Eren Dogan

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SUMMARY

Coding skills in C/C++, Python, Java, JavaScript • RTL design with Verilog • Experience in PyTorch • TAship experience

EDUCATION

BSCS, June 2022 (expected), Ozyegin University, Istanbul, Turkey (GPA: 4.00/4.00)

EMPLOYMENT

Undergraduate TA at Ozyegin University, Istanbul, Turkey, September 2019 – June 2021
Assisted the following courses: Computer Programming (CS101), Digital Systems (EE203), Computer Architecture (CS240)

PROJECTS

OpenCache (April 2021 – Present): An open-source generator to create custom caches using OpenRAM's SRAM arrays. It generates a synthesizable Verilog file for cache logic and configuration files for OpenRAM to generate the internal SRAMs of the cache. OpenCache inputs a configuration file that includes various parameters about the desired cache such as total size, number of ways, replacement policy, etc. Additionally, OpenCache can use other EDA tools to verify the output cache through randomly generated testbenches. This generator is written in Python using the nMigen library, which is a Python to HDL toolkit. Wrote 6,000 lines in Python and spent approx. 1,000 hours net on this project. (Available online at GitHub.)

Linux USB Mouse Sound Driver (March 2021 – June 2021): A Linux device driver was developed for the Operating Systems course (CS350) at Ozyegin University. The kernel driver for USB mouse plays virtual click sounds when the physical mouse buttons are clicked. Wrote 300 lines in C and spent approx. 30 hours net on this project. (Available online at GitHub.)

Deep Compression for PyTorch Model Deployment on Microcontrollers (October 2020 – March 2021): Improving a “PyTorch to C generator” by applying compression methods on Convolutional Neural Networks (CNNs). Mr. Hasan Unlu of Tesla has developed a generator to deploy PyTorch models on microcontrollers (e.g. RISC-V SiFive FE310) efficiently. To improve this generator, I used pruning and quantization methods. Weights are saved as compressed sparse column (CSC) format to decrease memory usage and forward pass functions are improved to use CSC arrays directly without losing performance. Wrote 400 lines in Python, 50 lines in C, and spent approx. 150 hours net on this project. (Available online at GitHub.)

Secure Chat (October 2020 – January 2021): A chat application was developed for the Computer Networks course (CS447) at Ozyegin University. Client-server communication was developed using Python sockets. Encryption methods were used to implement end-to-end encryption for Internet chat. Wrote 500 lines in Python and spent approx. 15 hours net on this project. (Available online at GitHub.)

To-Do Manager (October 2020 – January 2021): A web application was developed for the Web Application Development course (CS391) at Ozyegin University. Users can add or remove to-do lists and to-do items to lists. Wrote 300 lines in JavaScript and spent approx. 10 hours net on this project. (Available online at GitHub.)

Image Processor JS (October 2020): An image processing simulator in JavaScript. Some image processing algorithms were implemented for educational purposes. Wrote 400 lines in JavaScript and spent approx. 15 hours net on this project. (Hobby project, available online at GitHub.)

Pathfinder JS (October 2020): A path finding simulator in JavaScript. Some shortest path finding algorithms for grid mazes were implemented for educational purposes. Wrote 600 lines in JavaScript and spent approx. 20 hours net on this project. (Hobby project, available online at GitHub.)

OutRun JS (June 2020 – July 2020): A game simulator for the arcade game OutRun in JavaScript. Pseudo 3D game engine (faking 3D projection in a 2D world) was developed for this project. Wrote 1,200 lines of JavaScript and spent approx. 40 hours net on this project. (Hobby project, available online at GitHub.)

VerySimpleCPU (February 2020 – June 2020): A Verilog RTL implementation of ProjectCPU, which is a cross between VerySimpleCPU (a.k.a., VSCPU) and PIC16. VSCPU ISA was developed at Ozyegin University to make teaching Computer Architecture (CS240) easy. The RTL was simulated and then synthesized. As part of grading, it was deployed on FPGA. A project on automated customization of VSCPUs was funded by TÜBİTAK (Turkish NSF). VSCPU is a powerful MCU with only 8 instructions, and it is “instruction set complete.” See http://verysimplecpu.org/ and http://cpu.tc/. Wrote 200 lines of Verilog and spent approx. 25 hours net on this project.

Simple Games in Java (July 2019 – February 2020): Chess, Snake, Pacman, Minesweeper, Solitaire, Tetris, Uno, and Monopoly games were developed in Java to gain and improve coding skills. Wrote 8,000 lines in Java and spent approx. 200 hours net on these projects. (Hobby projects, available online at GitHub.)

PUBLICATIONS

Eren Dogan, H. Fatih Ugurdag, and Hasan Unlu. “Deep Compression for PyTorch Model Deployment on Microcontrollers,” arXiv:2103.15972, 2021.

Eren Dogan, H. Fatih Ugurdag, and Matthew Guthaus. “OpenCache: An Open-Source OpenRAM Based Cache Generator,” Article No. 21, Workshop on Open-Source EDA Technology (WOSET), 2021.

MISCELLANEOUS

TOEFL iBT score of 103 out of 120 (October 2020)
Top ranking student in the class of 2022 within engineering majors