Doruk Tan Atila

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Summary: Driven Electronic Engineer with expertise in **embedded systems** and **hardware design**. Passionate about developing innovative solutions across diverse applications, with professional experience in **aerospace electronics**.

Work Experience

Embedded Systems Engineer Nov 2023 - PRESENT
Nevspace Space Technologies
Leading the complete electronics design process for aerospace applications, including high-reliability PCB design and firmware development. Developed and optimized communication protocols (UART, SPI, I2C) for real-time data acquisition in critical environments. Delivered modular designs that reduced production time while ensuring aerospace-grade system reliability.

Skills Used: *Embedded Systems, PCB Design, Firmware Development, Aerospace Electronics*

Data Analyst / Business Developer May 2022 - June 2023
Arcanor - Istanbul, Turkey
Optimized SQL queries and developed an algorithm for querying cross-country mobility data, enhancing data accessibility and performance. Coordinated product development, documentation, and website management as part of a dynamic startup team. Streamlined team workflows by integrating Google services and improving operational efficiency.

Skills Used: *Data Analysis, Project Management, SQL, Product Development, Startup Operations*

Software Engineering Intern June 2019 - July 2019
Softtech Software Technologies R&D - Istanbul, Turkey
Designed and implemented Python scripts for automated and manual drone control, achieving significant operational accuracy. Trained a pattern recognition algorithm in Python to identify medical conditions, collaborating with the software development team. Gained hands-on experience in embedded systems and simulation tools within a Linux (Ubuntu) environment.

Skills Used: *Python, Machine Learning, Embedded Systems, Linux (Ubuntu), Simulation*

Education

Bachelor of Engineering Electronic Engineering — *The University of Manchester* Sept 2021 - December 2024
GPA: 1st Class Honours
Relevant Units: *Digital Design, Computer Architecture, VLSI Design, Microcontroller Engineering 1&2, Embedded Systems*

High School Diploma — *The American Robert College of Istanbul, Turkey* Sept 2016 - June 2021
GPA: 88.03/100
Relevant Units: *Electronics, AP Physics C, AP Calculus BC*

Publications

Organic Phototransistors as Artificial Synapses for Neuromorphic Systems 2024
Published in *Sensors and Actuators A: Physical*

Conducted research on novel organic phototransistors with applications in neuromorphic computing, focusing on their use as artificial synapses.

A Novel Approach to Modelling of MOS Devices for Simulation 2024
Published in *GitHub*

Designed a simulation tool to analyze MOSFET behavior, integrating quantum-mechanical semiconductor physics for advanced modeling.

Projects

For a more complete list of projects, check LinkedIn.

IoT & Wireless Communication with ESP32 Jan 2025 - Feb 2025
Developed an ESP32-based IoT system enabling Wi-Fi provisioning, cloud integration, and real-time data transmission. Implemented sensor data acquisition and transmission to AWS via HTTP requests, using API Gateway, Lambda, and S3 for live visualization. Extended the Rocket Controller Card Development by wirelessly transmitting UART output from the rocket card to a laptop/mobile device over TCP/UDP Wi-Fi, enabling seamless debugging and telemetry.

Skills Used: *ESP32, Wi-Fi, TCP, UDP, HTTP, AWS API Gateway, Lambda, S3, Embedded Systems, UART, IoT*

Commercial Rocket Controller Card Development Oct 2024 - Jan 2025

Designed and developed a high-reliability controller card for rocket recovery, integrating STM32F103RB, BNO055, BMP390, and an SD card module. Implemented sensor drivers, communication protocols, and altitude-based parachute deployment logic. Contributed to high-speed PCB design, ensuring signal integrity and thermal management in aerospace environments. Developed a user-friendly GUI for parameter adjustments and system monitoring.

Skills Used: *Embedded Systems, STM32, I2C, SPI, UART, PCB Design*

Wireless Video and Audio Broadcasting System on Ultra96-V2 FPGA Oct 2024 - PAUSED

Developed Verilog modules for real-time video/audio transmission and compression on Ultra96-V2 FPGA. Focused on low-latency, high-fidelity multimedia delivery.

Skills Used: *FPGA, Verilog, Xilinx, Multimedia Compression*

PCB Adapter for Nucleo64-to-Breadboard Connection Nov 2024 - Nov 2024

Designed a DRC-compliant PCB adapter to interface Nucleo64 boards with standard breadboards, using Altium Designer.

Skills Used: *PCB Design, Altium Designer*

Automatic Plant Monitoring & Watering System Oct 2024 - Oct 2024

Developed a low-power STM32F401RE-based system to monitor soil moisture and activate water pumps. Utilized RTC for periodic wake-ups, achieving 99.99% power reduction compared to continuous operation.

Skills Used: *Power Optimization, Microcontrollers, STM32, C, Embedded Systems, RTC Programming*

MOSFET Modelling and Simulation Sept 2023 - May 2024

Derived a MOSFET model from quantum-mechanical semiconductor physics foundations and built a standalone C++ program capable of simulating the output and transfer curves of a MOSFET with manufacturing parameters.

Skills Used: *C++, Qt, MOSFET, Solid State Physics, Modeling, Simulation, Semiconductor Device, OFET*

Cache Simulator Apr 2024 - Apr 2024

Developed a cache simulator in C to evaluate and compare cache configurations using real memory trace files. Provided insights into cache performance metrics such as hit/miss rates and access latency, assisting in optimizing memory hierarchies.

Skills Used: *C, Cache, Simulation, Memory Systems*

Concurrent Systems Nov 2023 - Nov 2023

Coded a simulation of a four-by-one hundred-meter sprint relay race. The project involved creating threads, synchronizing them, and ensuring thread safety.

Skills Used: *C++, Multithreading, Simulation*

Line Following Buggy Sep 2022 - Apr 2023

Developed two line-following buggies using distinct technologies. Programmed an STM32F401RE microcontroller to process data from six light sensors and implement PID control for precise motor adjustments. In a separate project, programmed a Nvidia Jetson Nano to capture video, process line contours with image recognition, and utilize PD motor control for alignment. Demonstrated expertise in embedded systems, algorithm design, and image processing.

Skills Used: *Embedded Systems, STM32, C++, PID Control, Python, ROS, Image Processing*

VHDL Stopwatch Nov 2022 - Nov 2022

Developed a stopwatch on FPGA using VHDL and finite state machines for timing control.

Skills Used: *FPGA, VHDL, Finite State Machine*

Building a Cargo Carrying Drone Jan 2018 - Jan 2019

Built a quadcopter for a competition, coding two Arduino boards for wireless control of an electromagnet to carry/drop cargo. Team placed 1st in Turkey.

Skills Used: *Drones, Arduino, Microcontrollers, Embedded Systems, Python, Cabling, Problem Solving*

Skills

- **Programming Languages**: Verilog, VHDL, Assembly, C, C++, Python, CUDA, MATLAB with Simulink, Mbed
- **Software Tools**: STM32CubeIDE, Keil uVision, Altium Designer, Xilinx Vivado, Tanner EDA Tools
- **Communication Protocols**: I2C, SPI, UART, Bluetooth, WiFi, TCP/IP, UDP, HTTP
- **Technical Skills**: High-speed PCB design, Analog PCB design, Embedded Systems Development, Sensor Integration, Firmware Optimization, Circuit Debugging

Certifications

- Accelerating CUDA C++ Applications with Concurrent Streams Feb 2023
- Fundamentals of Accelerated Computing with CUDA C/C++ Jan 2023