University of Naples Federico II

Curriculum Vitae of

Matteo Ciotola

Contents

1 Generals

Contacts

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Scopus Metrics

- **h-index:** 8
- **citation:** 221
- **journal paper:** 10
- **conference paper:** 10

CV Summary

Matteo Ciotola is currently an Assistant Professor at the University of Naples Federico II, Naples, Italy and a member of the Research Image Processing Research Group (GRIP). He received his B.Sc. and M.Sc. degrees (*summa cum laude*) in Automation Engineering, and earned his Ph.D. in Information Technology and Electrical Engineering (ITEE) in 2024 from the same institution. From 2023 to 2025, he held a research fellowship at the University of Naples Federico II, Naples, Italy. In 2020, he completed a research traineeship at the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) in Montpellier, France, as part of the Erasmus+ Traineeship Program, conducting research at the Maison de la Télédétection. During his Ph.D., he also spent a research period (Nov 2022 – Jan 2023) at Université Bretagne Sud, Vannes, France, focusing on deep learning approaches for satellite image enhancement. In 2023, he was awarded the CNIT-GTTI Prof. Francesco Carassa Award for the best poster presentation in the field of Radar and Remote Sensing. In 2024, he received the "Best Paper presented by a Young Researcher" award at the IEEE Technologies for Defense and Security (TechDefense) conference. His research focuses on image processing for passive remote sensing data, particularly from multispectral and hyperspectral sensors. His work leverages artificial intelligence and deep learning to address key challenges in image fusion, super-resolution, and pansharpening. A key theme of his research is the design of training frameworks that allow convolutional neural networks to learn directly from real data, avoiding synthetic degradation and preserving spatial and spectral fidelity. He collaborates with six international research groups and has served as a Tutorial Speaker at both the IEEE GRSS IADF School 2022 and IEEE IGARSS 2023. He has authored ten peer-reviewed journal papers and presented ten contributions at international conferences. He also is participating in the Space It Up project funded by the Italian Space Agency. Dr. Ciotola serves as a reviewer for leading scientific journals including IEEE TGRS, IEEE JSTARS, IEEE GRSL, Information Fusion, ISPRS

Journal of Photogrammetry and Remote Sensing, MDPI Remote Sensing, and MDPI Sensors. He is also an active member of the technical program committees of major international conferences such as IEEE/CVF CVPR, ECCV, ICCV, EUSIPCO, and IGARSS. An IEEE member since 2022, he was appointed Guest Editor for a Special Issue of MDPI Remote Sensing in 2025. That same year, he also became Chair of the IEEE Italy Section Young Professionals Affinity Group. He has co-supervised several Master degree theses and served as a teaching assistant for the course Image Processing for Computer Vision.

Education

- **2024**: Ph.D. degree in Information Technology and Electrical Engineering at University of Naples Federico II. Tutors: Prof. G. Poggi
  Ph.D Thesis "Deep Learning-based Pansharpening and Super-Resolution of Remote Sensing Images".
- **2020**: Master Degree in Automation Engineering at University of Naples Federico II, *summa cum laude*. Tutor: Prof. G. Scarpa.
  Master thesis: "Deep Learning methods for super-resolution and cloud removal for Sentinel-2 images".
- **2018**: Bachelor Degree in Automation Engineering at University of Naples Federico II. Tutor: Prof. A. Botta.
  Master thesis: "Cloud-based environmental monitoring system for fire detection".

Professional Experience

- **April 2025 - today**: Assistant Professor in the Department of Electrical Engineering and Information Technology, University of Naples Federico II.

  Project: "Space It Up! - funded by the Italian Space Agency and the Ministry of University and Research - CUP: E63C24000220006" funded within the PNRR:

  - Spoke 3: Future imaging systems for microwave and optical remote sensing
  - Work Package 3.5: Key enabling technologies for optical imaging payloads on nano/cubesats
  - Task 3.5.3: AI-based fusion of optical images

  Duration 36 months.
- **November 2024 - April 2025**: Post-Doctoral Research Fellow in the Department of Electrical Engineering and Information Technology, University of Naples Federico II.

  Project: "Sistemi radar e di imaging per la sicurezza, la salute ed il monitoraggio dell'ambiente" - CUP: E54I19003690005"

  Duration 12 months.
- **November 2023 - October 2024**: Research Fellow in the Department of Electrical Engineering and Information Technology, University of Naples Federico II.

