SEBASTIAN HECKERS

Computational Science and Engineering MSc Student

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EDUCATION

MSc Computational Science and Engineering
📅 Jan. 2024 - present   📍 ETH Zürich

BSc Computational Science and Engineering
Specialisation Robotics
📅 Sep. 2020 - Jan. 2024   📍 ETH Zürich

Matura
Focus on physics and application of mathematics
📅 Aug. 2016 - Juni 2020   📍 Kantonsschule Heerbrugg

School Graduation
📅 Aug. 2007 - Juni 2016   📍 School Altstätten

ADDITIONAL EXPERIENCE

Student Teaching Assistant for Systems Programming & Computer Architecture
📅 HS 2022, 2023 & 2024   📍 ETH Zürich

Volunteer at the Platform for Advanced Scientific Computin (PASC)
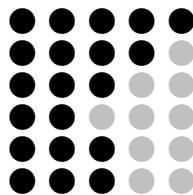📅 July 2023 & 2024   📍 Davos, Suisse

COMPUTER SKILLS

C, C++	⚫⚫⚫⚫⚫
Python	⚫⚫⚫⚫⚪
Julia, Fortran, Matlab	⚫⚫⚫⚪⚪
HTML, CSS, Java	⚫⚫⚪⚪⚪
Bash Scripting	⚫⚫⚫⚪⚪
Linux (Ubuntu)	⚫⚫⚫⚪⚪

LANGUAGE

German	⚫⚫⚫⚫⚫
English	⚫⚫⚫⚫⚫
French	⚫⚫⚪⚪⚪
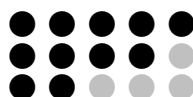
PROJECT EXPERIENCE

Dataset Generation of Multi-Material Deformable Objects
Semester Thesis
📅 FS 2024   📍 CRL, ETH Zürich

- A pipeline for the generation of multi-material objects and their simulations is created for reinforcement learning of robitic policies.

Variants of Operator Learning
Research Project
📅 FS 2024   📍 ETH Zürich

- The different methods of operator learning, Neural Operatos, Transfromers and more, and their applications are summerized and analysed.

High-level, Mid-level, and Low-level GPU Programming Comparison
Course Group Project
📅 FS 2024   📍 ETH Zürich

- Implementation and compairison of a simple numerical method on various level of GPU programming, including CUDA, OpenACC, CuPy and GT4Py.

Let the best sim win!
Bachelor Thesis
📅 HS 2023   📍 CRL, ETH Zürich

- Benchmarking deformable object simulation.
- Various simulation frameworks like MuJoCo or IsaacGym were tested and evaluated for the simulation of 3D bodies undergoing deformations though robotic systems.

Position-Based Fluid
Course Group Project
📅 HS 2022   📍 ETH Zürich

- The whole project contains implementations of position based fluids, collision functions of both static and dynamic spheres and boxes, rigid body under unified particle system using Taichi Lang as framework.

High Performance Computing for Science and Engineering
Course Projects
📅 2022 - 2023   📍 ETH Zürich

- Implementation and resampling of different programs to achieve high performance and analyze the results and the scaling.
- An example task is a scalable PDE solver application.

Systems Programming & Computer Architecture

Course Projects

📅 HS 2021   📍 ETH Zürich

- Implementations of different system level programs and experience computer architecture vulnerabilities.
- Programs for Virtual Memory, Floating Point Operations and Device Drivers were implemented in C.

Simulation-based shape optimization

Matura Thesis

📅 2019   📍 Kantonsschule Heerbrugg

- In this project, an optimization algorithm for a structural optimization with the adaptive growth optimization method is programmed.
- The Finite Element program ANSYS is used to analyze the model and Python was used to write the program.

HOBBIES

- Sports (athletics)
- Skiing (J+S leader)
- Paragliding