

# Gaetano Settembre

PHD STUDENT · COMPUTER SCIENCE AND MATHEMATICS

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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 is currently 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**, 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

Sep '25	<b>2nd Invited Session on Leveraging Digital Twins in Healthcare</b> , TPC	Osaka, JP
Jan '25	<b>3rd Workshop of UMI Group Mathematics for AI and Machine Learning</b> , Local Staff	Bari, IT
Sep '24	<b>Invited Session on Leveraging Digital Twins in Healthcare</b> , TPC	Seville, ES
Sep '23	<b>3rd PRIMO Workshop</b> , Organizing Committee	Bari, IT
Dec '22	<b>10th XMaths Workshop</b> , Organizing Committee	Bari, IT

## Research Projects

## **Integrating MModel-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, University 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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### **PROFESSIONAL MEMBERSHIPS**

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

### **JOURNAL/CONFERENCE PEER REVIEWING**

- 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)
- WSEAS Transactions on Business and Economics (ISSN: 1109-9526)
- Forum Geografi (ISSN: 0852-0682)

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