Doğukan Doğrubudak

Electrical & Electronics Engineer

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Education

2019-2024

- **Hacettepe University**
- B.Sc. in **Electrical and Electronics Engineering**

2018-2019

- Hacettepe University
- School of Foreign Languages
- English, B2

Skills

Digital Design-FPGA

- VHDL
- Nexys A7 100T, DE1-SoC
- Vivado, Quartus

Embedded Design

- C
- STM32 Nucleo
- Cube IDE

Analog Design

- Proteus, Altium Designer, LTspice

Programming Languages

- Python, C, Assembly

Soft Skills

- MS Office
- Problem identification, understanding and solving
- Analytical thinking

Languages

English: Intermediate (B2)

Summary

As a graduate of Electrical and Electronics Engineering, I have experience in VHDL, C, and Python, with strong skills in circuit design and FPGA development. Currently, I am improving myself in analog circuit design and embedded software alongside FPGA. I possess strong analytical thinking skills and a strong willingness to learn. I am seeking an Electronic Engineering position where I can utilize and further develop my skills.

Professional Experience

JUNE 2025

Freelance Hardware Engineer

- I am currently working as a volunteer at a small company engaged in freelance electronics projects.
- In the initial phase, I performed reverse engineering on a China-based **battery charger circuit** and created a detailed schematic.
- Currently, I am working with the STM32 Nucleo board to contribute to the development of a **jet engine control** board.

JULY 2023

ASTOR A.Ş. - Internship

- Completed internship both in the office and production site of a company specializing in SCADA and metal-clad switchgear systems.
- Gained hands-on experience in reading, analyzing, and interpreting panel-level electrical projects.
- **This experience enabled me to gain a broad perspective and hands-on understanding of system design and analysis — from the transistor/chip level to panel-level industrial applications.**

Self-Learning Experience

- Actively developing FPGA digital design skills by personally writing code for various algorithms, sensor interfaces, and communication protocols including **UART, SPI, I2C, and Ethernet.** Some of these implementations are showcased on my GitHub profile.
- Independently wrote all the code to successfully operate complex modules such as the **OV7670 camera**.
- Simultaneously improving analog design skills; independently designed a **joystick control circuit** featured in my project portfolio.
- My strong analytical abilities enable me to rapidly learn and adapt to different fields.

Certifications

- Dijital Donanım Tasarımcısı Olma Kursu, April 2025, Udemy

Projects

Project details are provided on the following page

- JANUARY 2025 -Joystick Controller
- JUNE 2024 - Term Project – Temperature Controller(FPGA)
- JUNE 2024 - Graduation Project – Emupent(Microprocessor Emulator)
- JANUARY 2024 - Term Project - ALU Design at Transistor (CMOS) Level

Projects Details

Joystick Control Circuit **February 2025**

- The joystick control board was partially reverse-engineered a joystick control board. Although not fully replicated, a circuit design was successfully created that supports up to 16 digital and 8 analog inputs and is directly recognized by the computer as joystick controls using the HID protocol.

Skills used: C, MikroC, Proteus, Circuit Design

Term Project - ML Based Temperature Controller (FPGA) **June 2024**

- An open-loop predictive control system and interface design were developed to adjust the ambient temperature based on temperature, humidity, and the number of people in the environment.
- Temperature and humidity data from the DHT11 sensor, along with the number of people, were transmitted to the computer interface via the UART protocol. Using this data, a target temperature value was calculated with the multiple linear regression method. The calculated temperature was then sent back to the FPGA board via UART, and the motor speed was controlled accordingly using a PWM signal.
- Additionally, the interface allowed manual control of various functions such as motor speed, ambient light level, and an alarm system.

Skills used: FPGA, VHDL, Quartus, Communication protocols (UART, Single-Wire), Python, Multiple Linear Regression, Interface Design

Graduation Project – Emupent **June 2024**

- An emulator simulating the x86-based Pentium microprocessor architecture was designed. This emulator includes 32-bit general-purpose registers, a flag control unit, interrupt management, and an instruction decoder module.
- A user-friendly system with a graphical interface was developed using Python. The system can parse and execute approximately 40 different Assembly instructions and perform input/output operations via the console.
- Additionally, the emulator's accuracy was verified through tests conducted on experiments performed in the lab by students taking the Microprocessor Design and Architecture course.

Skills used: Python, Interface Design, Assembly, Teamwork, Problem Solving

Term Project – 8x8 Multiplier **January 2024**

- This project involved a transistor-level CMOS layout design for an 8x8 multiplier.
- As a result, an 8x8 multiplier capable of multiplying two 8-bit binary numbers was integrated into an ALU.

Skills used: CMOS Layout Design, Electric (Circuit Design)