

# 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

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**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](https://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

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- **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

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- **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.