# 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** | *Senior Year Project* *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.