

Manuel Yves Galliker

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Robotics Engineer / Researcher / DIY Enthusiast and Maker / Open Source Developer

Passionate and results-driven with repeated success in translating theory into practice, considerable leadership abilities and the desire to push robotics towards real-world applications.

Education

ETH Zurich

Master of Science - MSc Mechanical Engineering

Zurich, Switzerland

September 2019– January 2022

ETH Zurich

Bachelor of Science - BSc Mechanical Engineering

Zurich, Switzerland

September 2014– August 2018

Military Service, Swiss Armed Forces

Squad leader of the fighter aircraft maintenance & ground operations team

Payerne, Switzerland

March 2014 - September 2014

Work Experience

Halodi Robotics

Senior Robotic Controls Engineer

Oslo, Norway

September 2022

Enabling the real world application of humanoid robots through the development of motion planning, control and autonomy algorithms with a focus on nonlinear Model Predictive Control, Whole-Body control and learning. (C++, Python, ROS, Nonlinear Systems and Control Theory, OCS2, Pinocchio)

Wingtra

Work Student Software & Industrialization Engineer, Part-time

Zurich, Switzerland

September 2019 - February 2020

Enhanced Quality control and reliability in the production of an VTOL drone for high precision aerial mapping through expansion of software automated data collection, analysis and process optimization with a focus on actuators. (KPI assessment, Python, Qt, Google Sheets API)

Wingtra

Development Engineer

Zurich, Switzerland

April 2019 - August 2019

Improved reliability KPIs of drone through leading various software hardware projects on automated temperature calibration of IMU, barometer and airspeed sensor and automated actuator test bench. (Project Management, Altium, Python, C++, P4, RPi)

Wingtra

Hardware Development Internship

Zurich, Switzerland

October 2018 - March 2019

Improved performance and reliability through extensive sensor evaluation, actuator redesign and debugging of the drone and roll-out of new manufacturing processes. (Rapid Prototyping, Matlab, Electric Circuit Analysis & Design, Solidworks)

Research and Academic Experience

Rehabilitation Engineering Lab, ETH Zurich

Civil Service Research Assistant Software Development

Zurich, Switzerland

February 2022- May 2022

Advanced robotic assessment and therapy of somatosensory hand movement of patients with neurological injuries through software development for UI and data analysis for an assistive device as a replacement for the mandatory military service. (C#, Unity3D, SQLite)

Master Thesis, AMBER Lab, Caltech, Robotics Systems Lab, ETH Zurich

Bipedal Locomotion through Nonlinear Model Predictive Control

Pasadena, California

July 2021 - January 2022

Achieved the first hardware demonstration of online gait generation under consideration of the full system dynamics on a bipedal robot through developing a whole-body Nonlinear Model Predictive Control approach. (C++, ROS, Nonlinear Systems and Control Theory, OCS2, Pinocchio, CppAd, Raisim)

Semester Thesis, Autonomous Systems Lab, ETH Zurich*Data-Driven Dynamics Modelling Using Flight Logs***Zurich, Switzerland***March 2021 - June 2021*

Build a software framework to identify the dynamics model of Unmanned Aerial Vehicles (multirotors, fixed-wing, VTOL) from PX4 Autopilot flight logs provided by the default onboard sensor suite. (Python, C++, Scikit Learn, CVXPY, Aerodynamics, Numerical Optimization, Gazebo, PX4)

Robotics Systems Lab, Autonomous Systems Lab, ETH Zurich*Teaching Assistant: Robot Dynamics***Zurich, Switzerland***September 2020 - February 2021*

Assisted for questions and exercise sessions for the master course. (Nonlinear Systems and Control Theory, Matlab)

Student Focus Project ftero, ASL and CMAS-Lab, ETH Zurich*Team Leader Controls and External Relations***Zurich, Switzerland***September 2017 - June 2018*

Leading the controls and mechatronics team to develop system modeling, controls, actuation, electronics and sensing for a prototype of an Airborne Wind Energy System. Online presence, media communication and sponsor relations. (Project Management, Control Theory, Aerodynamics, KiCAD, Power Electronics, C++, PX4)

Publications & Appearances

Bipedal Locomotion with Nonlinear Model Predictive Control:**IROS 2022 Preprint*****Online Gait Generation using Whole-Body Dynamics****March 2022*

M. Y. Galliker, N. Csomay-Shanklin, R. Grandia, A. J. Taylor, F. Farshidian, M. Hutter, A. D. Ames

Data-Driven Dynamics Modelling Using Flight Logs**PX4 Dev Summit, ETH Research Collection***Manuel Yves Galliker**September 2021*

Maintained as Open Source project: github.com/ethz-asl/data-driven-dynamics

Fast Prototyping Morphing Wings for Airborne Wind Energy**Airborne Wind Energy Conference**

M. Galliker, F. Schläfli, R. Bättig, M. Hensen, B. Kader, M. Macuglia,

October 2019

J. Mark, M. Pagani, P. Sigron, C. Zemp, Ur. Fasel, D. Keidel, A. Schlothauer and P. Ermanni

Personal & Technical Skills

- **Soft Skills:** Strong Communicator, Project Management, Teamwork, Public Speaking, Analytical Decision Making and Creative Problem Solving
- **Programming Languages:** Proficient in: C/C++, Python, Matlab, Shell, C#
- **Industry Software Skills:** Linux, Git, ROS, Docker, Matlab and Simulink, PX4, Altium, KiCAD, QT, Solidworks, Siemens NX, Unity3D, TeX, SQLite
- **Main Fields of Expertise:** Controls, Planning, Numerical Optimization, Embedded Programming, Circuit Design, Computer Vision, Machine Learning, Rapid Prototyping
- **Languages:** German (native language), English (proficient), French (fluent)

Leadership & Awards

- **President/Vice President and Treasurer of AMIV Bastli (2020 - 2021, 2016 - 2017):** Managing team, daily operations and external communication at the student Maker- and Hackerspace at ETH Zurich to foster the creativity, innovativeness and practical skills of fellow students.
- **HackZurich Finalist (2020):** Selected as one of the best 25 projects out of more than 300 submissions at Europe's largest hackathon.
- **SPHAIR Aviation Talents Graduate (2016):** Completion of the youth pilot selection of the Swiss Confederation by successfully mastering all aspects of flying a plane within two weeks.
- **Scout Leader (2010 - 2014):** Organizing various outdoor activities, summer and ski camps for children and teenagers in the local scouting group in Konolfingen.