REVIEWING

- Procedia Computer Science (ISSN: 1877-0509)
- Discover Applied Sciences (ISSN: 3004-9261), *formerly "SN Applied Sciences"*
- International Joint Conference on Neural Networks (IJCNN 2025)
- Journal of Computational Mathematics and Data Science (ISSN: 2772-4158)
- International Academic Conference on Optics and Photonics (IACOP 2024)
- International Conference on Knowledge-Based and Intelligent Information & Engineering Systems (KES 2024, 2025)
- WSEAS Transactions on Business and Economics (ISSN: 1109-9526)
- Forum Geografi (ISSN: 0852-0682)

## PROFESSIONAL MEMBERSHIPS

From 2025 **SIMAI**, Italian Society of Applied and Industrial Mathematics member

From 2024 **IEEE**, IEEE Student Member

From 2024 **IEEE**, IEEE Geoscience and Remote Sensing Society (GRSS) member

From 2023 **PRIMO Group**, Post graduate Researchers in Inverse problems, Machine learning and Optimization member

From 2023 **INdAM-GNCS**, Gruppo Nazionale Calcolo Scientifico member

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