



Overview

- PhD candidate in computer science (with engineering background) seeking to enable 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.
- Innovative thinker well-versed in initializing and managing transdisciplinary research projects and collaborations.
- Efficient leader and communicator skilled at defining expectations, distributing workload, and coordinating diverse team members.

Skills & Interests

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

Education

Cambridge, USA 2017 – present	Harvard University PhD and MS in Computer Science, Advisor: Prof. Radhika Nagpal Thesis: 3D Vision-Based Collective Behaviors in a Fish-Inspired Robot Swarm
Zurich, CHE 2014 – 2016	ETH Zurich MS in Mechanical Engineering, Advisor: Prof. Bradley Nelson Thesis: A Low-Cost, Highly Maneuverable, Miniature Underwater Robot Intended for Collective Behaviors
Zurich, CHE 2010 – 2013	ETH Zurich BS in Mechanical Engineering, Advisor: Prof. Roland Siegwart Thesis: Obstacle Climbing Control for an Inspection Robot with Magnetic Wheels

Work & Research

Cambridge, USA 2017 – present	Harvard University, Self-Organizing Systems Research Group Prof. Radhika Nagpal <ul style="list-style-type: none">○ 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 acquisition of a \$225k Amazon grant
Cambridge, USA 2017 – 2020	Harvard University, Microrobotics Laboratory Prof. Robert Wood <ul style="list-style-type: none">○ 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)
Cambridge, USA 2018 – 2020	Harvard University, Lauder Laboratory Prof. George Lauder <ul style="list-style-type: none">○ 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

Cambridge, USA 2016 – 2017	Wyss Institute for Biologically Inspired Engineering, Self-Organizing Systems Research Group Prof. Radhika Nagpal <ul style="list-style-type: none"> o Worked as a research fellow and led the conception of novel multi-agent robotics platform for the investigation of collective behaviors in 3D space
Zurich, CHE 2014	ETH Zurich, Multi-Scale Robotics Lab Prof. Bradley Nelson <ul style="list-style-type: none"> o Designed a miniscule force sensing catheter capable of measuring contact forces at its distal end during cardiac ablation o Demonstrated tissue sampling (texture and flexibility) for diagnostic purposes
Bangalore, IND 2013 – 2014	Bühler Group, Innovation Lab at R&D Food Processing Calvin Grieder, chairman and former CEO <ul style="list-style-type: none"> o Managed a \$30k budget to conduct industrial research including the conception, design, and validation of food processing machines that are sold for profit o Designed the framework and motor suspension for a novel and now commercially available single screw extruder o Visited customers in Northern India to test prototypes for controlled and cost-effective oil spraying of pulses on site
Zurich, CHE 2012 – 2013	ETH Zurich, Autonomous Systems Lab Prof. Roland Siegwart <ul style="list-style-type: none"> o 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 o Contributed to an innovative overlapping wheel configuration (patented!) for overcoming a broad variety of obstacles encountered in cargo ships including I-shaped stiffeners o 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

2018 – present	Harvard University , mentored and supervised several graduate and undergraduate students, taught and lectured in 2 AI/robotics classes (CS189 and CS289)
2017 – 2018	reach.ch , member of the reach-team for artificial intelligence, wrote an article on AI
2016 – present	ETH Alumni New England Chapter , board member, organized talks with ETH professors
2013	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
2010 – 2016	Wiler Forum for Sustainability Issues (WIFONA) , board member and vice president, organized forums with Swiss Federal Councilors for several hundred participants

Selected Publications & Patents (2 of 7)

- o F. Berlinger, J. Dusek, M. Gauci, R. Nagpal, Robust maneuverability of a miniature, low-cost underwater robot using multiple fin actuation. *IEEE Robotics and Automation Letters* 3, 140-147 (2017).
- o 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).

Fellowships & Awards

Financial Support, David B. Heller Innovation Fund (2019) • Certificate of Distinction in Teaching, Harvard University Bok Center (2018) • Best Paper Finalist, International Conference on Robotics and Automation (2018) • PhD Scholarship, Harvard University (2017 – present) • Fellowship, Janggen-Pöhn Foundation (2017) • Fellowship, Werner Siemens Foundation (2016) • Scholarship, Swiss Study Foundation (2015) • Best Innovator Award, Bühler Group (2013) • Fellowship, Swiss Study Foundation (2011 – present) • Graduation Award for First in Class, Wil High School (2010) • Sustainability Award for Best Matura Paper, Employer’s Association Wil (2010)