

Tuna Gürbüz

Graduate Electrical & Computer Engineer

+49 17632279590 | [Email](#) | [Github](#) | [LinkedIn](#)



RESEARCH INTERESTS:

Multiview and multimodal scene understanding and spatial reasoning, with a focus on perception-driven planning and control for autonomous and collaborative robots in partially known environments.

EDUCATION:

October 2022 – November 2025

M.Sc. Electrical & Computer Engineering – Technical University of Munich (TUM), Germany

- Specialization in the fields of: Advanced Non-Linear Control, Data-Driven Decision Making, Estimation Theory, Signal & Image Processing.
- Master Thesis: [Multiview Panoptic Operating Room Segmentation](#) (Grade: 1.0).
- Final Grade: 1.5.

September 2019 – October 2022

B.Sc. Electrical & Computer Engineering – Technical University of Munich (TUM), Germany

- Fundamentals in: Circuits and Systems, Control Systems, Computer Systems, Signal Theory, Stochastics, Analog and Digital Circuits, Linear Algebra.
- Bachelor Thesis: [Shared Control Based on Both Tracking Performance and Human Torque for Robotic Rehabilitation](#) (MATLAB/Simulink, Grade: 1.7).
- Final Grade: 2.1.

September 2014 – June 2019

German High School Istanbul (Deutsche Schule Istanbul), Turkey

- Final Grade: 1.9.

RESEARCH EXPERIENCE:

February 2025 – November 2025

Master Thesis: Multiview Panoptic Operating Room Segmentation

Informatics 16, Technical University of Munich – Munich, Germany

- Investigated 3D feature lifting using [NeRFs and voxel networks](#) for panoptic segmentation.
- Explored vision foundation models, e.g. [SAM](#), [DINO](#), [CLIP](#), for multimodal understanding.
- Adapted the [VGGT](#)'s aggregator for spatial understanding and achieved **+5% Panoptic Quality (PQ)** improvement with the video model and **+7% PQ** improvement with the multi-view model on the MM-OR and 4D-OR datasets.

July 2024 – January 2025

Intern/Work Student Deep Learning for Communications

February 2024 – October 2025

Huawei Research Center – Munich, Germany

- Built an [autoencoder FFN](#) (PyTorch) with a model-based decoder for signal covariance estimation, outperforming baseline by around **+7 dB SNR**.
- Built an automatized synthetic data generation, model training and evaluation pipeline.
- Trained a [transformer model with unique learnable position embeddings](#) for beamspace phase error estimation which achieves a similar performance as the baseline PNP algorithm in a significantly lower time.

March 2024 – May 2025

Research Intern: Semantic Mapping with Quest 3 AR/VR

Chair of Cognitive Systems, Technical University of Munich – Munich, Germany

- Developed Unity (C#) app for 6-DoF tracking and scene mesh extraction on Quest 3.
- Integrated ROS# for real-time wireless transfer to master computer for ray tracing from the headset pose in the scene mesh with smaller than 10 ms latency.
- Deployed Mask2Former (Detectron2) on the master computer for real-time panoptic segmentation, which achieves for mesh labeling at 15 Hz throughput using NVIDIA RTX3090.

April 2022 – September 2022

Bachelor Thesis: Shared Control for Robotic Rehabilitation

Chair of Information-oriented Control, Technical University of Munich – Munich, Germany

- Simulated a 2-DoF (MATLAB) robot arm's dynamics and designed PD + gravity compensation-based impedance controllers for position tracking.
- Implemented an assist-as-needed strategy adapting controller gains online based on human performance.

INDUSTRY EXPERIENCE:

July 2023 – March 2024

Work Student: C/C++ Developer - AED Vantage – Munich, Germany

- Developed C++ modules for the IPBasis ECU of the new BMW vehicle generation.

September 2021 – September 2022

Part-Time Electronics Engineer - TUfast Student Racing Team – Munich, Germany

- Designed schematics and layout for centralized A/D boards, and microcontroller programming in C++. won the **3rd place in FSG 2022**.

SELECTED PROJECT:

March 2024 – August 2024

Autonomous Drone Racing Project

Chair of Learning Systems & Robotics, Technical University of Munich – Munich, Germany

- Trained a reinforcement learning-based path planning model for autonomous drone racing (Stable-Baselines3) and evaluated robustness under varying noise levels and modeling errors in simulation (PyBullet).
- Reached **60% success rate** under combined noise and modeling errors (uniform noise ± 10 cm).
- Transferred the policy from simulation to real-world flight.

SKILLS:

Programming Languages

Python, C++, MATLAB/Simulink

Frameworks

PyTorch, PyBullet, Gazebo, Gymnasium, Stable-Baseline3, Hugging Face Transformers, OpenCV, OpenGL, Eagle (Autodesk)

Tools and Technologies

Git, SLURM, CMake, ROS

Languages

Turkish (Native), English (C1), German (C1)

FREE TIME ACTIVITIES:

Hiking in the Alps, playing football and video games (Paradox Studios). Programming Arduino and ESP-32 boards for various applications and sensors.

PUBLICATIONS:

We **submitted** a paper for **MICCAI 2026** as an extension of my master's thesis.

We **submitted** a paper for **SAM 2026** as an extension of my internship at Huawei.



Munich, 9 March 2026