Baris Sarper Tezcan

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Education

Middle East Technical University — Ankara, Turkey

B.Sc. in Computer Engineering; ***CGPA: 3.91/4.00; Ranked: 4th out of 318*** — *Sep 2019 – June 2024*

Double Major in Mathematics; ***CGPA: 3.82/4.00*** — *Sep 2022 – Jan 2025*

Research Experience

Middle East Technical University — Ankara, Turkey

Undergraduate Researcher — *Sep 2022 – Sep 2023*

- Worked with Assoc. Prof. R. Gokberk Cinbis on weakly supervised semantic segmentation (WSSS) using the PASCAL VOC 2012 dataset, employing only image-level labels as weak supervision.
- Analyzed the impact of confident region thresholds on AffinityNet performance, showing that threshold selection directly influences pseudo-label quality and overall WSSS pipeline effectiveness.
- Devised novel evaluation criteria to optimize confident foreground and background thresholds, improving the quality of pseudo labels and addressing an important gap in existing research papers.

ROMER Research Center — Ankara, Turkey

Research Intern — *July 2022 – Sep 2022, Internship*

- Worked on a project that aims to reposition a robot arm concerning the position, orientation, and alignment of a captured image of an object, ensuring it appears as though the arm never moved.
- Researched, implemented, and compared several feature-based image-matching algorithms, including SIFT, SURF, FAST, ORB, and the SuperGlue model, for accurate image alignment.
- Applied RANSAC and NN ratio matching algorithms to eliminate weak matches, enhancing the robustness of the image-matching process.

Work Experience

Kuartis — Ankara, Turkey

Computer Vision/Machine Learning Intern — *July 2023 – Sep 2023, Internship*

- Conducted a literature review on Weather Classification for Autonomous Driving. Collected data for various weather conditions, applied the CLAHE filter to images, and divided them into patches. Adopted model architectures for multi-frame input, trained, and tested several image classification models.
- Performed a literature review on Semantic Occupancy Prediction. Presented a report summarizing state-of-the-art architectures, loss functions, and datasets.
- Implemented a horizon detection pipeline for Marines using classical vision methods. Utilized the Canny edge detector to extract edges at different scales, fused the extracted edge maps, fitted horizon lines on the fused maps using the Hough Line Transform, and eliminated outliers with RANSAC.
- Evaluated several trackers in the OpenCV library and determined that the CSRT Tracker is the most accurate while achieving real-time performance.
- Delivered a presentation on dataset curation, neural architecture search (NAS), and hyperparameter optimization.

Projects

ICCV 2023 Paper Implementation: DiffDis – Deep Generative Models Course

- Implemented "DiffDis: Empowering Generative Diffusion Model with Cross-Modal Discrimination Capability" (ICCV 2023) as the project of the Deep Generative Models course. Developed a working version of the paper, addressing the lack of open-source implementation.

Awards & Achievements

METU Graduation Project Competition (**3rd Place**, Jun 2024)

- RoboDetection, a robot dog simulation project, aids rescue teams in disaster zones. Controlled via a remote web interface, it can detect and track people while generating a real-time 2D map of the environment.

TEKNOFEST Artificial Intelligence in Transportation Competition (**2nd Place**, Sep 2021)

- A state-of-art object detection model, YOLOR-D6 detecting vehicles (automobiles, trucks, motorbikes, buses, . . .), pedestrians, Flying Car Parking (FCP) areas, and Flying Ambulance Landing (FAL) areas from UAV footages.