Lorenzo Feruglio

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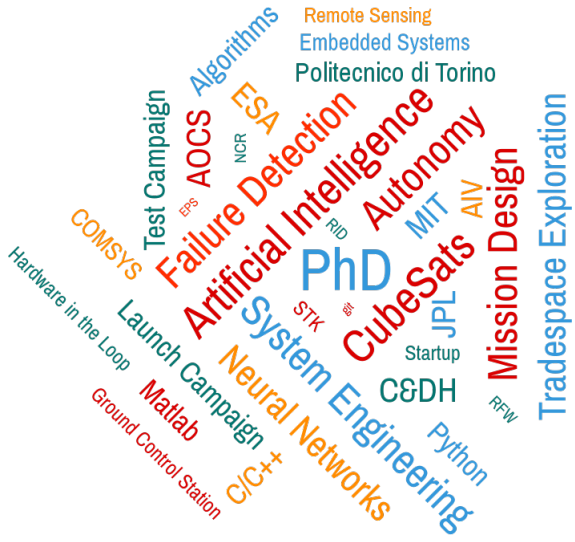

Education

2014–now **PhD Candidate**, *Aerospace Engineering, Politecnico di Torino*, Torino, Professor: Sabrina Corpino.

2016 Visiting Student Researcher (JVSRP) at **Jet Propulsion Laboratory** (JPL) for CubeSat Systems Engineering Research (Section 332H - Alessandra Babuscia)

2015 Visiting Student Researcher (JVSRP) at **Jet Propulsion Laboratory** (JPL) for Mission Autonomy Research (Section 332H - Kar-Ming Cheung)

2014 Exchange student at **Massachussetts Institute of Technology** 'CubeSat for Space Exploration: a new paradigm for Planetary Science Missions' (EAPS - Sara Seager)

2009–2012 **Aerospace Engineering**, *Politecnico di Torino*, Torino, *Master of Science*.
Graduated with Honors

2006–2009 **Aerospace Engineering**, *Politecnico di Torino*, Torino, *Bachelor's Degree*.

Summary

research Small Satellites, Autonomous Space Systems, Artificial Intelligence

experience Six years and counting of **hands-on experience** with CubeSats
Polito CubeSat Team Leader for C&DH, AOCS and GCS design

knowledge CubeSat design, Space Systems Engineering, Subsystems (AOCS, C&DH, COMSYS), TLM&TC software programming
Algorithm design, STK, Matlab/Simulink, Python, C/C++, ESA-DRAMA, ECSS

hands-on projects e-st@r CubeSat AIT (Hardware in the Loop simulations)
e-st@rII CubeSat from design phase to LEOP and Commissioning
3-STAR CubeSat for GNSS Remote Sensing and Earth Imaging

teaching assistant Space Systems and Mission Design, Master of Science course
Politecnico di Torino, 2014-2016

Experience

PhD Student - Space Systems Engineering

2014–now **Mission Autonomy**, *Politecnico di Torino*, Torino.
Methodologies and Technologies to Improve Small Satellites Space Mission Autonomy
Current field of research:
- Neural networks for image quality assessment and event detection
- Fuzzy logics and Neural Networks for failure detection of actuators
- Definition of case studies (Interplanetary CubeSats) in order to investigate on mission autonomy-enhancing technologies
- Genetic Algorithms to optimize Multi-Attribute Tradespace Exploration problems
- Hardware-In-The-Loop testing of training algorithms for neural networks for asteroid in situ detection

2015, 2016 **JVSRP**, *NASA Jet Propulsion Laboratory*, Pasadena, US.
- Tradespace Exploration for CubeSat mission design with Genetic Algorithms
- Inflatable Antenna Simulation and Testing
- System Engineering analysis for small satellite missions
- Small Satellite Mission Database design and development

Space Systems Engineer

2013–2014 **Assistant Researcher**, *Politecnico di Torino*, Torino.
Capture and De-Orbiting Technologies.
Field of Research:
- Development of a Simulator Technology to perform mission analyses and In-The-Loop simulations
- Research on GNC strategies for the latest phases of a rendez-vous and mating manoeuvre
- Attitude Determination and Control Algorithms testing on specific hardware (ARM architecture)
- Code development and upgrading for ADCS and OBC subsystems (e-st@rII CubeSat)
- e-st@r-II CubeSat Subsystem and System Functional Testing

2012–2013 **Operation Architecture Engineer**, *SES (contractor)*, Luxembourg.
Efficient Automation of Satellite Operations (EASO Project).
Detailed achievements:
- Development, verification and validation of automated procedures for Satellite Operations
- Payload and Bus operation procedures for the SES Orbital fleet:
  - Dynamic Satellite Simulators (Orbital)
  - AOCS, TCS, EPS, C&DH procedures development and subsystem analysis by means of Dynamic Satellite Simulations
  - Ground Control Station Software (SCORPIO)

2009–2012 **Polito CubeSat Team - Team member**, *Politecnico di Torino*, Italy.
Member of the University CubeSat Team, developing and launching 1U+ CubeSats.
Detailed achievements:
- Satellite (1U and 3U CubeSat) experience:
  - Systems Engineering methodologies
  - ADCS, C&DH Subsystem development and testing
  - CubeSat functional testing (test definition and execution)
  - ECSS standards for software development and testing
  - Real-time OS (Salvo, RTLinux)

Skills

Analysis	STK, Optimization, Dynamic Satellite Simulation (AOCS, Failure Detection Systems), Space Debris Mitigation
Systems Eng	ECSS, Multi-Attribute Tradespace Exploration, Satellite System Budgets (Link, Power, Mass, ...), Mission Design and Functional Analysis
Programming	Matlab/Simulink, Python, C/C++, Data Driven and Test Driven Development, SysML, UML, git
Embedded	MPS430, ARM9, Raspberry-Pi, Satellite Hardware-In-The-Loop Testing
Miscellaneous	MS Office, Visio, LaTex
OS	UNIX (Ubuntu), RTLinux, Windows
Languages	Italian (Mother language), English, basic French and German