

Mehmet Ömer Tepe

Electrical & Electronics Engineer | Machine Learning | Embedded Systems | Circuit Design

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Summary

Electrical & Electronics Engineering undergraduate, expected to graduate in 2027. Hands-on project experience spans analog power-electronics design, embedded C firmware on AVR microcontrollers, and applied machine learning in Python. Carries hardware projects end-to-end, from LTspice simulation through soldered prototype and 3D-printed enclosure.

Education

Istanbul Bilgi University

B.Sc. in Electrical & Electronics Engineering

Istanbul, Turkey

2022 – 2027 (expected)

Eyüboğlu College

High School Diploma

Istanbul, Turkey

2018 – 2022

- Member of the FIRST Robotics Competition (FRC) team.

Projects

University Projects

LED Flashlight Boost Converter Feedback Control

2025

- Co-designed a 32 V boost converter; hand-calculated inductor, MOSFET, and capacitor values and validated the topology in LTspice.
- Implemented PI closed-loop firmware on an ATtiny85 to regulate output under varying input conditions.
- Prototyped on breadboard, sourced cost-optimized components from multiple distributors, and 3D-printed a custom enclosure housing the LED, heatsink, electronics, and battery.

Diabetes Prediction Model

2024

- Built a diabetes-prediction classifier in a 4-person team, reaching 82% accuracy with 5-fold cross-validation.
- Engineered features via Spearman correlation and Random Forest importance; benchmarked Logistic Regression, Random Forest, and LightGBM models, comparing them with ROC curves and confusion-matrix analyses.

Arduino-Based Controller Proof-of-Concept

2022

- Developed an Arduino-based game controller emulating an Xbox interface in C firmware, sustaining a stable 100 Hz polling rate.
- Streamed input data over UART to a Python host script and 3D-printed a custom enclosure for the hardware.

Personal Projects

Multi-Layer Quantitative Trading System (in progress)

Expected Early 2027

- Designing a multi-layered unsupervised trading system that combines classical quantitative-finance methods, traditional ML models, and high-frequency trading techniques.
- Using fine-tuned ML models for cross-layer orchestration and dedicated sub-agents for macroeconomic analysis.

Real-Time Multi-Camera Full-Body VR Tracking

2026

- Built a low-cost multi-camera full-body tracking system for SteamVR that achieves sub-16 ms end-to-end latency via Tensor Core-accelerated inference on an RTX 3080, improving VR embodiment while avoiding the cost of commercial trackers and the dead-zone failures of single-camera setups.
- Implemented OpenCV-based camera calibration to recover and persist each camera's extrinsic pose, reducing setup to a one-time step for a fixed camera arrangement.
- Reconstructed 3D positions for 17 tracked joints by triangulating pose estimates across 2 cameras and fusing them with confidence-weighted estimates, improving robustness against occlusion, back-facing poses, and dead zones.
- Integrated the tracking output with SlimeVR/SteamVR for plug-in compatibility with existing VR games and applications.

Skills

Programming Languages: Python, Java, C/C++, MATLAB, SQL

Hardware & EDA: KiCad, PCB Design, LTspice, Simulink, AutoCAD, Embedded System Programming

Data & Machine Learning: Machine Learning, Computer Vision, Pose Estimation, OpenCV, Multi-View Geometry / 3D Triangulation, GPU & Tensor Core Inference, Feature Engineering, scikit-learn, LightGBM, Data Engineering

Tools & Platforms: Linux, Bash, LaTeX

Languages

Turkish: Native

English: Proficient (IELTS 8.0)