

Giacomo Curzi

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Ostra Vetere (AN), Italy - Via Monteduccio,6

PERSONAL STATEMENT

Passionate professional with hands-on experience within the aerospace field by contributing to ground segment development and collision avoidance strategies at University of Bologna.

Strong analytical, problem solving and interpersonal skills. Effective relationship builder and ability to think creatively using technical skills to adequately solve problems. Able to work effectively both as a part of a team and independently.

Result-orientated, attentive to the physics and details of the problem, with the right capabilities to make a genuine contribution as a young researcher.

KEY ACHIEVEMENTS

- Best paper of the year 2020 in *Aerospace (MDPI)*
- 1st place Telespazio Technology contest 2021 (#T-TeC)
- Winner Grant “Leonardo Da Vinci” 2020

CAREER HISTORY

CIRI Aeronautica – University of Bologna

Microsatellite System Research Assistant, March 2022 – Now

CIRI Aeronautica is the industrial research center for space, aeronautics and transport. It is the high-technology development center of the University of Bologna (UniBo) concerning aerospace.

- Spacecraft autonomy in Collision Avoidance contributing to UniBo’s internal project.
- Use of artificial intelligence in Spacecraft operations.
- Tutor activity for Students in Spacecraft Systems at University of Bologna.

CIRI Aeronautica – University of Bologna

Attitude Control System Research Assistant, January 2017 – May 2018

- Optical Attitude Estimator development contributing to the setup of a HITL test facility for CubeSat ADCS Systems.
- LEO CubeSat Attitude Control System preliminary study contributing to UniBo’s internal project.
- Tutor activity for Students in Spacecraft Systems at University of Bologna.

SITAEEL

Internship in Attitude Control System, January 2014 – March 2014

SITAEEL is the largest privately-owned Space Company in Italy leading the development of the Small Satellites sector.

- Developed a new test-interface software for TAU-D camera improving parameters setting operations
- Undertaken optimization of the developed software for ESEO (European Student Earth Orbiter) improving attitude sensors accuracy of the satellite

EDUCATION

University of Bologna:

*PhD in Mechanics and Advanced Engineering Science,
September 2018 – January 2022*

Project: Low cost autonomous management for constellations of small satellites

- Focus on collision avoidance systems
- Study of communication engineering and computer science
- Applications of Artificial Intelligence techniques through Logic Programming and Machine Learning (Neural Networks)

Complementary Activities: ESEO's spacecraft operations, ground segment design for mini-class satellites.

International Space University – Space Studies Program 2018

SSP18 Attendee at TU Delft, June 2018 – August 2018

Final Mark: A -

Group Project: Space-based Weather Forecast Improvement for the Energy Industry:

- Investigated remote sensing techniques for weather forecasts
- Investigated feasibility of satellite constellation for improved weather forecasts

Modules: Fundamentals of space law, Fundamentals of space business, Space science and remote sensing.

Cranfield University – School of Aerospace Transport and Manufacturing

Master Thesis Student, March 2016 – September 2016

Thesis Title: Trajectory Design of a Multiple Flyby Mission to Asteroids

- Developed and implemented a sequencing method in order to study feasibility of the mission
- Optimized the most scientifically relevant asteroid-flyby sequences contributing to ESA's M5 Call proposal by a cooperation between Cranfield University, OHB SE and Cambridge University.

University of Bologna

MSc in Aerospace Engineering, September 2014 – October 2016

Final Mark: 110/110 cum laude

Modules: Advanced Aerospace Propulsion, Spacecraft Orbital Dynamics, Spacecraft Attitude Dynamics and Control, Applied Aerodynamics, Atmospheric Flight Dynamics, Aerospace Structures.

Agenzia Spaziale Italiana

Concurrent Engineering Experience, 29-30 May 2014

- Mission analysis specialist for the design of a dummy space mission for Earth observation (mission analysis workstation)
- Undertaken STK analysis to assess requirements meeting

University of Bologna

BSc in Aerospace Engineering, September 2011 – July 2014

Final Mark: 106/110

Thesis Title: Calibration and validation of a software interface for the Earth sensor of ESEO

Modules: Automatic Controls, Fluid Dynamics, Flight Mechanics, Aerospace Propulsion Systems, Aeronautics Structures

SCIENTIFIC PUBLICATIONS

- G. Curzi and D. Modenini. Analytic solution for perturbed keplerian motion under small acceleration using averaging theory. *Advances in Space Research*, 2022. Manuscript submitted for publication
- D. Modenini, G. Curzi, and A. Locarini. Relations between collision probability, mahalanobis distance and confidence intervals for conjunction assessment. *Journal of Spacecraft and Rockets*, 2022. doi: <https://doi.org/10.2514/1.A35234>
- G. Curzi, D. Modenini, and P. Tortora. Two-line-element propagation improvement and uncertainty estimation using recurrent neural networks. *CEAS Space Journal*, 14:197–204, 2022. doi: 10.1007/s12567-021-00375-3

- G. Curzi, D. Modenini, and P. Tortora. A linear analytic solution for spacecraft motion under tangential thrust. *Stardust-R 2nd Global Virtual Workshop*, Virtual, Sept. 2021
- G. Curzi, D. Modenini, and P. Tortora. Large constellations of small satellites: A survey of near future challenges and missions. *Aerospace*, 7(133): 1–18, 2020. doi: 10.3390/aerospace7090133
- G. Curzi, A. Lucci, D. Modenini, P. Tortora, G. Mariotti, D. Cinarelli, V. Fabbri, and N. Melega. *Lessons learnt from operating ESEO educational spacecraft*. 3rd Symposium on Space Educational Activities, Leicester, UK, pages 1–18, Sept. 2019
- G. Curzi, A. Lucci, D. Modenini, P. Tortora, G. Mariotti, D. Cinarelli, V. Fabbri, and N. Melega. *Lessons learnt from operating ESEO educational spacecraft*. 3rd Symposium on Space Educational Activities, Leicester, UK, pages 1–18, Sept. 2019
- D. Modenini, G. Curzi, P. Tortora. Experimental Verification of a Simple Method for Accurate Center of Gravity Determination of Small Satellite Platforms. *International Journal of Aerospace Engineering*. 2018: 1-10, 2018. <https://doi.org/10.1155/2018/3582508>.
- D. Modenini, A. Bahu, G. Curzi, A. Togni. A Dynamic Testbed for Nanosatellites Attitude Verification. *Aerospace*. 7(3): 31, 2020. <https://doi.org/10.3390/aerospace7030031>.

LANGUAGES & IT SKILLS

Languages: English (Full Professional Proficiency), Italian (Native)

IT Skills:

- Programming: Experienced with MATLAB, C/C++, LabVIEW and Python. Basic knowledge of ProLog and SQL
- Design: Rhinoceros, Autocad Inventor, Solid Works
- Reporting: Office package, LaTeX

INTERESTS & ACTIVITIES

Interests: Space, Aeronautics, Flight, Sports, Music, Travelling.

Activities: Member of AvioClub Fano.

REFEREES

Paolo Tortora: Full Professor in Astronautics and Space Systems at University of Bologna. Director, Interdepartmental Center for Industrial Research in Aerospace.
e-mail: paolo.tortora@unibo.it

Joan Pau Sanchez Cuartielles: Lecturer in Space Engineering, Cranfield University (UK).
e-mail: jp.sanchez@cranfield.ac.uk