sysPERSONAL INFORMATION

Alvise Ferrari

Sex M | Date of birth 23/06/1992 | Nationality Italian

CONTACT INFORMATION

ferrarialvise@gmail.com

alvise.ferrari@uniroma1.it

alviseferrari@pec.it

(+39) 3805807044

CANDIDATE SUMMARY

Specializing in remote sensing and satellite imagery, I bring extensive expertise in processing and analyzing raw data to solve complex problems. My recent accomplishments include the development of automatic software for detection and estimation of methane emissions from hyperspectral satellite data and the development of a generalized and automatic segmentation system using ResUNet for accurate field boundary delineation. I have comprehensive training in SAR technology and SAR data preprocessing, and a strong foundation in Deep Learning (DL) and Computer Vision (CV). I am skilled at designing and implementing advanced algorithms for automatic data processing systems. As a licensed drone pilot, I excel in ultra-high resolution ground data collection and platform payload testing. My continuous pursuit of innovative solutions drives me to expand my skill set and effectively contribute to diverse projects while seeking new learning and growth opportunities.

WORK EXPERIENCE

07/2023 - present

Research Fellow - Scuola di Ingegneria Aerospaziale – Roma

Led critical work packages for the CLEAR-UP project (funded by the Italian Space Agency), focusing on detecting methane local emissions using spaceborne hyperspectral sensors:

- Designed algorithms for automatic methane detection using PRISMA and EnMAP hyperspectral sensors. These algorithms implement techniques based on Clutter Matched Filter derivatives and at-sensor radiance simulations using Radiative Transfer Models.
- Quick deployment of always updated versions through containerization of the scripts.

07/2021 –06/2023

Research Fellow - Scuola di Ingegneria Aerospaziale – Roma

Research project: "Satellite images-based crop mapping and monitoring and support to AfriCRS products validation/demonstration":

- Supervised classification applying ML algorithms to multitemporal stacks of multispectral and SAR images in GEE and python.
- Development of procedures for the optimal field boundary delineation and segmentation using computer vision techniques.
- Development of innovative CNN based methodologies for classification and segmentation.
- Survey drone operator for multispectral mapping and ground data collection with several missions conducted in critical contexts.

EDUCATION AND TRAINING

2017 - 2020

MSc in Space and Astronautical Engineering (Sapienza University, Rome)

Comprehensive training in space mission technologies for Earth satellites and

interplanetary missions. Solid understanding of payload systems for Earth observation, including optical, thermal, and microwave technologies, with a special focus on raw SAR image processing, SAR interferometry, RADAR altimetry, and multispectral scanners. Proficient in atmospheric correction of multispectral images and extraction of land surface temperature from thermal infrared channels.

- Courses and certifications: (EU diploma supplement , PEGASUS certificate , AIDAA certificate)
- **Thesis :** Multitemporal Analysis of Multispectral Satellite Images for the Identification and Monitoring of Landfill Sites (MSc thesis PDF ppt presentation).

2012 - 2017 BSc in Mechanical Engineering (Polytechnic of Bari).

Solid training in the three main branches of mechanical engineering, with a strong emphasis on Material technology and a keen interest in structural engineering and thermo-hydraulic machinery.

Thesis: Anaerobic Digestion of Sludges and OFUW: Feasibility Analysis of a Plant in Puglia (BSc thesis PDF , PPT BSc thesis)

2022 - 2023 IBM AI Engineering Professional Certificate (V2) – IBM Skills Network

Courses passed (clickable link for credentials)

- Deep Learning with TensorFlow – IBM Skills Network – jan 2023
- Deep Neural Networks with PyTorch - IBM Skills Network - dec 2022
- Computer Vision and Image Processing Essentials - IBM Skills NetworkData - oct 2022
- Deep Learning Essentials with Keras - IBM Skills Network - aug 2022
- Machine Learning with Python - IBM Skills Network

2023 EASA Drone Pilot Licences
Conducted several Drone operations for land and water surfaces multispectral measurements, proficient in photogrammetry and mapping.

