Christian Hofmann

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Expertise and Research Interests
Astrodynamics, Computational Guidance and Control, Interplanetary CubeSats, Space Trajectory Design and Optimization, Nonlinear Optimal Control

Education

Ph.D. in Aerospace Engineering Since 2018
Politecnico di Milano, Italy
Title: Autonomous Guidance of Power-Limited Low-Thrust Spacecraft in Deep Space
Advisor: Dr. Francesco Topputo

Master of Science in Aerospace Engineering (with honors) 2013–2016
Technical University Braunschweig, Germany

Bachelor of Science in Aerospace Computer Science 2009–2012
University of Würzburg, Germany

Research & Professional Experience

Research Assistant Since 2021
Politecnico di Milano, Italy
Mission analysis for ESA's M-ARGO mission

Research Assistant 2018
Zentrum für Telematik e.V., Germany
Research area: GNC for CubeSat formation flying missions, distributed control for space

Research Assistant 2017–2018
German Aerospace Center e.V. (DLR), Germany
Research area: Space trajectory optimization, mission analysis

International Graduate Program in Engineering 2016–2017
AAM Germany GmbH, Germany

Master Thesis 2015–2016
Airbus Operations GmbH, Germany

Teaching & Supervising

Supervisor for M.Sc. research student Since 2021
Politecnico di Milano, Italy
Topic: Space trajectory optimization with mission constraints

Teaching assistant for the course 'Introduction to Space Mission Analysis' Since 2019
Politecnico di Milano, Italy

Supervisor for two M.Sc. research students 2020
Politecnico di Milano, Italy
Topics: Space trajectory optimization with convex programming and machine learning

Supervisor for M.Sc. research student 2018
Zentrum für Telematik e.V., Germany
Topic: Predictive networked attitude control of fractionated spacecraft

Teaching assistant for the course 'Robotics' 2012–2013
University of Würzburg, Germany

Fellowships, Awards & Achievements

Roberto Rocca Fellowship 2021–2022
Massachusetts Institute of Technology, USA / Politecnico di Milano, Italy

Faculty Ph.D. scholarship Since 2018
Politecnico di Milano, Italy

Selected for MAECI scholarship for international students 2018
Ministry of Foreign Affairs and International Cooperation, Italy

Master thesis in collaboration with Airbus Operations GmbH rated excellent 2016
Airbus Operations GmbH / Technical University Braunschweig, Germany

Among the best 2% of all university graduates in engineering in Germany 2016
Federal Statistical Office, Germany

Faculty excellence scholarship 2014
Technical University Braunschweig, Germany

Selected for Fulbright travel grant 2014
Fulbright Commission, Germany

International Reputation

Reviewer for the journal 'Advances in Space Research'	Since 2021
Reviewer for the AAS journal 'Journal of Guidance, Control, and Dynamics'	Since 2021
Presenter at the 31st AAS/AIAA Space Flight Mechanics Meeting (virtual)	2021
71st International Astronautical Congress (virtual)	2020
Co-author of the successful ERC grant proposal 'EXTREMA' with Dr. F. Topputo	2019
Organization of the 8th Interplanetary CubeSat Workshop in Milan, Italy	2019

Languages

German: mother tongue
English: C1
Spanish: B1
Italian: B1

Computer skills

Matlab/Simulink: 10 yr of experience
C/C++: 5 yr
Java: 4 yr
NASA SPICE: 3 yr

Python: 4 yr

Embedded systems: 4 yr

Interests

Space: astronautics, astrodynamics, astronomy

Exploring: traveling, nature

Sports: cycling, soccer, calisthenics, running

Publications

C. Hofmann and F. Topputo. Rapid low-thrust trajectory optimization in deep space based on convex programming. *Journal of Guidance, Control, and Dynamics*, 2021.

C. Hofmann and F. Topputo. Toward On-Board Guidance of Low-Thrust Spacecraft in Deep Space Using Sequential Convex Programming. In *AAS/AIAA Space Flight Mechanics Meeting*, February 2021. AAS Paper 21-350.