Doruk Tan Atila

doruktanatila4@gmail.com | 773-313-1169 | doruktanatila | ProfDorukTan | Manchester, UK

Summary: Electronic engineering graduate with 1st Class Honours, various projects and research experiences. Passionate about **FPGA** and **embedded systems** with a niche interest in **neuromorphic computing**.

Education

Bachelor of Engineering — *The University of Manchester, Manchester, UK* 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

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

Skills Used: *Developed a simulation tool for analyzing MOSFET behavior, incorporating quantum-mechanical semiconductor physics.*

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

Skills Used: *Researched novel organic phototransistors with potential for neuromorphic computing applications.*

Projects

Wireless Video and Audio Broadcasting System on Ultra96-V2 FPGA Oct 2024 - PRESENT
Designed and developed a hardware solution for wireless video and audio transmission using the Ultra96-V2 FPGA board. The design emphasizes high-performance compression algorithms and real-time data transmission for multimedia applications.

Skills Used: *FPGA, Verilog, Xilinx, Xilinx UltraScale+, Audio/Video Compression*

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*

BNO055 Sensor Implementation Using STM HAL Oct 2024 - Oct 2024
Developed drivers for the Bosch BNO055 IMU sensor and integrated it with STM32F401RE using STM HAL. The sensor provides data for a secondary rocket controller, with an optimized I2C protocol for low-latency communication.

Skills Used: *I2C, RTL Coding, Embedded Systems, IMU, STM HAL*

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*

Organic Phototransistor Array for Infrared Imaging May 2024 - May 2024
Designed an organic phototransistor array for infrared imaging using a conjugated polymer from literature, incorporating filter arrays to detect NIR, SWIR, MWIR, and broadband wavelengths for precise detection of specific infrared bands.

Skills Used: *Sensor Design, Signal Conditioning, Imaging Sensors*

Cache Simulator Apr 2024 - Apr 2024
Developed a cache simulator in C to evaluate and compare different cache configurations using real memory trace files. The simulator provides insights into cache performance metrics such as hit/miss rates and access latency, assisting in optimizing memory hierarchy designs.

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*

Microcontroller-Peripheral Communication I2C/SPI Nov 2023 - Nov 2023

Programmed STM32F401RE microcontroller using low-layer C libraries to enable data transfer between the controller and peripherals.

Skills Used: *Embedded Systems, C, SPI, I2C, Keil uVision*

Line Following Buggy (STM32F401RE) Sep 2022 - June 2023

Programmed STM32F401RE microcontroller to create a line-following buggy. The system gathered data from six light sensors, determined the line's position, and adjusted the motor speed to center the line using PID control.

Skills Used: *Embedded Systems, C++, STM32, Algorithms*

VLSI Design May 2023 - May 2023

Designed a 250nm technology CMOS schematic and layout of a circuit. Optimized the circuit for given speed/power requirements and passed DRC and LVS checks. The circuit implemented a logic boolean expression with 3 inputs.

Skills Used: *Tanner EDA, Calibre, CMOS, Very-Large-Scale Integration (VLSI)*

Line Following Buggy (Nvidia Jetson Nano) Apr 2023 - Apr 2023

Programmed Nvidia Jetson Nano for a line-following buggy. The algorithm captured front-facing video, processed the image to detect line contours, and utilized PD motor control to align the line as closely as possible to the middle of the buggy.

Skills Used: *Python, Robot Operating System (ROS), Embedded Systems, 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*

Work Experience

Data Analyst/Business Developer May 2022 - June 2023

Arcanor - Istanbul, Turkey

Optimized SQL queries and developed an algorithm to query cross-country mobility data. Coordinated various tasks as part of a startup team, working extensively in product development, documentation, website management, Google services, and translation.

Skills Used: *Data Analysis, Project Management, SQL, Startup Management, Google Services*

Intern June 2019 - July 2019

Softtech Software Technologies R&D - Istanbul, Turkey

Wrote and implemented Python code for automated and manual drone controlling. Trained a pattern recognition algorithm in Python to identify a medical disease, working with software development team members.

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

Skills

- **Programming Languages**: Verilog, VHDL, Assembly, C, C++, Python, CUDA, MATLAB with Simulink, Mbed, SQL
- **Software Tools**: Xilinx, STM32CubeIDE, NI LabVIEW, Tanner EDA Tools, Calibre Verification, Altium Designer, Keil uVision
- **Technical Skills**: High speed & analog PCB design, PVD, Spin-coating, Photolithography, Electrical Characterizations

Certifications

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