Irem Kaftan

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Education

ETH Zurich — Zurich, Switzerland
Master of Science in Electrical Engineering and Information Technology — *Sept 2021 – present*

Bilkent University — Ankara, Turkey
Bachelor of Science in Electrical and Electronics Engineering, CGPA: 3.92/4.00 — *Sept 2017 – June 2021*

Bilkent University — Ankara, Turkey
Minor in Psychology, CGPA: 3.90/4.00 — *Feb 2019 – June 2021*

Experience

Sevensense Robotics — Zurich, Switzerland
Robotic Systems Intern — *July 2022 – present*

- Performing end-to-end tests on the software stack of the products and improving test automation by designing and implementing new features.

ETH AI Center — Zurich, Switzerland
Research Assistant — *Jan 2022 – June 2022*

- Generated custom speech using text-to-speech (TTS) algorithms with the goal of combining it with a deepfake human avatar to present a constructive message as part of an AI+Art project.

Neurotechnology Group — Zurich, Switzerland
Semester Project — *Mar 2022 – July 2022*

- Introduced a noninvasive and restrained free eye tracking setup and implemented a face detection algorithm that runs in real-time to study visual attention in common marmosets.

Imaging and Computational Neuroscience Laboratory — Ankara, Turkey
Undergraduate Researcher — *Mar 2019 - June 2021*

- Observed the active regions of the subject's brain under fMRI while the subject was listening to stories and converted 3-dimensional fMRI data to 2-dimensional flatmaps by using Freesurfer.

ASELSAN — Ankara, Turkey
Research and Development Intern — *June 2020 – Aug 2020*

- Implemented C code for some user interface (UI) and back-end modifications of the STKC-8250 calibration device, which is used to calibrate the STC-8250 digital tachograph.

Integrated Systems and Systems Design (ISSD) — Ankara, Turkey
Research and Development Intern — *Aug 2019 – Sept 2019*

- Implemented an end-to-end plate detection and plate number recognition system using the YOLOv3 algorithm and ran the system on Jetson Nano to test it with real-time video streaming.

Publications

- Ayça Takmaz*, Jonas Schult*, **Irem Kaftan**†, Mertcan Akçay†, Bastian Leibe, Robert Sumner, Francis Engelmann, and Siyu Tang (2022). "3D Segmentation of Humans in Point Cloud with Synthetic Data". In: arXiv:2212.00786.

- **Irem Kaftan***, Özgür Bora Gevrek*, and Tolga Cukur (2021). "Synergistic Reconstruction-Synthesis of Multi-Contrast MRI using Transfer Learning Method". In: 29th Signal Processing and Communications Applications Conference (SIU).

Projects

Learning to Segment Humans in 3D Scenes | *Virtual Humans Course* *Feb 2022 – June 2022*

- Proposed a pipeline to augment 3D indoor datasets with synthetically generated humans and real human scans.
- Devised a method for segmenting humans in depth scans rendered from the populated 3D scenes.

Interactive Exploration for Mapping | *Perception and Learning for Robotics Course* *Feb 2022 – June 2022*

- Introduced a reinforcement learning framework to encourage an agent to navigate in an unknown environment and to interact with objects to perform more complete object-level mapping.
- Implemented a bridge between the reinforcement learning and the mapping framework to exchange information.

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

- Implemented a monocular visual odometry pipeline which can initialize 3D landmarks, track keypoints between frames, estimate the pose using 2D $\leftrightarrow$ 3D correspondences, and triangulate new landmarks.

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

- Developed an AR app for HoloLens 2 to align georeferenced data of a site with its real world location and edit the data to plan changes on site with the goal of combining it with an autonomous walking excavator.

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

- Constructed an autonomous robot which can navigate in an unknown environment and locate a target by using the data coming from a LIDAR, a stereo camera, and an INS.
- Implemented C++ code in ROS to perform motion planning, navigation, and exploration.

Skills

Programming: Python, C++, MATLAB, ROS, PyTorch
Languages: Turkish (native), English (fluent: C2/TOEFL: 117), German (intermediate: B1)

Honors & Awards

Bilkent University Academic Excellence Award: Awarded to top 10 students based on graduation CGPA.
Bilkent University Full-Merit Scholarship: Awarded to top 1 % of students based on CGPA.
Bilkent University High Honor Rolls (2017 - 2021): Awarded to students with a CGPA above 3.50/4.00.