Rabia Göksel Demiray

Electronics and Communication Engineering Student

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About Me

I am an engineering student with a strong interest in digital system design, software programming, computer architecture, and continuously enhancing my experience in digital design, focusing on Verilog, FPGA, SoC, RISC-V, and C programming.

Education

Istanbul Technical University

Electronics and Communication Engineering Student (Undergraduate)
4th grade -- Expected graduate: 2025

42 Istanbul

C/C++ programming and Software Engineering Student
Expected graduate: 2025

Experience

Tübitak Bilgem TÜTEL **2024 August - Present**
Digital Design Engineer - Intern
- I am focusing on RISC-V architecture and learning about digital design with various projects.

ITU GSTL **2024 February - Present**
Digital Design and Cryptography - Researcher
- I focus on designing and implementing RISC-V processors and cryptographic algorithms with Verilog, Assembly and Python. My responsibilities include developing secure and efficient hardware solutions, researching advanced cryptographic techniques, and optimizing processor designs for performance and security.

Cezeri Artificial Intelligence and Robotics Technologies **2024 July - 2024 August**
Digital Design Engineer - Short Term Intern
- I developed a VHDL module for a GNSS receiver to recognize the PRN of satellites. This involved designing and testing the module to ensure accurate and efficient signal processing and data handling.

ITU Autobee Team **2022 November - 2023 July**
- I worked on embedded programming using STM32 microcontrollers. My tasks included designing and implementing firmware for various robotic components, integrating sensors, and ensuring reliable communication between system modules.

Projects

Tübitak 1001
- I am currently involved in a TÜBİTAK 1001 project focusing on RISC-V and developing cryptography algorithms like NTT and Kyber. A part of this project is going to be my graduation project. I am working with Prof. Dr. Sıdıka Berna Örs Yalçın and Prof. Dr. Erkan Savaş. Now, I am learning in the field where I want to advance my career.

ITU Yonga
- As a team from ITU GSTL, we are developing a processor to participate in Teknofest. My responsibility is to develop algorithms for our processor's cache memory. My architecture effectively uses the 2-way set associative structure, the write-back algorithm, and the LFU algorithm.

my_first_processor
- I created a small single cycle processor with respect to RISC-V I type instruction set using Verilog. I am now learning the RISC-V architecture and working on improving this processor based on RISC-V principles. I am currently trying to improve hazard unit and branch prediction unit of my processor.

42 Istanbul - Minitalk - so_long - push_swap - Philo - Minishell - cube3d
- I began coding in C at Ecole 42. Minitalk is a data exchange program using UNIX signals for client-server communication. So_long is a 2D game project, while push_swap focuses on sorting algorithms and data structures. Philo tackles the "Dining Philosophers" problem with multi-threading. Minishell involves creating a basic shell to execute commands and manage processes. Lastly, cube3d is a 3D game p utilizing raycasting techniques in C. Through these projects, I gained significant experience in developing algorithms, creating architectures, and learning how to work as a team.

TIKA - NJORD
- As a member of the autonomous vehicle team, ITU Autobee, I worked in the electronics department, programming embedded software with Arduino and STM32. We participated in Teknofest and the international NJORD competition, where we secured first place.

my_first_autonomous_car
This was my first project in the embedded world, which I coded with Arduino and Python. Our project won the competition held at my previous university.

Related Skills and Hands-on Experience

- Verilog - VHDL
- RISC-V - SoC - FPGA
- C/C++, Python, Jenkins, TCL
- Computer Organization and Digitial Design
- Cryptography - Private Key - Public Key
- Embedded Software - STM32, Arduino
- Digital Signal Processing
- AXI - UART - I2C

Related Tools

- Xilinx - Vivado - Matlab - VS Code - Questa - Shell - Github

Soft Skills and Hobbies

- English - B2+
- Problem-solving, Teamwork, and Communication
- Robotics and Electronics
- Reading, watching arthouse movies, chess
- Walking and volleyball