Florian **Berlinger**

Postdoctoral fellow – Co-founder – Roboticist

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Overview

- Computer scientist (with engineering background), passionate about scalable and robust multi-agent systems, for instance as self-driving cars in everyday traffic or robot fleets in automated warehouses.
- Full-stack roboticist mastering mechanical, electronic, algorithm, and control design with project experience in collective intelligence, inspection robotics, medical devices, and smart material systems.
- Enthusiastic entrepreneur, keen on offering simple real estate investing opportunities to everyone by leveraging and streamlining equity crowdfunding.

Skills & Interests

- **Areas of Expertise**: artificial intelligence, robotics, systems engineering, software design, product development, project management
- **Programming**: Python, MATLAB, C/C++, HTML/CSS, Git, LaTeX
- **Fabrication**: Computer-Aided Design, PCB design, 3D printing, laser cutting, milling, molding and casting, soldering
- **Languages**: English (fluent), German (mother tongue), French (conversational), Spanish (basic)

Education

Harvard University, PhD and MS in Computer Science — Cambridge, USA — 2021
- Advisor: Prof. Radhika Nagpal
- Thesis: Blueswarm — 3D Self-organization in a Fish-inspired Robot Swarm

ETH Zurich, MS in Mechanical Engineering — Zurich, CHE — 2016
- Advisor: Prof. Bradley Nelson
- Thesis: A Low-Cost, Highly Maneuverable, Miniature Underwater Robot Intended for Collective Behaviors

ETH Zurich, BS in Mechanical Engineering — Zurich, CHE — 2013
- Advisor: Prof. Roland Siegwart
- Thesis: Obstacle Climbing Control for an Inspection Robot with Magnetic Wheels

Work & Research

RESE Inc. – Real Estate Made Easy for All, Co-founder — Boston, USA
RESE lets you invest in real estate just like in stocks — 2021 – present
- Designed and launched a waitlist campaign (https://ww2.rese.us)
- Participated in the venture program of the Harvard Innovation Labs

Harvard University, Self-Organizing Systems Research Group — Cambridge, USA
Prof. Radhika Nagpal — 2017 – present
- Designed and fabricated a miniature underwater robot with 3D fin-propelled locomotion and 3D visual perception suitable for collective behaviors
- Developed bio-inspired algorithms for 3D collective behaviors in simulation and with a physical robot swarm
- Contributed to the acquisitions of a $567k ONR and a $225k Amazon grant

Harvard University, Microrobotics Laboratory — Cambride, USA
Prof. Robert Wood — 2017 – 2020
- Applied custom-made dielectric elastomer actuators (DEAs) in soft robotics
- Demonstrated an autonomous DEA-driven underwater robot and a bending beam DEA for multi-modal locomotion (crawling, hopping, jumping, rolling)

Harvard University, Lauder Laboratory — Cambridge, USA
Prof. George Lauder — 2018 – 2020
- Designed a biomimetic fish-like underwater robot suitable as an experimental platform for addressing open questions in aquatic locomotion

- Replicated three key characteristics of fish swimming: linear speed-frequency relationship, U-shaped cost of transport, reverse Kármán wakes
- Used the robot to validate a thrust enhancement hypothesis for energy savings in fish schooling
- Developed a novel schooling-inspired propulsor for energy efficient underwater vehicles

Wyss Institute for Biologically Inspired Engineering, Self-Organizing Systems Research Group — Cambridge, USA
Prof. Radhika Nagpal — 2016 – 2017
- Worked as a research fellow and led the conception of novel multi-agent robotics platform for the investigation of collective behaviors in 3D space

ETH Zurich, Multi-Scale Robotics Lab — Zurich, CHE
Prof. Bradley Nelson — 2014
- Designed a miniscule force sensing catheter capable of measuring contact forces at its distal end during cardiac ablation
- Demonstrated tissue sampling (texture and flexibility) for diagnostic purposes

Bühler Group, Innovation Lab at R&D Food Processing — Bangalore, IND
Calvin Grieder, chairman and former CEO — 2013 – 2014
- Managed a $30k budget to conduct industrial research including the conception, design, and validation of food processing machines that are sold for profit
- Designed the framework and motor suspension for a novel and now commercially available single screw extruder
- Visited customers in Northern India to test prototypes for controlled and cost-effective oil spraying of pulses on site

ETH Zurich, Autonomous Systems Lab & Alstom Inspection Robotics — Zurich, CHE
Prof. Roland Siegwart & Dr. Ekkehard Zwicker — 2012 – 2013
- Designed Ship Inspection Robot, a robust, cheap, and easy to operate inspection tool for the maritime transport sector intended to reduce costly inspection time in dry docks
- Contributed to an innovative overlapping wheel configuration (patented!) for overcoming a broad variety of obstacles encountered in cargo ships including I-shaped stiffeners
- Led the research team of 10 interdisciplinary undergraduate students, oversaw the $15k budget, negotiated with manufacturers and suppliers, reported to investors and experts

Leadership & Service

- **Harvard University**, mentored and supervised several graduate and undergraduate students, taught and lectured in 2 AI/robotics classes (CS189 and CS289) — 2018 – 2021
- **reatch.ch**, member of the reatch-team for artificial intelligence, wrote an article on AI — 2017 – 2018
- **ETH Alumni New England Chapter**, board member, organized talks with ETH professors — 2016 – present
- **ETH Zurich**, coached 3 undergraduate engineering teams during their “Innovation Process” course, supported them in conceptualizing and realizing a mechatronic system with several sensors and actuators — 2013
- **Wiler Forum for Sustainability Issues (WIFONA)**, board member and vice president, organized forums with Swiss Federal Councilors for several hundred participants — 2010 – 2016

Selected Publications & Patents (2 of 11)

- F. Berlinger, M. Gauci, R. Nagpal, Implicit coordination for 3D underwater collective behaviors in a fish-inspired robot swarm. *Science Robotics.* 6, eabd8668 (2021). — Cover Article
- F.C.J. Berlinger, C.M. Clausen, Y. Detrekoey, J. Eichenberger, M.A. Eppenberger, M.S. Fisler, A. Mueller, S.M. Schmid, W. Fischer, Carriage cart with obstacle overcoming. *General Electric Technology GmbH*, U.S. Patent Application 15/041,652 (2016).

Selected Fellowships & Awards (4 of 12)

- **Fellowship**, Swiss Study Foundation — 2011 – 2020
- **Best Paper Finalist**, International Conference on Robotics and Automation — 2018 & 2021
- **Certificate of Distinction in Teaching**, Harvard University Bok Center — 2018
- **Best Innovator Award**, Bühler Group — 2013