

Dr. Raphael Zufferey

Research fellow in multi-environment
unconventional aerial systems

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Education

Dec 2021 - **Postdoc Fellowship**, EPFL, Switzerland.



Marie Skłodowska-Curie Fellow

Member of the [LIS](#) and [BIOROB](#) groups. Research: Aerial-Aquatic Flapping-wing robotics.

2020-2021 **Postdoc**, University of Seville, Spain.



Member of the [Robotics Vision and Control](#) research group led by Prof. Ollero.

Research: Design and development of novel flapping-wing aerial robots to test and validate our biological understanding of the natural counterparts.

2016-2019 **PhD**, Imperial College London, UK.



Member of the [Aerial Robotics Lab](#) research group. Research: *Aquatic Escape of Micro Aerial Vehicles*.

Thesis content: Practical and theoretical investigations into miniature aerial-aquatic robots capable of movement in both air and water. The work required extensive experimental work and resulted in two unique prototypes with distinct locomotion strategies. Supervision by Dr. M. Kovac. Department of aeronautics. (*Defended on 27 sept 2019*). Followed by 8 months at the CASCADE aerial-aquatic research program.

2015 **Master thesis**, Harvard University, US.



Student at the [Microrobotics Laboratory](#) research group. Research: Development of a micro legged robot of 2.5 grams, the Harvard Ambulatory Micro Robot (HAMR), involving key advances in piezoelectric actuators, micro PCB fabrication, wireless implementation. Significant challenges in small scale system integration were overcome. Supervision by Prof. R.J. Wood and Prof. D. Floreano.

2010-2015 **MSc, BA**, EPFL, Switzerland.



[Micro-engineering](#) bachelor and master, emphasis on electrical, mechanical and material science in addition to micro-systems, from semi-conductor physics to embedded programming. Specialization in robotics and autonomous system.

Minor in Space Design and Technology

Final grade 5.4/6

Experience

2022-2023 **Teaching**, EPFL.

Part teaching of the Aerial Robots class (60-120 students).

2013-2019 **Teaching Assistant**.

Imperial College London: 3rd year robotics application class. Experiment setup and guidance.

EPFL: Physics I, Physics II and Electromechanic Conversion teaching assistant.

2016-2019 **Webmaster**, Imperial College London.

Webmaster of the Aerial Robotics Lab website, including internal wiki development.

2014 **Intern**, Logitech, Switzerland.

Collaboration with Future Labs in the implementation of gesture control in a professional 2D camera.

2014 **Competition**, EPFL.

[Autonomous robotics competition](#), development of a multi-terrain robot which localises itself, detects, picks up and brings home plastic bottles in unknown environment with obstacle avoidance and path planning. (supervision by Prof. A. Ijspeert)

- 2013-2014 **Semester Projects, EPFL.**
 Project 1: Finite Element analysis of hyperelastic membranes in DEAs.
 Project 2: Digital Sun Sensor : Interfacing and programming of a bare-die HDR camera array.
- 2009-2010 **Language Development, Bath Academy, UK & Bellevue College Seattle, US.**
 Intensive english studies and public speaking classes.

Leadership

- 2022-2023 **Supervisor, EPFL.**
 Direct supervisor of 7 semester students, 3 master thesis, 1 lab engineer, 1 visiting PhD, 3 summer students.
- 2020-2021 **Supervisor, University of Seville.**
 Supervisor of a team of 4 researcher developing the first branch-perching flapping-wing robot.
- 2016-2019 **Supervisor, Imperial College London.**
 Close supervision of 4 master students and 2 undergraduates in aerial aquatic robotics. Work ranging from chemical propulsion vehicles, water entry studies and launch systems development to sailing flying robots.
- 2008-2016 **Scout Group Leader, Nyon.**
 7 summer camps organized for 10-80 young people. Jeunesse et Sport (J+S) leader licence. Water rescue licenses: Pool, Lake and River Rescue.
- 2012-2015 **Department Delegate, EPFL.**
 Micro-engineering class delegate during 3 years.
- 2012-2013, **University societies committee.**
 2018 1st year student Coaching society, EPFL
 Micro-technology society, EPFL
 Windsurfing society, Imperial College London

