Goktug Can Simay

MECHATRONICS, ROBOTICS AND AUTOMATION ENGINEER · UNIVERSITY OF ESSEX, UK

+44 077 605 853 37 | simaygoktug@gmail.com | www.goktugcansimay.com | www.github.com/simaygoktug | www.linkedin.com/in/goktugcan

About Me

Programming - Development: Python · C · MATLAB · LabVIEW · Quartus/ModelSim · PLC Ladder/ST Logic

Robotics – Control Systems: ROS2 · Gazebo · LIDAR - QoS Profile · Navigation · Mapping · SLAM · URDF Model Creation · Control Theory (PID Tuning, Feedforward + Filtering) · Servo/Asynchronous Motor Control · Drivers

Computer Vision - Perception: OpenCV · DL CV Models · Sensor Fusion · Kalman Filtering

Machine Learning – Data Science: Neural Networks (MLP, LSTM-based Crypto Forecasting Architecture) · Preprocessing · Normalization · Feature Extraction · NumPy · Pandas · TensorFlow · Performance Optimization

Projects

Hybrid Fuzzy-PID Navigation System for Real Mobile Robot   *2025*

https://github.com/simaygoktug/robotics_and_control

- I designed a hybrid Fuzzy Logic + PID controller for autonomous navigation using ROS 2 and a 2D LIDAR. The system performs obstacle avoidance, right-edge following, and adaptive corner turning with dynamic direction-locking to eliminate oscillations. Fuzzy membership functions, linguistic rules, and centroid defuzzification were implemented from scratch. PID control was integrated for precision wall-following.
- **ROS2 · Gazebo · PID · Fuzzy Logic · Inertial Measurement Unit · LIDAR · Localization · Mapping**

Neural Network From Scratch – Multilayer Perceptron for Regression   *2025*

https://github.com/simaygoktug/deep_neural_networks

- I built a complete MLP neural network from scratch without using TensorFlow or PyTorch. All components, forward propagation, backpropagation, gradient descent, momentum, and RMSE evaluation, were coded manually. The model predicts projectile motion parameters using a fully normalized dataset and a custom preprocessing pipeline. Coded full forward and backward passes, including δ-calculations, weight updates, and momentum terms.
- **Python · Data Preprocessing · Data Analysis · Backpropagation · Numerical Computation · Machine Learning**

Internships

Turkish Aerospace Industries Inc. (TAI)   *Ankara, Turkey*

SYSTEM ENGINEER INTERN   *Aug. 2024 - Sep. 2024*
- I gained practical experience in test engineering, PID tuning, LabVIEW programming, calibration, and position/velocity control. This role deepened my understanding of force and torque control in high-precision aerospace applications.
- **FPGAs · Real Time Control · Shihlin Servo Control · Laser Sensors · NI cDAQ · LabVIEW · Force/Torque Control · PID Tuning**

Mercedes-Benz Türk A.Ş. (Daimler Truck AG)   *Istanbul, Turkey*

RESEARCH AND DEVELOPMENT INTERN   *Aug. 2023 - Sep. 2023*
- I contributed to a project that applied TensorFlow and OpenCV to enhance the efficiency of dial error detection on Mercedes-Benz Tourismo buses, providing actionable data for maintenance and repair. This experience helped me solidify my technical proficiency while underscoring the value of AI in predictive maintenance and quality control in industrial settings.
- **Artificial Intelligence · Computer Vision · Multiple Object Tracking · Tensorflow · YOLO · OpenCV**

Metadiag Automotive Technologies   *Istanbul, Turkey*

AUTOMATION ENGINEER INTERN   *Aug. 2022 - Sep. 2022*
- I developed a real-time embedded system on the STM32F412G Discovery board using C, HAL libraries, FSM design, and FreeRTOS. The system integrates multiple sensors (ALS LTR-308, MC3479 accelerometer), an LCD-based UI, UART debugging, and LED/button hardware through shift registers. A multi-tasking architecture was implemented with precise timing, enabling sensor acquisition, graphics rendering, and human-machine interaction without blocking delays. Implemented 3 independent FreeRTOS tasks for ALS data acquisition, accelerometer reading, and LCD output rendering.
- **C Programming · STM32 HAL · FSM Design · I2C · UART · Embedded Optimization**

Education

University of Essex   *Colchester, UK*

Master of Science - MSc, Intelligent Systems and Robotics   *Oct. 2025 - October 2026*

Yildiz Technical University   *Istanbul, TR*

Bachelor of Science - BSc, Mechatronics, Robotics, and Automation Engineering   *Aug. 2020 - January 2025*
- **GPA: 3.09/4.00 – Honor's Student**
- **YTU Machine Technologies Club – AI, CV Team Member**

German Culture and Education Foundation Gymnasium   *Istanbul, TR*

High School Diploma - Mathematics and Science   *Sep. 2015 - January 2020*
- **Grade: 94.6/100 – First Place**
- **DSD II C1 German Sprachdiplom, Global Issues Network - Luxembourg and Copenhagen – 2017, 2018**