  Project: "Sistemi radar e di imaging per la sicurezza, la salute ed il monitoraggio dell'ambiente" - CUP: E54I19003690005"

  Duration 12 months.

Teaching Activities

- Academic year 2024-2025
  - Ph.D. Course of *Computer Vision* at University of Naples Parthenope (16 hours).
  - **Teaching Assistant**, Master Course of *Image Processing for Computer Vision* at University of Naples Federico II (34 hours).
- Academic year 2023-2024
  - **Teaching Assistant**, Master Course of *Image Processing for Computer Vision* at University of Naples Federico II (34 hours).
- Academic year 2022-2023
  - **Teaching Assistant**, Master Course of *Image Processing for Computer Vision* at University of Naples Federico II (34 hours).
- Academic year 2021-2022
  - **Teaching Assistant**, Master Course of *Image Processing for Computer Vision* at University of Naples Federico II (34 hours).
- Academic year 2020-2021
  - **Teaching Assistant**, Master Course of *Image Processing for Computer Vision* at University of Naples Federico II (34 hours).
- Co-tutoring of different Master thesis

2 Editorial Boards

Editorial Boards

- Guest Editor per MDPI Remote Sensing - Special Issue: "Revolutionizing Earth Observation: Convolutional Neural Networks Innovations in Remote Sensing and Environmental Monitoring", 2025

Reviewer Boards

- IEEE Transactions on Geoscience and Remote Sensing
- IEEE Geoscience and Remote Sensing Letters
- IEEE Journal of Selected Topics in Applied Earth
- MDPI Remote Sensing
- MDPI Sensors
- Elsevier Information Fusion
- Elsevier ISPRS Journal of Photogrammetry and Remote Sensing
- International Journal of Digital Earth
- Geo-spatial Information Science

3 Conference activities

Invited Session Organization

- IEEE 2025 IEEE International Workshop on Technologies for Defense and Security, TechDefense 2025. Organizer and Chairman of *Special Session #17: Young Researchers Activities in Technologies for Defense and Security*
- IEEE 2024 International Geoscience and Remote Sensing Symposium, IGARSS 2024. Organizer and Chairman of the Contributed Community Session *CCS.109: Super-resolution and pansharpening*

Chairman Activities

- IEEE 2025 International Geoscience and Remote Sensing Symposium, IGARSS 2025
- IEEE 2024 International Geoscience and Remote Sensing Symposium, IGARSS 2024
- IEEE 2023 International Geoscience and Remote Sensing Symposium, IGARSS 2023
- IEEE 2022 International Geoscience and Remote Sensing Symposium, IGARSS 2022

Speaker Activities

- IEEE 2025 International Geoscience and Remote Sensing Symposium, IGARSS 2025
- IEEE 2023 International Geoscience and Remote Sensing Symposium, IGARSS 2024
- IEEE 2024 International Workshop on Technologies for Defense and Security, TechDefense 2024.
- IEEE 2023 International Geoscience and Remote Sensing Symposium, IGARSS 2023
- IEEE 2022 International Geoscience and Remote Sensing Symposium, IGARSS 2022
- IEEE 2021 International Geoscience and Remote Sensing Symposium, IGARSS 2021

Tutorial Speaker Activities

- IEEE 2023 International Geoscience and Remote Sensing Symposium, IGARSS 2023. Title: *Pansharpening by convolutional neural networks*
- IEEE GRSS/IADF School on Computer Vision for Earth Observation. Title: *Image Fusion - Pansharpening by Convolutional Neural Network*

Reviewer Board

- IEEE 2025 International Geoscience and Remote Sensing Symposium, IGARSS 2025
- IEEE/CVF 2025 International Conference on Computer Vision, ICCV 2025
- IEEE/CVF 2025 Conference on Computer Vision and Pattern Recognition, CVPR 2025
- EURASIP 2025 European Signal Processing Conference, EUSIPCO 2025
- 2025 Workshop on Machine Learning for Earth Observation (n conjunction with the European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases - ECML/PKDD), MACLEAN 2025

- IEEE 2024 International Geoscience and Remote Sensing Symposium, IGARSS 2024
- IEEE 2023 International Geoscience and Remote Sensing Symposium, IGARSS 2023
- IEEE 2022 International Geoscience and Remote Sensing Symposium, IGARSS 2022
- IEEE 2021 International Geoscience and Remote Sensing Symposium, IGARSS 2021

4 Research Group Activities

Co-operation to Research Group activities

- Co-operation to the activities of Research Image Processing Research Group (GRIP) of University of Naples Federico II.

