MATIAS TURKULAINEN

MSC ROBOTICS, SYSTEMS AND CONTROL

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Profile

MSc student in Robotics at ETH Zurich focused on 3D Computer Vision and Graphics.

Education

ETH Zurich

Zurich, Switzerland

MSc Robotics, Systems and Control

2021-2024

Semester Project: Object 3D shape reconstruction from RGB-D images using trained shape priors. A small demo is available.

Relevant Coursework: Vision Algorithms for Mobile Robots 5.5/6, Image Analysis and Computer Vision 5.25/6, Robot Dynamics 5.25/6, Introduction to Machine Learning 5.25/6, Computational Models of Motion 5.25/6, Computer Graphics, Mixed Reality 5.75/6, Machine Perception, and Seminar in Advanced Topics in Vision 5.75/6.

University of Glasgow

Glasgow, Scotland

BEng (Hons) in Mechanical Engineering with Aeronautics

2017-2021

Grade: 1st class honours. Cumulative GPA: 20.5/22. Bachelor's project: "Comparison of SLAM Algorithms for Drone Operations" using ROS + Gazebo simulations.

Employment

Research Assistant

Aalto University

Dec 2023 -

Project related to 3D Gaussian splatting. Contributed to gsplat.

Research Intern

VTT Technical Research Centre of Finland

April 2023 - Nov 2023

Working on inverse rendering. Project related to fusing rgb + hyperspectral imaging into hyperspectral radiance fields for material classification in 3D. Contributing to the open-source Nerfstudio project. Also worked on camera pose refinement with BARF-nerfstudio and the various problems of registering poses of rgb and hyperspectral images.

Research Assistant

Computer Vision and Learning Group (VLG), ETH Zurich

Feb 2022 - July 2022

Project related to human pose estimation from images. Data set capture of social interactions using Microsoft Hololens and data processing of OpenPose and AMASS 2D/3D keypoints with Python. The work led to a publication: EgoBody.

Drone Systems Trainee

Nokia

Jun 2020 - Aug 2021

R&D intern at Nokia working with LTE connected drones. System level testing and analysis of experimental hardware/software. Worked on camera based precision landing with Jetson Nano and OpenCV.

Open-source projects

gsplat

https://docs.gsplat.studio

Together with researchers and students at Berkeley BAIR lab, we modularized and reimplemented the influential "3D Gaussian Splatting for Real-Time Radiance Field Rendering" paper from SIGGRAPH 2023. gsplat contains Python bindings for various lower level CUDA kernels allowing easier experimentation and research in conventional Python based workflows.

Nerfstudio

https://docs.nerf.studio

Maintainer and contributor to the open-source NERF project which is trying to bring the latest tech in 3D neural reconstruction to devs and other users. My work includes bug fixes, help with issues and questions, and some major overhauls like this PR. I also worked on camera optimization with BARF-nerfstudio and created a template for other devs to expand on.

Skills

Python	C++	CUDA
Linux	Blender	Packages: PyTorch, OpenCV, Open3D

Links

Website: https://maturk.github.io

GitHub

LinkedIn