Skills

- Professional Micro technologies: analog and digital electronics, standalone and embedded sensors, mechanics and micro-structure, robotic design, embedded software, semi-conductor physics, evolutionary algorithms, FEM, unmanned aircraft design, 3D motion capture system
- Manufacturing Machining, composites fabrication (prepreg, wet layup), 3D printing (plastics/metals), Laser micro machining, PCB design and fabrication
- Computing C, C++, Matlab, Python, GitHub, Solidworks, Draftsight, Creo, Fusion 360, L^AT_EX
- Design Adobe Illustrator/ Photoshop/ Premiere/ Lightroom/ After Effect, Blender
- Sports Rock climbing 3x/week, windsurf, ski, snowboard, badminton & tennis
- Music Classical Piano and acoustic guitar
- Language **French**, native
German, native
English, proficient (*IELTS score 8/9*)
Spanish, fluent (*C2*)

Grants & Awards

- 2021 **Marie Skłodowska-Curie Actions (MSCA)** Individual Fellowship
- 2020 **Best PhD in Robotics UK**, The Queen Mary UK Best PhD in Robotics Award
- 2019 **Best Paper Award**, AMAM 2019 conference, Lausanne Switzerland (Only award out of 82)
- 2018 **Best Conference Paper Nominee**, ICRA 2018 conference, Brisbane
- 2017 **Best Robot Video**, Aquatic Micro Air Vehicles for Water Health Monitoring, AAI-17, San Francisco
- 2009 Swiss Physics Olympiads nominee

Outreach

- Nov 2023 Presenter at the Swiss Robotics Days for the general public
- Jan 2022 Organizer, The Natural Robotics Contest
- June 2021 Guest Lecture at TUM, eAviation Lab
- Sept 2020 Invited talk "Best PhD Award" at TAROS, UK
- Jan 2020 Invited "Extreme Environment Robotics" talk at IEEE UK RAS Chapter conference
- Dec 2019 Invited talk at Sevilla Robotics Vision and Control [group](#)
- Nov 2019 Session Chair, IROS, Macau
- Nov 2019 Invited Talk at the Marine Soft-robotics workshop at IROS, Macau
- Sept 2019 Invited Talk at the SOARX Bio-inspired Conference in London
- March 2019 Invited [Talk](#) on mobile robots, Spain Research Institute (IMDEA)
- April 2018 Royal Geographical Society, demonstration for children of mobile robotics
- 2017 Science Museum London, Gallery Exhibit on Aquatic Micro Air Vehicle prototype
- July 2017 Science Museum '[Lates](#)' Exhibitor
- 2017, 2018 [Imperial Festival](#) Presenter
- Sept 2016 Live Robotics demo of the AquaMAV as part the Breaking The Surface conference

Academic activities

- Editorial Associate Editor for **Robotics and Automation Letters (RA-L) 2023-2024**
Associate Editor for **International Conference on Robotics and Intelligent Systems 2023**
Associate Editor for **BioRob** IEEE conference 2022
Editor for the [Drones in the Wild](#) MDPI special issue 2022-2023
- Journal Science Robotics
- reviewer Nature Communications Engineering
IEEE Transaction on Robotics (TRO)
IEEE Robotics and Automation Letters (RA-L)
IEEE Mechanism and Machine Theory (MECH-MT)
IOP Bioinspiration & Biomimetics
Journal of Field Robotics
- Conference IEEE RoboSoft Conference
- reviewer IEEE International Conference on Robotics and Automation (ICRA)
IEEE International Conference on Robotics and Intelligent Systems (IROS)
IEEE Advanced Intelligent Mechatronics (AIM)