Ege Yüceel

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EDUCATION

University of Illinois Urbana-Champaign   Illinois, United States
Ph.D. in Electrical and Computer Engineering; Advisor: Prof. Sayan Mitra   *Aug 2024 – Present*
Promise of Excellence Fellowship

Bilkent University   Ankara, Turkey
B.Sc. in Electrical and Electronics Engineering; GPA: 3.88/4.00 - High Honors Student   *Sep 2020 – Jun 2024*

SKILLS

Languages: C/C++, Python, MATLAB, R

Technologies: ROS, Gazebo, Docker, Apptainer, Google Firebase, Git, OpenCV, PyTorch, TensorFlow

Fluent in: English, German, Turkish

EXPERIENCE

Otto von Guericke University   Magdeburg, Germany
Visiting Researcher   *July 2023 – September 2023, Full-time*
- Developed algorithms for swarm robot optimization and collective path planning problems.
- Created simulations and performed experiments for data collection.

Aselsan Research Center   Ankara, Turkey
Research Intern   *June 2023 – July 2023, Full-time*
- Programmed an autonomous locomotion software for the Vision60 quadruped robot using ROS interface and processed sensory information for the perception of the quadruped robot.
- Developed a variational autoencoder pipeline to compress high dimensional perception data to ease motion planning.
- Developed a "Forward Model" that predicts the mobile robot's future observations by using the current sensory information and control input for task and motion planning applications.

Geodo Technology   Ankara, Turkey
Candidate Engineer   *Dec 2020 – June 2023, Part-time*
- Designed two-layer circuit boards for the power distribution of a multifunctional GNSS-RTK module.
- Led the artificial intelligence branch for an automation product that will be used to construct maps of underground infrastructure that consist of various objects from water pipelines to internet cables.
- Developed tilt compensation algorithms for the error correction of a cm-level GNSS-RTK positioning measurements. Performed embedding programming to retrieve RTCM error correction data from TUSAGA servers.

AB Mikronano   Ankara, Turkey
Intern   *June 2022 – July 2022, Full-time*
- Performed Harmonic Load Pull Measurements to assess the performance of a GaN-based transistor and to determine the required input-output impedances for matching.
- Designed an integrated circuit with ADS for an Inverse Class F Amplifier, operating at 3.1Ghz.

AWARDS & ACHIEVEMENTS

Research Excellence Award: Awarded to senior students who demonstrate outstanding dedication and success in research studies by Bilkent University. (June 2024)

Promise of Excellence Fellowship: Awarded to incoming students who demonstrate the potential to achieve great things in the field of Electrical and Computer Engineering by University of Illinois Urbana-Champaign. (Feb 2024)

TUBITAK BIDEB 2209-B University Students Research Projects Grant : Awarded to support the graduation project focused on the development and implementation of wireless train signalization systems. (Jan 2024)

Comprehensive/Full Scholarship of Bilkent University (Sep 2020)

Full Scholarship of Tarsus American College (Sep 2015)

PUBLICATIONS

Yuksel Arslantas, **Ege Yuceel**, Yigit Yalin, Muhammed O. Sayin, **Convergence of Heterogeneous Learning Dynamics in Zero-sum Stochastic Games** *Google Scholar*

Yuksel Arslantas, **Ege Yuceel**, Muhammed O. Sayin, **Strategizing against Q-learners: A Control-theoretical Approach** *Google Scholar*

PROJECTS

Autonomous Structure Building with Graph Neural Networks | *GitHub*

- This project introduces a novel approach using graph networks for task and motion planning in robotic structure building. The system transforms an initial object configuration to a desired one by inferring spatial relations and representing them as a graph. A graph neural network (GNN) identifies movable objects and determines the necessary action sequence. Integrated with a Graph Search-based algorithm within the RAI framework, the system effectively classifies movable objects and operates a robot arm with a motion planner and solves challenges like tower and wall building fast.

Predictive Modeling for Robotic Perception | *GitHub*

- In the project, high-dimensional perception data was compressed using a variational autoencoder (VAE) pipeline, optimizing the efficiency of motion planning. The project's "Forward Model," designed for task and motion planning applications, was constructed to predict the mobile robot's future observations based on current sensory inputs and control actions. This predictive capability was achieved by integrating the VAE with a Long Short-Term Memory (LSTM) network.

Wireless Train Signalization | *GitHub*

- This project was developed for the Industrial Design Project course in Bilkent in collaboration with Savronik A.Ş.. Its primary objective is to devise a cost-effective approach to railroad signaling in Turkey that can be impleted to both signalled and non-signalled railways without large infrastructure changes. The design features an onboard device installed on the train, an on-track balise, an online database, and a graphical user interface (GUI).

IdentiFusion: A Multimodal Approach to Facial Attribute Recognition | *GitHub*

- This project introduces a multimodal system that combines Natural Language Processing (NLP) and Computer Vision to match textual face descriptions with corresponding facial images. The core component, FaceBERT, is a fine-tuned NLP model designed to extract facial features from text, trained on the synthetic FaceSynth-3k dataset. For Computer Vision, the LightenedMOON model, trained on the CelebA dataset, recognizes facial attributes from images. The system integrates a comparator to align textual descriptions with facial images, effectively merging outputs from both models.

Linear Variable Differential Transformer (LVDT) Sensor

- This project was prepared as the final project of the Engineering Electromagnetics (EE351) course. The purpose of this sensor is to measure displacement with high accuracy by using the difference of induced currents on the coils of the sensor.