Jannes Hühnerbein

✉ hjannes@ethz.ch | 🌐 huehnerbe.in | in jhuehnerbein | ⭘ janneshb

Education _____

Swiss Federal Institute of Technology Zurich (ETH Zurich)   *Zurich, Switzerland*

ROBOTICS, SYSTEMS AND CONTROL MSc   *Sep 2022 — Nov 2024*

- *Master's Thesis:* Uncertainty Model Unfalsification via Semi-Infinite Programming and Local Reduction
- *Semester Project:* Diffusion Spline-Based Navigation Policy in Dynamic Environments
- *Core Courses:* Linear System Theory, Dynamic Programming and Optimal Control, Recursive Estimation, Model Predictive Control, Vision Algorithms for Mobile Robotics, Nonlinear Dynamics and Chaos, Introduction to Machine Learning
- *Additional Courses:* Advanced Model Predictive Control, Convex Optimization, Probabilistic Artificial Intelligence, Orbital Dynamics

MECHANICAL ENGINEERING BSc   *Sep 2018 — Oct 2021*

- *Thesis:* Distributed Trajectory Planning for Multiple Autonomous Aerial Vehicles
- *Core Courses:* Calculus, Linear Algebra, Mechanics, Dynamics, Physics, Thermodynamics, Fluid Mechanics, Electrical Engineering, Informatics
- *Electives:* Control Systems, Signals & Systems, System Modeling, Advanced Topics in Control, Quantum Mechanics, Models, Algorithms and Data

Gymnasium Raabeschule   *Braunschweig, Germany*

ABITUR (GERMAN UNIVERSITY-ENTRANCE QUALIFICATION)   *graduated in June 2017*

- Salutatorian
- *Advanced Courses* (German *"Leistungskurse"*): Mathematics, Physics, Chemistry

Research & Work Experience _____

Control and Power Research Group, Imperial College London   *London, United Kingdom*

MASTER'S THESIS   *Apr 2024 — Nov 2024*

- *Title:* Uncertainty Model Unfalsification via Semi-Infinite Programming and Local Reduction
- Conducted as a visiting student under supervision of Prof. Dr Eric Kerrigan
- Explored the use of optimization problems (semi-infinite programs in particular) and data to inform uncertainty models
- Developed a Julia package for dynamical systems simulation called 🔗 `SimpleSim.jl` available on the Julia registry

Robotic Systems Lab, ETH Zurich   *Zurich, Switzerland*

SEMESTER PROJECT   *Oct 2023 — Feb 2024*

- *Title*: Diffusion Spline-based Navigation Policy in Dynamic Environments
- Investigated the use of denoising diffusion probabilistic models (DDPMs) for spline-based robot navigation

Zipline International Inc.   *South San Francisco, California, USA*

GUIDANCE, NAVIGATION AND CONTROL INTERN   *Sep 2021 — Aug 2022*

- Supported development work on guidance, navigation and controls algorithms for a novel autonomous aircraft
- Worked extensively with Julia (for simulation) and C++ (for prototyping and embedded systems)
- 🔗 What I worked on (YouTube)

Institute for Dynamic Systems and Control, ETH Zurich   *Zurich, Switzerland*

BACHELOR'S THESIS   *Summer 2021*

- *Title:* Distributed Trajectory Planning for Multiple Autonomous Aerial Vehicles
- Developed a distributed trajectory planner using ADMM and ALADIN and contributed to the 🔗 CRS framework

Academic Space Initiative Switzerland (ARIS)   *Zurich & Dübendorf, Switzerland*

CONTROL SYSTEMS ENGINEER   *Sep 2020 — Aug 2021*

- Two-semester project with the goal of developing an autonomous guided recovery system for a student rocket
- Worked with a team of eight students from different fields and universities
- Developed a fully functional embedded control system from the ground up
- 🔗 Link to ARIS Website

ETH Zurich   *Zurich, Switzerland*

TEACHING ASSISTANT FOR SIGNALS & SYSTEMS, MECHANICS 1 & 2 AND DIMENSIONING 1   *Feb 2020 — Feb 2024*

- Independently taught weekly classes of approx. 25 students
- Prepared practice material and exercise sessions
- Supported lectures by preparing slides, grading assignments and monitoring online forums

Honors & Awards

2020 — 2024	**Scholarship Recipient** 🔗 More Information in English	*German National Academic Foundation*
May 2019	**1st Place** Innovation Project ("Innovationsprojekt"), 🔗 Information in German	*ETH Zurich*
Jul 2017	**High-School Graduate Prize** 🔗 More Information in German	*German Physical Society*

Specialized Skills

Programming	Julia, Python, C++, C
Robotics	MATLAB/Simulink, ROS, Gazebo, Eigen, PyTorch
Optimization	JuMP, CasADi, FORCESPRO, Acados, CVXPY
Hardware	RaspberryPi, Arduino, STM32, ESP32
Other	Git, Linux, LaTeX, Siemens NX, SQL, PHP, Javascript (…)

Other

Languages	German — Native Proficiency English — Full Professional Proficiency French — Elementary Proficiency
Volunteering	Mentoring-Program for First-Semester Students at ETH Zurich *2020 / 2021* Advisor for Digital Infrastructure & IT at Youth Against AIDS (Jugend gegen AIDS e. V.) *2014 — 2017*