Alessandro Lotti
Aerospace Engineer - BS, MS, Ph.D. Candidate

I am a passionate **aerospace engineer** and **Ph.D. student** specializing in **space systems** and **computer vision**. With a strong work ethic I excelled in my BSc and MSc, while also privately teaching high school students and working as a degree program tutor. I proudly co-founded EUROAVIA Forlì-Bologna. In February 2021, I joined the **Microsatellites and Space Microsystems Lab** at the University of Bologna.

Info and Contacts

- Born in 1996, Italian citizen
- +39 **********
- alessandro@alessandrolotti.com
- **Personal website**
- LinkedIn

Skills

Research: self-learning, critical thinking, public speaking.

Scientific: space systems, neural networks, computer vision, problem solving.

Software: Simulink, Blender, COMSOL Multiphysics, TracePro.

Programming: MATLAB, Python, TensorFlow, GitHub, AWS, Astro.

Languages

Italian (native - C2)

English (fluent - C1)

French (intermediate - B2)

Certifications

2023 - **Reviewer**, **Acta Astronautica**, Eslevier.

2021 - **Deep Learning Specialization**, Coursera.

Awards

2021 - 1st place team, **T-TeC**, Telespazio - Led the proposal "**Multi-Purpose Modular Satellite Servicer**". (€ 10,000 prize)

2020 - **Top student**, *Aerospace Eng. 2nd year*, University of Bologna. (€1,500 prize)

2017 - 1st place team, *AlmaContest*, University of Bologna - Developed "**AlmaOrienteering**", enhanced university information Android app. (€ 2,750 prize)

References

Prof. **Paolo Tortora**
Professor of Space Systems, Alma Mater Studiorum - University of Bologna, Italy.

Prof. **Dario Modenini**
Associate Professor of Space Systems, Alma Mater Studiorum - University of Bologna, Italy.

Maria Antonietta Perino
Director Space Economy Exploration and International Network, Thales Alenia Space, Italy.

Paolo Panarese, Ph.D.
Principal Education Customer Success Engineer, The MathWorks, Srl, Italy.

Diego Nodar López
Chief Operating Officier, Alén Space, Spain.

Education

Doctorate - Aerospace Science   Nov. 2021 - Oct. 2024
Alma Mater Studiorum - University of Bologna, Italy.

My Ph.D. focuses on **autonomous satellite navigation for proximity and docking operations**. I specialize in **monocular pose estimation** using deep learning, emphasizing algorithm **deployability** and **domain gap**. In 2022 I ranked 4th and 5th in the ESA's satellite pose estimation challenge.

Supervisor: Prof. Paolo Tortora; co-supervisor: Prof. Dario Modenini.

Master of Science - Aerospace Engineering   2018 - 2020
Alma Mater Studiorum - University of Bologna, Italy.

I contributed to a microsatellite mission study, focusing on **attitude and power subsystems**, and developed a **thermal analysis model** for LEO satellites. I conducted my thesis in collaboration with Alén Space (Spain) on the preliminary design of the communication system for an ESA-contracted **robotic lunar cave exploration** study.

Exam average (out of 30): **29.87**; **graduation mark** (out of 110): **110 with honours.**

Bachelor of Science - Aerospace Engineering   2015 - 2018
Alma Mater Studiorum - University of Bologna, Italy.

My internship and final thesis focused on **GPS algorithms for orbit determination**.

Exam average (out of 30): **29.40**; **graduation mark** (out of 110): **110 with honours.**

Featured Experiences

Teaching Assistant and Student Supervisor   2020 - 2023
Alma Mater Studiorum - University of Bologna, Italy

I have supervised 6 BSc students on various **deep learning** topics **for space applications**. Since 2021, I have coordinated and supervised the annual Summer School in **Industrial Engineering for Advanced Automotive**. Additionally, in 2021, I worked as a teaching tutor for a course on Calculus and Linear Algebra.

MATLAB Student Ambassador   2021 - 2023
The MathWorks Srl, Italy.

I hosted educational events on the use of **MATLAB**, numerical computing, and deep learning, including seminars within bachelor's and master's degree courses.

Graduate Research Fellow   2021
Alma Mater Studiorum - University of Bologna, Italy.

I created a **photorealistic dataset** of a COSMO-SkyMed spacecraft using **Blender** and developed a pose estimation algorithm. This research project received funding from Thales Alenia Space Italia.

Featured Publications

A. Lotti, et al., 'Deep Learning for Real-Time Satellite Pose Estimation on Tensor Processing Units', Journal of Spacecraft and Rockets, 2023, doi: 10.2514/1.A35496.

A. Lotti, et al., 'Investigating Vision Transformers for Bridging Domain Gap in Satellite Pose Estimation', Studies in Computational Intelligence, 2023, doi: 10.1007/978-3-031-25755-1_20.

A. Lotti, 'Improving satellite pose estimation across domain gap with generative adversarial networks', 3rd Aerospace PhD Days, 2023, doi: 10.21741/9781644902677-55.