

Manuel Yves Galliker

✉ manuel@galliker.tech • 📄 galliker.tech • 🌐 manumerous
📄 manuel-galliker • Sunnyvale, CA, USA

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

MSc Mech. Engineering, Robotics, Systems and Controls

Zurich, Switzerland

September 2019– January 2022

ETH Zurich

BSc Mechanical Engineering

Zurich, Switzerland

September 2014– August 2018

Military Service, Swiss Armed Forces

Squad leader of the fighter aircraft ground operations team

Payerne, Switzerland

March 2014 - September 2014

Work Experience

1X Technologies

Research Engineer Robotic Learning

Sunnyvale, CA, USA

June 2024

Research and development of autonomous locomotion and loco-manipulation behaviors for the humanoid robot Neo using reinforcement and imitation learning. (Python, C++, Pytorch, ONNX)

1X Technologies

Team Lead Controls and Embedded

Moss, Norway

September 2023 - June 2024

Leading and coordinating the successful bring up of our humanoid robot Neo from the first prototype to robust dynamic walking using NMPC and teleoperated hand control. Developed a reinforcement learning pipeline in NVIDIA Isaac Sim and set up initial C++ controls software stack including NMPC, RL Inference Controller, Joint Control API, MuJoCo Sim and CI pipeline. (C++, Python, Java, OCS2, Pinocchio, Pytorch, ONNX)

1X Technologies

Senior Robotic Controls Engineer

Oslo, Norway

September 2022 - August 2023

Developed a real-time motion planning framework for bipedal loco-manipulation using Whole-Body NMPC. Software development, testing and system integration of our custom made torque controlled REVO2 electrical motors using embedded Field Oriented Control (FOC). Growing the team by successfully hiring two controls and one firmware engineer. (C++, Python, Java, OCS2, Pinocchio, ROS2, EtherCAT)

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. (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. (Altium, Python, C++, Px4)

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, 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, RSL 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++, OCS2, Pinocchio, CppAd, Raisim, Nonlinear Systems and Control Theory,)

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, 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

Bipedal Locomotion with Nonlinear Model Predictive Control:

Online Gait Generation using Whole-Body Dynamics

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

IEEE-RAS Humanoids

March 2022

Data-Driven Dynamics Modelling Using Flight Logs

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ETH Research Collection

September 2021

Fast Prototyping Morphing Wings for Airborne Wind Energy

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

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

Airborne Wind Energy Conference

October 2019

Talks & Public Appearances

Towards General Loco-Manipulation Control for Legged Robots

Manuel Yves Galliker

Universität Freiburg

April 2024, Freiburg, Germany

Towards General Loco-Manipulation Control of the 1X Androids

Manuel Yves Galliker

IEEE-RAS Humanoids 2023

December 2023, Austin, TX

Workshop on Generalizable and Robust Decision Making, Planning, and Control for Humanoid Loco-Manipulation

Towards Automating Physical Labor in Human Spaces

Manuel Yves Galliker

Caltech

December 2023, Pasadena, CA

Towards Automating Physical Labor in Human Spaces

Manuel Yves Galliker

MIT

November 2023, Cambridge, MA

Personal & Technical Skills

- **Soft Skills:** Strong Communicator, Project Management, Teamwork, Public Speaking, Analytical Decision Making and Creative Problem Solving
- **Programming Languages:** Proficient in: Modern C++, C, Python, Java, Matlab, Shell, C#
- **Industry Software Skills:** Linux, Git, NVIDIA Isaac Sim and Omniverse, MuJoCo, Pytorch, Tensorboard, Docker, Matlab and Simulink, TeX, ROS/ROS2, PX4, Altium, KiCAD, QT, Solidworks, Siemens NX, Unity3D, SQLite
- **Languages:** German (native), 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 Swiss 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.