SEBASTIAN BAUER

Website ⋄ Github ⋄ LinkedIn

EDUCATION

Technical University of Munich   April 2022 - Present
M. Sc. Computer Science
Courses: NLP, ML on Graphs, DL for Computer Vision

University of Passau   October 2018 - April 2022
B. Sc. Computer Science
Courses: Distributed systems, Efficient Algorithms

PROJECTS

University Project: NeRF based Surface Reconstruction   January 2023 - September 2023

- · extended nerfstudio pipeline to improve surface reconstruction capabilities
- · altered network architecture and designed custom optimization objective
- · decrease of Chamfer distance by 4; Improvement of PSNR by $> 2dB$ (compared to baseline)

  Tech stack: *Python, git, PyTorch, Computer Vision*

University Project: Stereo Reconstruction   May 2022 - August 2022

- · developed a stereo reconstruction pipeline in C++ with two fellow students during semester ($\approx$ 12h/week)
- · used the Eigen and Ceres libraries for SVD decomposition and OpenCV for keypoint detection/image rectification

  Tech stack: *C++, Ceres, Eigen, OpenCV, Docker, git, numerical algorithms/stability*

Thesis: Feature extraction using Variational Autoencoders   September 2021 - February 2022

- · developed a novel approach for dimensionality reduction and feature extraction in CT scans
- · derived custom loss function for decoder to avoid blurry and incorrect reconstructions
- · achieved a compression factor of 20 with little loss of detail
- · presented my work to researchers of the FORWISS image processing institute

  Tech stack: *Python, Numpy, Pandas, Tensorflow/PyTorch, git, SQL, LaTeX, Linux, Docker*

Software Engineering Lab   February 2021 - August 2021

- · designed, implemented and tested a complex online library system ($>$ 30k LoC)
- · responsible for database access, OR mapper, e-mail dispatch and maintenance dameon
- · extensive documentation for every milestone and report to supervisor every week
- · project lead in design and validation phase; presented project in final demo

  Tech stack: *Java EE, SQL, CSS, HTML, jUnit, Selenium, GraphWalker, Dependency Injection*

PERSONAL PROJECTS

C89-- Compiler   April 2022 - Present

- · designed and developed a recursive-descent compiler that compiles a subset of C89 to x86 assembly ($>$ 4500 LoC)
- · integration of constant propagation optimization
- · planning on implementing function call dependency visualization with GraphViz and additional optimizations

  Tech stack: C, Make, Graphviz, git

Other side projects   October 2018 - Present

- · Rubiks's cube solver using Thistlethwaite's algorithm and ID-DFS
- · diff command reimplementation using dynamic programming and hashing
- · multithreaded path raytracer with simple lighting model using SFML media library
- · distributed log service in Golang using protobuf and gRPC
- · TCP/IP stack using Linux TUN/TAP devices

SKILLS

Programming Languages	C++, C, Java/Kotlin, Python, Go, Bash
Operating systems	Linux
Frameworks and Libraries	d3.js, NumPy, OpenCV, Pandas, TensorFlow/PyTorch, SciPy, Processing, OpenMP, MPI, Redis DB, PostgreSQL, protobuff, gRPC, Docker

MISCELLANEOUS

First place in the regional Bavarian mathematics competition   2013, 2014

· solved problems with a fellow student
· invitation from the school principal and interview with local press

Science fair coordinator   2015 - 2016

· designed, prepared and conducted experiments to excite children about science

Art exhibition   2016

· Exhibition of my paintings in city hall

LANGUAGES

· English (TOEFL Score 107/120 (C1))
· German (native)