Manuel Yves Galliker

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manuel-galliker • Oslo, Norway

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 — **Zurich, Switzerland**
MSc Mech. Engineering, Robotics, Systems and Controls — *September 2019– January 2022*

ETH Zurich — **Zurich, Switzerland**
BSc Mechanical Engineering — *September 2014– August 2018*

Military Service, Swiss Armed Forces — **Payerne, Switzerland**
Squad leader of the fighter aircraft maintenance & ground operations team — *March 2014 - September 2014*

Work Experience

1X Technologies — **Oslo, Norway**
Senior Robotic Controls Engineer — *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 machine learning. (C++, Python, Java, ROS2, Nonlinear Systems and Control Theory, OCS2, Pinocchio)

Wingtra — **Zurich, Switzerland**
Work Student Software & Industrialization Engineer, Part-time — *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 — **Zurich, Switzerland**
Development Engineer — *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++, Px4, RPi)

Wingtra — **Zurich, Switzerland**
Hardware Development Internship — *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 — **Zurich, Switzerland**
Civil Service Research Assistant Software Development — *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 — **Pasadena, California**
Bipedal Locomotion through Nonlinear Model Predictive Control — *July 2021 - January 2022*
Achieved the first hardware demonstration of online gait generation under consideration of the full system dynamics on a bipedal robot trough 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 **Zurich, Switzerland**
Data-Driven Dynamics Modelling Using Flight Logs *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 **Zurich, Switzerland**
Teaching Assistant: Robot Dynamics *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 **Zurich, Switzerland**
Team Leader Controls and External Relations *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: **IEEE-RAS Humanoids 2022**
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, Java, Matlab, Shell, C#
- **Industry Software Skills:** Linux, Git, TeX, ROS/ROS2, Docker, Matlab and Simulink, PX4, Altium, KiCAD, QT, Solidworks, Siemens NX, Unity3D, 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

- **Best Oral Paper Award Finalist (2022):** IEEE-RAS International Conference on Humanoid Robots for my work on "Bipedal Locomotion with Nonlinear Model Predictive Control: Online Gait Generation using Whole-Body Dynamics.
- **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.