MELIH AKAY

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OBJECTIVE

Dedicated and highly motivated individual with a profound passion for advancing the field of autonomous ground vehicles and robotics. Eager to contribute innovative solutions that redefine conventional perspectives. Possess foundation in statistics, mathematics, and programming, with a particular focus on machine learning and robotics.

EDUCATION

Middle East Technical University *Sep 2022 - Jul 2026*
B.Sc. in Statistics *Ankara, Turkey*

After two years in physics, I have shifted my focus from physics to statistics, ranking in the top 20% in my cohorts in physics and statistics.

Member of METU Robotics Society and Jazz Club

EXPERIENCE

Ford Otosan November 2024 - Ongoing
Perception Software Engineering Long Term Intern *Ankara, Turkey*

- Working on development of an unified deep learning framework integrating LiDAR and camera models in PyTorch, with primary focus of modularity between models.
- Developed and implemented a clustering-based LiDAR semi-annotation pipeline that is been used as a fallback in case of ML-model failure.

July 2024 - August 2024
Perception Software Engineering Intern *Ankara, Turkey*

- Conducted in-depth research on the state-of-the-art LiDAR semi-annotation methods and contributed to the develpment of point cloud semi-annotation pipeline.
- Explored potential applications of foundation models such as SAM in the context of point cloud semi-annotation.

METU Robotics and Artificial Intelligence Research Center November 2024 - Ongoing
Undergraduate Research Fellow *Ankara, Turkey*

- Designing and implementing a high-performance swarm robotics simulator based on Isaac Sim, enabling large-scale multi-robot simulations for collaborative behavior research.

METU Formula Racing Sep 2024 - Ongoing
Software Engineering Lead *Ankara, Turkey*

- Leading software design and development process of an autonomous race car by managing Driverless and Embedded Software teams.
- Designing end-to-end pipeline for high-performance autonomous racing.
- Ensuring the production of clean and readable code-base. Utilizing UML diagrams and semantic versioning. Experienced in Scrum and Agile methods.
- Currently working on CUDA and Python CUDA solutions.

Sep 2023 - Sep 2024
Driverless Team Lead *Ankara, Turkey*

- Designed and implemented complete autonomous driving stack, including perception, estimation, localization, planning and control submodules.
- Actively developed software with Python and C++, mainly for micro-controllers and ROS packages.

- Experienced in sensor fusion for both state estimation (IMU, GPS, visual/wheel odometry) and visual sensor fusion (LiDAR, Camera).
- Developed local planning algorithm using Delaunay triangulation and implemented SLAM solutions for both simulation and real vehicles.
- Optimized embedded systems development with various communication protocols (CAN, UART, SPI, I2C), achieving 180x performance improvement in task scheduling. Experienced with various sensors and motor controls.
- Led system-wide transition from ROS to ROS2, containerized entire stack for cross-platform compatibility across Jetson (AGX Xavier, TX2, Nano) devices.

Sep 2022 - Sep 2023
Perception Chapter Lead *Ankara, Turkey*

- Designed and implemented perception stack, from scratch, utilizing Ouster OS1 LiDAR and ZED stereo camera for object detection and sensor fusion.
- Managed the project development of the perception system and collaborated closely with other team leaders while conducting research on perception systems for autonomous robots.

Salesart Jun 2022 - Jan 2023
Data Science Intern *Istanbul, Turkey*

- Developed an end-to-end ML-based product recommendation system with an API and a dashboard for customers.
- Worked on real-world sales data from P&G and SC Johnson.
- Conducted research on supply chain & demand forecasting algorithms.

PROJECTS

Wheelie: An End-to-End Autonomous Racing Framework for Formula Student Driverless Competition
Apr 2022 - Present

- Design and development of autonomous racing software & hardware for Formula Student electric race cars DEVRIM23 and DEVRIM25.
- Granted undergraduate research grant by AdımODTÜ in 2023 Spring term.
- Sponsored by Ford Otosan, ADASTEC, Leo Drive, FNSS, Pepperl Fuchs and the other valuable sponsors.

PROFESSIONAL SKILLS

Operating Systems	Linux, Linux4Tegra
Computer Languages	Python, C++, MATLAB, Bash, PostgreSQL, MySQL
Frameworks & Libraries	ROS, ROS2, Open3D, PCL, OpenCV, PyTorch, pandas, numpy, seaborn, scipy, scikit-learn
Tools	Docker, Git, Bitbucket, Azure, Foxglove Studio, Tableau, PyCharm, Datagrip, DBeaver