Collaboration with International Research Group

- University Parthenope of Naples, Naples, Italy - Results: international peer-reviewed journal papers and conference papers
- National Research Council - Institute of Methodologies for Environmental Analysis, CNR-IMAA, Tito, Italy - Results: international peer-reviewed journal papers and conference papers
- University of Extremadura, Cáceres Spain - Results: international peer-reviewed journal papers and conference papers
- University of University of Grenoble Alpes, Grenoble, France - Results: international peer-reviewed journal papers and conference papers
- Maxar Technologies, Westminster CO, USA - Results: international peer-reviewed conference papers *(to appear)*
- University of Montpellier, Montpellier, France - Results: international peer-reviewed conference papers *(to appear)*
- National Research Institute for Agriculture, Food and Environment (INRAE), Montpellier, France - Results: international peer-reviewed conference papers *(to appear)*
- French Agricultural Research Centre for International Development (CIRAD), Montpellier, France - Results: international peer-reviewed conference papers *(to appear)*

5 Awards and Memberships

- Winner of the "2024 Best Paper Presented by a Young Researcher" awarded by International Workshop on Technologies for Defense and Security (TechDefense) for the paper "Boosting Resolution of VHR Remote Sensing Images using CNN".
- Winner of "2023 Prof. Francesco Carassa Award" in Radar and Remote Sensing field, awarded by Gruppo Telecomunicazioni e Tecnologie dell'Informazione (GTTI) and National Inter-University Consortium for Telecommunications (CNIT) for the poster presentation "CNN-based Unsupervised Pansharpening".
- IEEE Member, since 2022
- IEEE GRSS Member, since 2022

- IEEE SPSS Member, since 2024

6 Volunteering Activities

- Chair, IEEE Italy Section Young Professionals Affinity Group

7 Research Activities Summary

The research activities of Matteo Ciotola are centered on the development of advanced image processing techniques for passive remote sensing data, with a particular focus on multispectral and hyperspectral imaging. His work primarily concerns the design of deep learning-based methodologies for multi-source image fusion, including super-resolution, pansharpening, and co-registration of data acquired by heterogeneous sensors.

A significant part of his research is devoted to the development of unsupervised training frameworks that enable convolutional neural networks to be trained directly on real satellite data. This approach avoids the use of synthetically degraded references and ensures the preservation of both spatial and spectral fidelity. In addition to algorithmic design, his work encompasses the integration of these and other solutions into benchmark frameworks, in collaboration with several international research teams.

8 List of Publications

International Journals

[1] **Ciotola, M.**, Guarino, G., Mazza, A., Poggi, G., Scarpa, G., 'A comprehensive benchmarking framework for sentinel-2 sharpening: Methods, dataset, and evaluation metrics', *Remote Sensing*, vol. 17, no. 12, 2025.

[2] Guarino, G., **Ciotola, M.**, Vivone, G., Poggi, G., Scarpa, G., 'Zero-shot hyperspectral pansharpening using hysteresis-based tuning for spectral quality control', *IEEE Transactions on Geoscience and Remote Sensing*, pp. 1–1, 2025.

[3] **Ciotola, M.**, Guarino, G., Scarpa, G., 'An unsupervised cnn-based pansharpening framework with spectral-spatial fidelity balance', *Remote Sensing*, vol. 16, no. 16, p. 3014, 2024.

[4] **Ciotola, M.**, Guarino, G., Vivone, G., Poggi, G., Chanussot, J., Plaza, A., Scarpa, G., 'Hyperspectral pansharpening: Critical review, tools, and future perspectives', *IEEE Geoscience and Remote Sensing Magazine*, 2024.

[5] **Ciotola, M.**, Poggi, G., Scarpa, G., 'Unsupervised deep learning-based pansharpening with jointly enhanced spectral and spatial fidelity', *IEEE Transactions on Geoscience and Remote Sensing*, vol. 61, pp. 1–17, 2023.

[6] **Ciotola, M.**, Scarpa, G., 'Fast full-resolution target-adaptive cnn-based pansharpening framework', *Remote Sensing*, vol. 15, no. 2, p. 319, 2023.

