Mertcan Akçay

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Education

ETH Zurich — Zurich, Switzerland
Master of Science in Robotics, Systems and Control — *Sept 2021 – Present*

Bilkent University — Ankara, Turkey
Bachelor of Science in Electrical and Electronics Engineering, CGPA: 3.93/4.00 — *Aug 2017 – June 2021*

Nanyang Technological University — Singapore
Exchange Student in Electrical and Electronic Engineering — *Jan 2020 – May 2020*

Experience

Robotics and Perception Group — Zurich, Switzerland
Master Thesis — *June 2023 – Present*

- Conducting research on self-supervised learning methods to teach robots to navigate autonomously in real world by leveraging passive egocentric videos.

ETH Zurich — Zurich, Switzerland
Teaching Assistant — *August 2023 – Present*

- Preparing a project for the course Probability and Machine Learning which will be offered as a core course of the Mechanical Engineering bachelor program.

Disney Research | Studios — Zurich, Switzerland
Research Intern — *Sept 2022 – Mar 2023*

- Worked on multimodal machine learning architectures to perform audio-to-video synchronization on in-the-wild videos. Outperformed SOTA methods with a significantly smaller model.

ETH Media Technology Center — Zurich, Switzerland
Research Assistant — *Nov 2021 – Aug 2022*

- Developed a face tracker which approximates the 3D models of people's heads by training a deep neural network using face images and a 3D Morphable Face Model.
- Developed a pipeline for generating synthetic photo-realistic videos of people given an arbitrary source audio recording.

Robotics and Perception Group — Zurich, Switzerland
Semester Thesis — *Nov 2021 – Apr 2022*

- Implemented a communication interface between a drone and an offboard computer for low-latency communication which makes it possible to have more agile autonomous drones with higher thrust-to-weight ratios.
- Trained reinforcement learning policies in a simulated environment to fly the agile drone in a racing arena autonomously and successfully tested these policies in real world.

Publications

- Ayça Takmaz*, Jonas Schult*, Irem Kaftan†, Mertcan Akçay†, Bastian Leibe, Robert Sumner, Francis Engelmann, and Siyu Tang. "3D Segmentation of Humans in Point Cloud with Synthetic Data". In: International Conference on Computer Vision (ICCV), 2023.

Projects

Interactive Exploration for Mapping | *Perception and Learning for Robotics Course Project* Mar 2022 - June 2022

- Trained an autonomous agent in simulation using reinforcement learning to make it learn how to interact with the environment such that it can create more accurate instance-level maps of the scenes.

Monocular Visual Odometry | *Vision Algorithms for Mobile Robotics Course Project* Dec 2021 - Jan 2022

- Developed a monocular visual odometry pipeline to estimate local trajectories of moving agents using camera images and tested its performance on publicly available and custom datasets.

Human-Machine Collaboration Using AR | *Mixed Reality Course Project* Oct 2021 – Jan 2022

- Developed an app for HoloLens 2 to visualize and plan changes on the real world terrain data so that these changes can be deployed on the autonomous walking excavator.

Autonomous Robot | *Bachelor Thesis* Sept 2020 – June 2021

- Created an autonomous robot which is able to perform target detection via scene matching and navigation via fusion of LIDAR and stereo camera.
- Implemented scene matching algorithms using feature matching, and worked on SLAM.

Optimal Undersampling for Diffusion MRI | *Individual Research Study* Feb 2021 – June 2021

- Conducted research on improving under-sampled MRI images using deep learning and worked on acquiring optimal under-sampling patterns for diffusion MRI to decrease MRI scan times.

Skills

Languages: Turkish (native), English (fluent), German (beginner)
Programming: Python, C++, MATLAB, Java, ROS, PyTorch

Honors & Awards

Bilkent University Academic Excellence Award: Awarded at graduation based on CGPA
Bilkent University High Honor Rolls in 2017-2021
Bilkent University Comprehensive Scholarship: Full tuition waiver & stipend during the BSc program
KYK Scholarship of the Republic of Turkey: Awarded monthly stipend during the BSc program due to the success at university entrance exam
Nationwide University Entrance Exam: Ranked 75^{th} among 2 million students in Turkey, 2017