Marlin Polo Strub, PhD
Born on the 28th of August 1991, Swiss citizen

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Professional Experience

01/2022–present **Robotics Technologist & Postdoc** · NASA/JPL United States of America

- Leading the path-planning team and designing, implementing, and testing locomotion concepts and algorithms for multiple versions of the Exobiology Extant Life Surveyor (EELS), a snake-like robot with up to 36 degrees of freedom.
- Designing, implementing, and testing the path-planning algorithm for the Sample Recovery Helicopters (SRH) ground mobility control framework.
- Advising the Cooperative Autonomous Distributed Robotic Exploration (CADRE) team on path-planning algorithms and implementation.

Academic Background

09/2018–01/2022 **PhD Engineering Science** · University of Oxford United Kingdom

Thesis: *Leveraging multiple sources of information to search continuous spaces*
Supervisor: Prof. J. D. Gammell (Estimation, Search, and Planning Group)

09/2015–12/2017 **MSc Robotics, Systems, and Control** · ETH Zurich Switzerland

GPA: 5.44/6, Tutor: Prof. R. Siegwart (Autonomous Systems Lab)

Thesis: *Exploring continuous representations of the world for place recognition*
Supervisor: Prof. M. Chli (Vision for Robotics Lab), graded: 5.75/6

09/2012–09/2015 **BSc Mechanical Engineering** · ETH Zurich Switzerland

GPA: 5.27/6, Focus on Mechatronics

Thesis: *Model-based control of a bounding gait for a quadruped robot*
Supervisor: Prof. R. Siegwart (Autonomous Systems Lab), graded: 5.75/6

08/2004–09/2011 **Matura** · KSOe / Cloquet Senior High Switzerland / United States of America

GPA: 5.23/6, Focus on Natural Sciences and Mathematics

Part-time Work, Internships, and Affiliations

04/2019–09/2019 **Affiliate Researcher** · NASA/JPL United States of America

Designed, implemented, and tested a path-planning algorithm for Axel, a tethered rover for the exploration steep and rugged terrain.

10/2016–04/2017 **Aerial Robotics Intern for Computer Vision** · GoPro Switzerland

Owned algorithmic design, software architecture, and C++ implementation of a high-fidelity camera- and camera-IMU-calibration framework.n

02/2015–06/2016 **Teaching Assistant for Computer Science** · ETH Zurich Switzerland

Taught basics on GNU/Linux and the C++ programming language.

09/2015–12/2015 **Teaching Assistant for Electrical Engineering** · ETH Zurich Switzerland

Taught basics on electrical circuits and the underlying physics.

Community Service

07/2019–present **Developer and Co-Maintainer** · Open Motion Planning Library (OMPL) Remote
Contributing algorithms, features, and bug fixes to OMPL (website, github).

03/2019–present **Reviewer** · Institute of Electrical and Electronics Engineers (IEEE) Remote
Reviewing papers for IROS, ICRA, T-ASE, and RA-L.

02/2014–10/2018 **Cofounder & Skipper** · Swiss Mocean Switzerland / The Atlantic Ocean
- Skipper of the first Swiss four-man team to ever row across any ocean.
- Team achieved third-fastest time of any unsupported row across the Atlantic ever.
- Raised over $ 165,000, which allowed us to donate almost $ 40,000 to children in need.

07/2014–11/2017 **Volunteer Firefighter** · City of Zurich Switzerland
Completed training for and served as a volunteer firefighter for the city of Zurich.

02/2012–08/2012 **Fire Team Leader** · Swiss Military Switzerland
Completed training for and served as a fire team leader in the special forces command.

Awards and Certificates

2018–2021 **EPSRC PhD Scholarship** (£ 15'000, annualy)
PhD scholarship at the University of Oxford.

2020 **NASA Group Achievement Award**
Developing and testing extreme terrain robotic mobility.

2020 **Lady Margaret Hall Graduate Scholarship** (£ 3'000)
Scholarship based on academic merit.

2020 **Lady Margaret Hall Academic Development Award** (£ 150)
Scholarship toward attendance of conference.

2019 **Warr-Goodman Scholarship** (£ 4'000)
Scholarship based on academic merit.

2019 **Lady Margaret Hall Academic Development Award** (£ 300)
Scholarship toward NASA/JPL field tests in Mojave Desert, California.

2010 **Cambridge Certificate of Proficiency in English** (C2 Proficiency)
Highest level qualification provided by Cambridge Assessment English.

Publications

Journal articles

RA-L 2022 W. Thomason, M. P. Strub, J. D. Gammell, *Task and Motion Informed Trees (TMIT*): Almost-surely asymptotically optimal integrated task and motion planning*, IEEE Robotics and Automation Letters (RA-L), 7(4): pages 11370–11377. (doi, arXiv)

IJRR 2022 M. P. Strub, J. D. Gammell, *AIT* and EIT*: Asymmetric bidirectional sampling-based path planning*, The International Journal of Robotics Research (IJRR), 41(4): pages 390–417. (doi, arXiv)

ARCRAS 2021 J. D. Gammell, M. P. Strub, *Asymptotically optimal sampling-based motion planning methods*, Annual Review of Control, Robotics, and Autonomous Systems (ARCRAS), 4(1): pages 295–318. Invited. (doi, arXiv)

Conference papers

IROS 2023 R. Thakker, M. Paton, M. P. Strub, M. Swan, G. Daddi, R. Royce, et al, *EELS: Towards autonomous mobility in extreme terrain with a versatile snake robot with resilience to exteroception failures* In Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). to appear.

ISRR 2022 V. N. Hartmann, M. P. Strub, M. Toussaint, J. D. Gammell, *Effort Informed Roadmaps (EIRM*): Efficient asymptotically optimal multiquery planning by actively reusing validation effort*, In Proceedings of the International Symposium on Robotics Research (ISRR). (arXiv)

IROS 2020 M. Paton, M. P. Strub, T. Brown, R. J. Greene, J. Lizewski, V. Patel, J. D. Gammell, I. A. D. Nesnas, *Navigation on the line: Traversability analysis and path planning for extreme-terrain rappelling rovers*, In Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). pages 7034–7041. (doi, open access)

ICRA 2020 M. P. Strub, J. D. Gammell, *Adaptively Informed Trees (AIT*): Fast asymptotically optimal path planning through adaptive heuristics*, In: Proceedings of the IEEE International Conference on Robotics and Automation (ICRA). pages 3191–3198. (doi, arXiv)

ICRA 2020 M. P. Strub, J. D. Gammell, *Advanced BIT* (ABIT*): Sampling-based planning with advanced graph-search techniques*, In: Proceedings of the IEEE International Conference on Robotics and Automation (ICRA). pages 130–136. (doi, arXiv)

Workshop papers

IROS 2022 J. D. Gammell, M. P. Strub, V. N. Hartmann, *Planner Developer Tools (PDT): Reproducible experiments and statistical analysis for developing and testing motion planners*, In Proceedings of the Workshop on Evaluating Motion Planning Performance (EMPP), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). (open access)

Theses

PhD 2022 M. P. Strub, *Leveraging multiple sources of information to search continuous spaces*, PhD (DPhil) Thesis. University of Oxford (Oxford University Research Archive)

MSc 2017 M. P. Strub, *Exploring continuous representation of the world for place recognition*, MSc Thesis. ETH Zurich.

BSc 2015 M. P. Strub, *Model-based control of a bounding gait for a quadruped robot*, BSc Thesis. ETH Zurich.

Technical reports

arXiv 2021 M. P. Strub, J. D. Gammell, *Admissible heuristics for obstacle clearance optimization objectives* (arXiv)