

## SUMMARY

RTL design with Verilog · Experience in Embedded Design · PyTorch and OpenCV experience · Coding skills in C, modern C++, Python, Java, SQL · TAsip experience

## EDUCATION

**PhD in ECE, January 2023 – Present, University of Arizona, Tucson AZ, USA**

Advisor: Ali Akoglu

**BSCS, September 2018 - January 2023, Ozyegin University, Istanbul, Turkey (GPA: 3.73/4.00)**

## EMPLOYMENT

**Research Assistant at University of Arizona, Tucson AZ, USA, January 2023 – Present**

Designing software and hardware architectures for highly heterogeneous high-performance computing systems.

**Undergraduate Research Assistant at TUBITAK, Istanbul, Turkey, September 2021 – December 2022**

Developing a deep neural network to solve a Computer Vision problem.

**Undergraduate TA at Özyeğin University, Istanbul, Turkey, February 2020 – June 2020**

Assisted the following courses: Calculus for Engineering I/II (MATH103 and MATH104)

**Part-Time Student Employee at Özyeğin University, Istanbul, Turkey, March 2019 – February 2020**

Entered visitor records to the HSE system, printed student cards for students who lost their cards.

## PUBLICATIONS

**Suluhan, H. U., Ates, H. F., & Gunturk, B. K. (2022, November). Dual Camera Based High Spatio-Temporal Resolution Video Generation For Wide Area Surveillance.** In 2022 18th IEEE International Conference on Advanced Video and Signal Based Surveillance (AVSS) (pp. 1-8). IEEE.

## PROJECTS

**Senior Project: “Rapid Deployment of PyTorch Workflows on Heterogeneous SoC” (February 2022 - January 2023)**

I developed an automation tool that enables rapid integration and development of PyTorch neural network models on Domain Specific SoC (DSSoC) architecture without requiring any Verilog or CUDA knowledge. I used recently emerged DSSoC framework called Compiler-integrated, Extensible DSSoC Runtime (CEDR) for the deployment and resource management phase. During the process, CEDR compatible counterpart of PyTorch workflow through the automation tool with minimal coding from the application developer. Then, PyTorch model is executed on a DSSoC architecture by utilizing CEDR runtime. Thanks to this flow, application developer is able to seamlessly run their application on an heterogeneous SoC architecture without becoming an hardware expert.

**TUBITAK-1003: WAS, “Smart Camera System For Wide Area Surveillance” (September 2021 - December 2022)**

The goal of this project was to generate a high-quality video feed from two distinct videos that are high resolution - low frame rate (HSR - LFR) and low resolution – high frame rate (LSR - HFR). To achieve this goal, we developed a model called HSTRNet with two different models which uses same theoretic background called reference-based super-resolution and these models distinguish from each other on complexity levels. First model uses 2 HR – 3 LR providing competitive results with the tradeoff of runtime execution time. Therefore, we designed another model that takes 1 HR – 1 LR as input reducing the complexity of the model with a negligible drop on the accuracy.

**Negotiation Agent (March 2021 – June 2021)**

A negotiation agent was developed for the Artificial Intelligence Course (CS451). The negotiation agent is an AI which can negotiate on certain topics considering the negotiation domain, and preferences of each agent as well as its own preferences. An overall negotiation agent includes bidding strategy to offer a bid, acceptance strategy to accept or reject a given bid, and opponent modeling to predict opponent's preferences and strategies. Each agent's performance is evaluated in a tournament by taking the mean of utility results for each agent. Agent is developed using GeniusWeb and Java. Approximately 300 lines of code was written, and 30 hours was spent on this project.

**Safe Hotel System (March 2021 – June 2021)**

A digital circuit was designed and implemented for Microprocessors Course (EE321). The circuit includes PIC16 MCU, LCD, numpad, motor driver and two motors. The circuit serves as a digital password system for hotels. Users can open/lock motors entering unique passwords of each motor and can change passwords. The circuit is designed on Proteus, and PIC16 code is compiled on MikroC. Approximately 300 lines of code was written, and 30 hours was spent on this project. (Source code is available at Github)

**VerySimpleCPU (March 2021 – June 2021)**

VSCPU is a “instruction set complete” CPU which is developed by H. Fatih Ugurdag for easy teaching purposes for Computer Architecture Course (CS240). The ProjectCPU is an RTL implementation of the VSCPU which is implemented as a class project. The ProjectCPU's instruction set consists of 8 instructions, which makes it “instruction set complete”. Approximately 200 lines of code was written, and 25 hours was spent for this project. (Source code is available at GitHub)