Yannik Werner

Curriculum Vitae

Binzmühlestrasse 14
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CH/DE

Education

Sep 2022 – **present** **Master of Science in Robotics, Systems and Control**.
ETH Swiss Federal Institute of Technology, Zürich

Focus: Optimisation, Simulation & Modeling

Main Courses: Dynamic Programming & Optimal Control,
Planning and Descision Making for Autonomous Robots, Vision Algorithms for Mobile Robots,
Control Systems, Recursive Estimation

Sep 2019 – Aug 2022 **Bachelor's degree in Physics**.
ETH Swiss Federal Institute of Technology, Zürich

Main Courses: Astrophysics I, Quantum Mechanics I & II,
Quantum Electronics, Classical Mechanics, Theory of Heat, Electrodynamics,
Methods of Mathematical Physics II

Project Experience

Oct 2024 – **present** **"Fair & Efficient Investment Cost Distribution in the European Railway System"**, *ETH Zürich*.
Masterthesis at Institute for Dynamic Systems and Control

Mechanism Design (Game Theory), Application of Optimization Techniques, Railway Network Modeling, Calibration using real-world Data

Sep 2023 – Feb 2024 **"Boulder Excavation Using Reinforcement Learning"**, *ETH Zürich*.
Semester Project at Robotics Systems Lab

Implementation, Extension and Benchmarking (in Python) of Soil Model with Rigid Bodies (boulders) for deployment of excavators in inhomogeneous soil

Mar 2023 – Dez 2023 **Bi-liquid Rocket ODYSSEY**, *ARIS Space*.
Trajectory Simulation Engineer

Development of Trajectory Simulation Tool (in Python) for predicting behavior and stability of rockets during ascent

Sep 2021 – Aug 2022 **Hybrid Rocket HELVETIA**, *ARIS Space*.
Trajectory Simulation Engineer

Application of trajectory simulation tools like OpenRocket or RocketSim and Data Analysis (in Python) on trajectory simulation data to support rocket design decisions
Rocket and Terrain Graphics Generation (in JavaScript) based on rocket position for the Live-stream of the Rocket Launch

Jan 2021 – Apr 2021 **"Cs-Magnetometer Data Read-Out and Analysis"**, *Paul Scherrer Institute (PSI)*.
Semester Project at Institute for Particle and Astrophysics

Implementation of real-time Cs-magnetometer read-out (in C++) to determine the magnetic field strength inside the neutron precession chamber & parallelizing code for performance optimisation

Work Experience

Mar 2024 – Aug 2024 **Interface Engineer**, *ESOC, ESA*, Darmstadt.
Internship at Mission Analysis Section

Design and Implementation of Interface (in Python) between MA software (GODOT) and MBSE Tools (Cameo SysModeler) to automatize the execution of simulations and distribution of results.

Jun 2023 – Feb 2024 **Teaching Assistant**, *D-MAVT, ETH Zürich*.
Course: Planning and Decision Making for Autonomous Robots

Development of Sequential Convex Optimisation Exercise (in Python) for evaluation of students performance in the class

Jan 2019 - Jun 2019 **NBC Defence Corps, Biology Laboratory**, *Recruit School ABC Abw RS 77, Spiez*.

Programming Skills

Python Scientific Applications and Data Analysis (including NumPy, SciPy, pandas, matplotlib)

Optimisation, Machine Learning, Modeling and Control (including CVXPy, PyTorch)

API Development, DB Engineering, Notification Templating (including requests, FastAPI, SQLite, Jinja)

Git & Docker Version Control

HTML/CSS Web Development

JavaScript Creating Graphics (using p5.js)

Dashboard Development

C++ Parallel Computing

Linux & Windows Experienced User

Analytical Skills

Strong Mathematical and Physical Foundation

Numerical Mathematics

Optimisation, State Estimation, Vision Algorithms and Control Algorithms

Statistics and Machine Learning

Rocket Dynamics, Orbital Dynamics and Environmental Modeling

Simplifying and Conveying Physics Concepts

Scientific Writing

Data Visualisation and Analysis

Language Skills

German Mother tongue
English Proficient user
French Independent user
Spanish Beginner
Italian Beginner