MAX FRUEHAUF

Master's from ETH with a knack for working at the intersection of computer vision and geometry processing.

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ACADEMIC EXPERIENCE

Differentiable Quad Meshes from Images

Master's Thesis, Disney Research | Studios & ETH Mar – Sep 2023

- Designed, built, and validated a differentiable method extracting quad-dominant meshes from posed images. Resulted in a CVPR submission.
- Built differentiable subdivision and displacement methods to extract pixel-level details in geometry with lightweight meshes.

Tracking Moving Objects with NeRFs

Semester Project, Autonomous Sys. Lab, ETH Aug 2022 – Jan 2023

- Integrated object tracking on sparse features with a NeRF representation for simultaneous object reconstruction while tracking.
- Worked on weakly supervised object segmentation from semantic features to serve as a prior for 2D object tracking.

Texture-Rich Mapping from RGB-D Images

Semester Project, Robotic Sys. Lab, ETH Feb – Jun 2022

- Implemented a real-time voxel-based map representation decoupling high-resolution textures and geometry in C++ / CUDA.
- Collaborated with the original authors of NVIDIA nvblox.

PROFESSIONAL EXPERIENCE

Computer Vision Research Intern

Disney Research | Studios Oct 2023 – Mar 2024

- Extended my thesis on mesh extraction ultimately leading to a submission at CVPR 2024.
- Lead the team's efforts on processing movie data. In Python & Pytorch.
- Trained and validated monocular depth prediction nets for tech transfer.

Robotic Telepresence Intern

Roboy Humanoid Robot, Devanthro GmbH Apr – Sep 2021

- Developed hard- and software used at the ANA Avatar XPRIZE Semi Finals 2021 held in Miami, FL.
- Integrated haptic feedback gloves (SenseGlove), developed human presence detection system & Oculus VR training in Unity.

Research Assistant

Cyber-Physical Systems Group, TUM Oct 2020 – Mar 2021

- Integrated a vehicle simulation framework SUMO and with the AV research platform CommonRoad.
- Assured software quality. Worked on actively used research libraries.

PUBLICATIONS

Conference Proceedings

- **M. Frühauf**, H. Riemenschneider, M. Gross, and C. Schroers, "Quadify: Extracting meshes with pixel-level details and materials from images," in *Under review for publication at CVPR 2024*.

EDUCATION

M.Sc. Robotics, Systems, and Control

ETH Zürich Sep 2021 – Dec 2023

Focus on CV/CG & ML. **GPA↑: 5.9/6.0**
Passed with distinction. Key Courses: Deep Learning for AVs, Vision Algorithms, Computer Graphics, Machine Perception.

B.Sc. Computer Science

Technical University of Munich (TUM)
Oct 2017 – Mar 2021

Minor in Math. **GPA↓: 1.7/5.0, Top 10%**

Exchange Semester

National University of Singapore (NUS)
Aug – Dec 2019

SKILLS

Python | PyTorch | CUDA | git | C++ | Machine Learning | LaTeX | Neural Rendering | Geometry Processing

LANGUAGES

German (native) | English (TOEFL 117/120) | French (basic) | Chinese (basic)

HONORS

German Academic Scholarship
Deutschlandstipendium
For high-achieving and committed students 2018, 2019.

TUM Informatics Tutoring Award
Preis für die beste Lehre
Twice for tutoring students, 2020.

SERVICE

- Reviewer of short papers and posters for SIGGRAPH Asia 2023.
- Tutored students at TUM in introductory courses in computer networks, databases, and computer architecture.