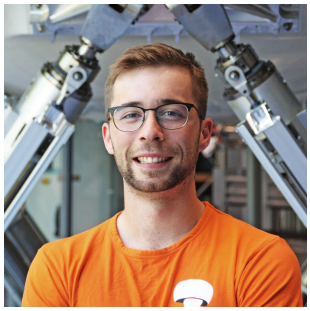
Sebastien **Origer**

PhD Aerospace Engineering | Guidance & Control Systems



Contact info

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Via Baldassarre
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47121, Forlì
Italy (Work)

Nationalities:
Luxembourgish
Belgian

Year of birth: 1998

Languages

English: fluent
German: fluent
French: mother tongue
Luxembourgish: mother tongue
Italian: beginner

Software

C/C++, Python, Matlab, Simulink, Github, OpenCV, Manim

About me

I am grateful and fortunate to have found areas in science which keep my inner ”childish” curiosity alive. My past has been marked by a lot of sports, deep human connections and challenging studies. I wish to pursue a career where I can constantly learn, ideally in research. My peers describe me as someone who has a lot of internal drive, a positive attitude and is able to give and receive honest feedback.

Experience

2023 - 2025 **Trainee in AI & Inverse Problems** — European Space Agency
Application: Guidance & control of spacecraft
Methods: Reinforcement learning, behavioral cloning and differential algebra

2021 **Intern in AI & Trajectory Optimization** — European Space Agency
Application: Guidance & control of spacecraft
Methods: Backward Generation of Optimal Samples

2018 - 2019 **Structures engineer (part-time)** — Delft Aerospace Rocket Engineering
Developed a scalable separation mechanism for staged rockets

Education

2025 - 2028 **PhD Aerospace Engineering** — University of Bologna & European Space Agency
Topic: Autonomous Attitude Guidance and Control for Agile Maneuvering Spacecraft

2020 - 2023 **MSc Aerospace Engineering** — Delft University of Technology
Specialisation: Control & Simulation
Thesis: Guidance & Control Networks for Fast Quadcopter Flight

2017 - 2020 **BSc Aerospace Engineering** — Delft University of Technology
Thesis: Designing a flight simulator for upset prevention & recovery training
Minor program: Human Machine Interfaces — The University of Sydney

Publications

2025 **Comparing Behavioural Cloning and Reinforcement Learning for Spacecraft Guidance and Control Networks**
H. Holt, S. Origer, D. Izzo.
Submitted to *Journal of Guidance, Control, and Dynamics*

2025 **High-order Expansion of Neural Ordinary Differential Equations flows**
D. Izzo, S. Origer, G. Acciarini, F. Biscani. Under review at *Science Advances*

2024 **Closing the gap: Optimizing Guidance and Control Networks through Neural ODEs**
S. Origer, D. Izzo. International Symposium of Space Flight Dynamics

2024 **Certifying Guidance & Control Networks: Uncertainty Propagation to an Event Manifold**
S. Origer, D. Izzo, G. Acciarini, F. Biscani, R. Mastroianni, M. Bannach, H. Holt. IAC Conference

2024 **Optimality Principles in Spacecraft Neural Guidance and Control**
D. Izzo, E. Blazquez, R. Ferede, S. Origer, C. De Wagter, G.C.H.E. de Croon. Science Robotics

2024 **Guidance and Control Networks with Periodic Activation Functions**
S. Origer, D. Izzo. Accepted in *Astrodynamics* and presented at *SPAICE IAA Conference*

2024 **The Space Optimization Competition: Third Edition**
M. Bannach, E. Blazquez, D. Izzo, G. Acciarini, A. Hadjiivanov, G. Heissel, R. Mastroianni, S. Origer, J. Grover, D. Dold, Z. Rudge.
Genetic and Evolutionary Computation Conference

2023 **Guidance & Control Networks for Time-Optimal Quadcopter Flight**
S. Origer, C. De Wagter, R. Ferede, G.C.H.E. de Croon, D. Izzo.

2023 **Neural Representation of a Time-Optimal, Constant-Acceleration Rendezvous**
D. Izzo, S. Origer. Acta Astronautica

Scientific Outreach

2022 - 2025 **Created scientific animations for research papers** Self-initiated, YouTube
Paper: High-order expansion of Neural Ordinary Differential Equations flows
Video: *https://youtu.be/0YmY4Zn4yIY?si=mxDXO6PiOniRXaOT*

Paper: Neural Representation of a Time-Optimal, Constant-Acceleration Rendezvous
Video: *https://youtu.be/XdpqDP_hY4k?si=oae9UCtTtvfyCLMN*

Paper: Guidance & Control Networks for Time-Optimal Quadcopter Flight
Video: *https://youtu.be/FrwpODT0HKQ?si=0KdI3Edz-t-ALhE-*

Interests

Social
Fostering social relationships, being part of a team, creative sessions and deep talks

Technical
Programming, physics and making animations

Personal
High intensity sport, travelling and learning Italian

Volunteering

2020 - 2021 **Board member at STABILO** TU Delft Aerospace faculty
Responsible for lunch lectures, Control Career Fair and social activities

2015 - 2017 **Member of Sport committee** Lycée Classique Aline Mayrisch
Responsible for the organization and promotion of sports events