[7] Guarino, G., **Ciotola, M.**, Vivone, G., Poggi, G., Scarpa, G., 'Pca-cnn hybrid approach for hyperspectral pansharpening', *IEEE Geoscience and Remote Sensing Letters*, vol. 20, pp. 1–5, 2023.

[8] Guarino, G., **Ciotola, M.**, Vivone, G., Scarpa, G., 'Band-wise hyperspectral image pansharpening using cnn model propagation', *IEEE Transactions on Geoscience and Remote Sensing*, vol. 62, pp. 1–18, 2023.

[9] **Ciotola, M.**, Vitale, S., Mazza, A., Poggi, G., Scarpa, G., 'Pansharpening by convolutional neural networks in the full resolution framework', *IEEE Transactions on Geoscience and Remote Sensing*, vol. 60, pp. 1–17, 2022.

[10] Scarpa, G., **Ciotola, M.,** 'Full-resolution quality assessment for pansharpening', *Remote Sensing*, vol. 14, no. 8, p. 1808, 2022.

International Conferences

[1] Guarino, G., **Ciotola, M.**, Scarpa, G., 'A spectral-preserving zero-shot technique for hyperspectral pansharpening', in *Image Analysis*, J. Petersen and V. A. Dahl, Eds., Cham: Springer Nature Switzerland, 2025, pp. 77–91.

[2] **Ciotola, M.**, Guarino, G., Poggi, G., Scarpa, G., 'Balancing spectral and spatial quality in cnn-based unsupervised pansharpening', in *IGARSS 2024-2024 IEEE International Geoscience and Remote Sensing Symposium*, IEEE, 2024, pp. 1091–1094.

[3] **Ciotola, M.**, Guarino, G., Vivone, G., Chanussot, J., Plaza, A., Scarpa, G., 'Hyperspectral pansharpening: Review and future perspectives', in *IGARSS 2024-2024 IEEE International Geoscience and Remote Sensing Symposium*, IEEE, 2024, pp. 1231–1234.

[4] **Ciotola, M.**, Poggi, G., Scarpa, G., 'Boosting resolution of vhr remote sensing images using cnn', in *2024 IEEE International Workshop on Technologies for Defense and Security (TechDefense)*, IEEE, 2024, pp. 200–205.

[5] Guarino, G., **Ciotola, M.**, Poggi, G., Vivone, G., Scarpa, G., 'Hybrid gsa-cnn method for hyperspectral pansharpening', in *IGARSS 2024-2024 IEEE International Geoscience and Remote Sensing Symposium*, IEEE, 2024, pp. 901–904.

[6] **Ciotola, M.**, Guarino, G., Mazza, A., Poggi, G., Scarpa, G., 'Pansharpening by efficient and fast unsupervised target-adaptive cnn', in *IGARSS 2023-2023 IEEE International Geoscience and Remote Sensing Symposium*, IEEE, 2023, pp. 5579–5582.

[7] Guarino, G., **Ciotola, M.**, Vivone, G., Poggi, G., Scarpa, G., 'An unsupervised cnn-based hyperspectral pansharpening method', in *IGARSS 2023-2023 IEEE International Geoscience and Remote Sensing Symposium*, IEEE, 2023, pp. 5982–5985.

[8] Mazza, A., **Ciotola, M.**, Poggi, G., Scarpa, G., 'Synergic use of sar and optical data for feature extraction', in *IGARSS 2023-2023 IEEE International Geoscience and Remote Sensing Symposium*, IEEE, 2023, pp. 2061–2064.

[9] **Ciotola, M.**, Martinelli, A., Mazza, A., Scarpa, G., 'An adversarial training framework for sentinel-2 image super-resolution', in *IGARSS 2022-2022 IEEE International Geoscience and Remote Sensing Symposium*, IEEE, 2022, pp. 3782–3785.

[10] **Ciotola, M.**, Ragosta, M., Poggi, G., Scarpa, G., 'A full-resolution training framework for sentinel-2 image fusion', in *2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS*, IEEE, 2021, pp. 1260–1263.

Books and Chapters

[1] **Ciotola, M.**, Scarpa, G., 'Unsupervised pansharpening using convnets', in *Super-Resolution for Remote Sensing*, M. Kawulok, J. Kawulok, B. Smolka and M. E. Celebi, Eds. Cham: Springer Nature Switzerland, 2024, pp. 233–278.

Ph.D Thesis

[1] **Ciotola, M.** , "Deep Learning-based Pansharpening and Super-Resolution of Remote Sensing Images", 2024.