- Drone pilot license (A2 - EASA) – RDW - dec 2021 · ID credenziale NLD-RP-bld0kcku38pr
- Drone pilot license (A1/A3 - EASA) - ENAC may 2021 · ID credenziale ITA-RP-000013264ACE

PERSONAL SKILLS

| Mother tongue | Italian | | | | |

Other languages	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
Spanish	C1	C1	C1	C1	C1

Communication skills

▪ Strong communication skills developed through my roles as a Research Fellow and Consultant, where I effectively presented complex technical information to diverse stakeholders, including project teams and clients.
▪ Excellent written communication demonstrated by publishing multiple papers in prestigious conferences, effectively conveying research findings and methodologies.

Organisational / managerial skills

▪ Proficient in project planning and resource allocation, acquired through coordinating satellite image processing projects and ensuring timely delivery of high-quality outputs.

Job-related skills

▪ In-depth knowledge of machine learning algorithms and their application to satellite image processing, responsible for developing and implementing classification systems with high accuracy.
▪ Expertise in conducting drone missions for ultra-high resolution ground data collection, ensuring precise and efficient data acquisition for research and operational projects.
▪ EASA Drone Pilot License (Categories A1/A3 and A2), enabling efficient and safe drone operations for various applications.
▪ Proficient in photogrammetry, enhancing the accuracy of 3D models and maps derived from drone imagery.
▪ Experienced in multirotor and fixed wing aircraft assembly and configuration (Ardupilot based platforms), ensuring optimal performance and reliability.
▪ Skilled in PID controller calibration and configuration, optimizing flight control systems for stability and responsiveness.
▪ Capable of satellite telecommunication subsystems link budget analysis for effective communication and data transfer.
▪ Experienced in Computational Fluid Dynamics (CFD) and Computational Magnetohydrodynamics (CMHD) simulations, enabling detailed analysis of fluid and magnetic field interactions.
▪ Proficient in the assembly and repair of electronic devices, ensuring functionality and performance of various electronic systems.

Digital Competence

▪ Advanced proficiency in programming languages such as Python, used extensively for developing machine learning models and data processing scripts.
▪ Experience in containerization with Docker for effective software deployment, ensuring consistency, scalability, and efficient resource management.
▪ Experienced in using geographic information systems (GIS) and remote sensing software, including Google Earth Engine and various image processing tools, to analyse and interpret satellite data.
▪ Proficient in utilizing office productivity software (Microsoft Office Suite) for documentation and presentation purposes, ensuring clear and effective communication of project results.

ADDITIONAL INFORMATION

Publications
Presentations
Projects
Conferences
Seminars
Honours and awards
Memberships
References
Citations
Courses
Certifications

▪ Ferrari, A., Laneve, G., Pampanoni, V., Carvajal, A., Rossi, F. (2024, July). Monitoring Methane Emissions from Landfills Using PRISMA Imagery. In IGARSS 2024 IEEE International Geoscience and Remote Sensing Symposium (979-8-3503-6032-5/24/$31.00 ©2024 IEEE. (GitHub code Repository available here)
▪ Ferrari, A., Saquella, S., Laneve, G., Pampanoni, V. (2024, July). Automating Crop-Field Segmentation in High-Resolution Satellite Images: A U-Net Approach With Optimized Multitemporal Canny Edge Detection. In IGARSS 2024 IEEE International Geoscience and Remote Sensing Symposium 979-8-3503-6032-5/24/$31.00 ©2024 IEEE. (GitHub code Repository available here)
▪ Pampanoni, V., Laneve, G., Saquella, S., Ferrari A. (2024, July). Using Prosail Look-Up Tables To Train Random Forests Regressors For Fast Live Fuel Moisture Retrieval. In IGARSS 2024 IEEE International Geoscience and Remote Sensing Symposium (979-8-3503-6032-5/24/$31.00 ©2024 IEEE).
▪ Saquella, S., Ferrari, A., Pampanoni, V., & Laneve, G. (2023, July). Detection of Irrigated and Rainfed Crops with Machine Learning Multivariate Time-Series Object-Based Classification Using Sentinel-2 Imagery. In IGARSS 2023-2023 IEEE International Geoscience and Remote Sensing

Symposium (pp. 3438-3441). IEEE.
- Saquella, S., Laneve, G., Ferrari, A. (2022, July). A Cross-Correlation Phenology-Based Crop Fields Classification Using Sentinel-2 Time-Series. In IGARSS 2022-2022 IEEE International Geoscience and Remote Sensing Symposium (pp. 5660-5663). IEEE.