

Ege Yuceel

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RESEARCH STATEMENT

My research interests broadly lie in robotics, particularly in exploring the safe and robust limits of vision-based control. I am also interested in world models and neural scene representations to enable autonomous planning in complex, dynamic environments.

EDUCATION

University of Illinois Urbana-Champaign

Illinois, United States

Aug 2024 – Present

Ph.D. in Electrical and Computer Engineering; Advisor: Prof. Sayan Mitra;

M.S. in Electrical and Computer Engineering; GPA 4.0

Aug 2024 – June 2026 (Expected)

Promise of Excellence Fellowship

Bilkent University

Ankara, Turkey

Sep 2020 – June 2024

B.Sc. in Electrical and Electronics Engineering; GPA 3.88 (High Honors)

Research Excellence Award, Full Scholarship

- **Related Coursework:** Learning for Robotics, Computer Vision, Diffusion and Flow Matching, Feedback and Control Systems, Robust Feedback Control, Optimal Control, Computational Inference, Random Processes

PUBLICATIONS/PREPRINTS

[Under Review] Yan Miao, **Ege Yuceel**, Georgios Fainekos, Bardh Hoxha, Hideki Okamoto, Sayan Mitra, *Performance-Guided Refinement for Visual Aerial Navigation using Editable Gaussian Splatting in FalconGym 2.0*. Submitted to ICRA. [arXiv](#).

[Published] Yuksel Arslantas, **Ege Yuceel**, Yigit Yalin, Muhammed O. Sayin, *Convergence of Heterogeneous Learning Dynamics in Zero-sum Stochastic Games*. IEEE Transactions on Automatic Control, 2025. [IEEE Xplore](#).

[Published] Yuksel Arslantas, **Ege Yuceel**, Muhammed O. Sayin, *Strategizing against Q-learners: A Control-theoretical Approach*. IEEE Control Systems Letters, 2024. [IEEE Xplore](#).

EXPERIENCE

Reliable Autonomy Group

Illinois, United States

Aug 2024 – Present

Graduate Research Assistant, Advisor: Prof. Sayan Mitra

- Research on safe-autonomy, reach-avoid planning, vision-based control, quadcopter motion planning.

SwarmLab

Magdeburg, Germany

July 2023 – Sep 2023, Full-time

Intern, Advisor: Prof. Sanaz Mostaghim

- Assisted a Ph.D. student in developing the Decentralized Collective Conflict Resolution algorithm for safe swarm motion planning with debugging code, contributing to the coding of the local planner and performing experiments. Experience with ROS and Gazebo.

Aselsan Research Center

Ankara, Turkey

June 2023 – July 2023, Full-time

Intern

- Development of a motion planner for Vision60 quadruped robot, latent space extrapolation using LSTM and variational auto-encoders for future observation forecasting. Experience with ROS, OpenCV, PyTorch, Docker.

Bilkent University

Ankara, Turkey

Jan 2022 – June 2024

Undergraduate Researcher, Advisor: Asst. Prof. Muhammed O. Sayin

- Research on theoretical convergence analysis of RL algorithms. [\[IEEE TAC\]](#)
- Research on the strategizing against Q-learning algorithms. [\[L-CSS\]](#)

Undergraduate Researcher, Advisor: Asst. Prof. Ozgur S. Oguz

Sep 2023 - June 2024

- Development of a combined task and motion planner for autonomous structure building using Graph Attention Networks and k-order Markov Path Optimization.

Geodo Technology

Ankara, Turkey

Jan 2021 – Sep 2023

R&D Engineer

- Developed AI and software systems including GNSS-RTK data processing, embedded programming for GSM communication, IMU tilt-compensation algorithms, and computer vision pipelines using YOLO for GPR data classification; designed GAN-based synthetic data augmentation models to improve training robustness.

SERVICE

- Reviewer, *International Conference on Neuro-symbolic Systems (NeuS)*, 2025

PROGRAMMING AND HARDWARE SKILLS

- **Robotics Frameworks:** ROS1 & ROS2, MAVSDK, MAVLink, Gazebo, MuJoCo
- **Hardware Experience:** Drone platforms (PX4, Betaflight), Quadruped robot, TurtleBots, Motion capture systems
- **Programming:** Python, C++, MATLAB
- **Technical Areas:** Reinforcement learning, computer vision, control theory, optimization

SELECTED PROJECTS

Joint Vision-Based Controller and Lyapunov Function Training

Developed an end-to-end vision-based control framework for drone navigation through rings, jointly training a neural controller and a neural Lyapunov function to ensure safety and stability. Implemented differentiable rendering, imitation learning (DAgger), and Lyapunov-based verification.

Safe Navigation with Gaussian Splatting

Designed an uncertainty-aware navigation pipeline for aerial robots using editable Gaussian splatting for 3D mapping, RRT-based planning, and PID control. Achieved stable vision based control under sensor noise via real-time replanning and pose estimation.