

# 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

## Aademic/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. *International Workshops of ECML PKDD 2023, Turin, Italy, 2023, Revised Selected Papers, Part III in Communications in Computer and Information Science*, vol 2135 (IN PRESS).

- 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 Machine Learning, Optimization, and Data Science. LOD 2022. Lecture Notes in Computer Science*, vol 13810. pp. 93-107.

## Presentations

\* *presenting author*

### TALKS/POSTER

- 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**, 2024. Title of a poster presented by an undergrad I mentored. 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** 2014. Title of a poster presented by an undergrad I mentored. 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	<i>Osaka, JP</i>
Jan '25	<b>3rd Workshop of UMI Group Mathematics for AI and Machine Learning</b> , Local Staff	<i>Bari, IT</i>
Sep '24	<b>Invited Session on Leveraging Digital Twins in Healthcare</b> , TPC	<i>Seville, ES</i>
Sep '23	<b>3rd PRIMO Workshop</b> , Organizing Committee	<i>Bari, IT</i>
Dec '22	<b>10th XMaths Workshop</b> , Organizing Committee	<i>Bari, IT</i>

## Research Projects

### 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)

### Low-rank models and Optimization algorithms for Data Analysis

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

- Funded by Gruppo Nazionale Calcolo Scientifico - Istituto Nazionale di Alta Matematica (GNCS-INdAM). CUP: E53C23001670001
- Local Team: Prof. N. Del Buono, Dr. F. Esposito, Dr. L. Selicato, G. Gargano, G. Settembre

## Others

## 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

## PEER REVIEW

- 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)

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