AHMED ABUHJAR

(EIT)

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ahmed-abuhjar

Electrical engineering student possessing excellent skills in RTL design and front-end implementation. Seeking full-time or internship opportunities to provide elegant solutions by utilizing developed design and verification skills.

Skills

SCRIPTS AND PROGRAMMING LANGUAGES

Verilog
VHDL
SystemVerilog
Python
C
C++
MATLAB
Java

ELECTRONIC DESIGN AUTOMATION SOFTWARES (EDA) / CAD

Cadence Virtuoso
Intel Quartus Prime
EAGLE

SIMULATION AND APPLICATION SOFTWARES

ModelSim
Xilinx Vivado
ChipScope
OrCAD PSPICE

PROTOCOLS

PCIe
AXI
ACK/NACK
MOESI

OTHER SKILLS

RTL Design
Tomasulo
Computer Architecture
Semi-Custom Design
GPGPU

Education

University of Southern California
Master of Science, Electrical Engineering - VLSI design | May 2021
GPA : 3.91/4.00
Courses: (EE560) Digital System Design, (EE577a, EE577b) VLSI System Design, DFT (EE658), (EE552), (EE457), (EE477L), (EE582), (EE590)

Iowa State University
Bachelor of Science, Electrical Engineering - 3.5 years | May 2019

Passed Fundamentals of Engineering Exam (EIT) (Oct. 2019)

Projects

Physical Layer Design (Tx and Rx) of PCIe protocol May 2020 - July 2020
- Implemented clock gating, 8b/10b Decoder and Encoder, Elastic Buffer, Deskew Buffer in Verilog.
- Integrated, simulated and synthesized the complete design using Xilinx Vivado and debugged using ChipScope.

Tomasulo-based processor system implemented in VHDL May 2020 - July 2020
- Designed Re-Order Buffer in VHDL to achieve in-order commitment and to support exceptions.
- Implemented Register-Renaming using Register Aliasing Table to solve WAW and WAR hazards.
- Fulfilled branch prediction and speculative execution beyond branch with help of Branch Prediction Buffer and Return Address Stack.
- Achieved Copy-Free-Checkpointing to restore pipeline status upon branch mis-predictions.
- Simulated design using ModelSim, synthesized on FPGA, tested for numerous instruction streams and debugged with help of ChipScope.

IoT Environmental Monitoring System August 2018 - May 2019
- Designed a low-cost hygroscopic soil moisture sensor to detect change in moisture level.
- Designed low-cost custom PCBs for sensor nodes to receive and transmit signals between each other and the network gateway.
- Tested sensors under various environmental conditions to calibrate and determine moisture level range in which the sensors operate as linear devices.
- Exchanged project ideas with team members to assure building a strong sense of reciprocity.

Digital VLSI - RTL Design - Analyzing temperature readings August 2018 - December 2018
- Designed, simulated and synthesized Verilog code using ModelSim to analyze Average and Standard Deviation of temperature samples relayed from sensors in IoT network.
- Implemented a Test-bench to verify functional correctness of design using several types of input stimulus.

VLSI Semi-Custom CMOS Design - Temperature Sensor Using Diodes January 2018 - May 2018
- Utilized Cadence and ModelSim to design circuits including PTAT, ADC, and 7-segment display.
- Implemented Python code to generate vector files to simulate and test the design and to improve its accuracy of measurements to 2 degrees Celsius.
- Performed DRC and LVS tests on layouts to ensure all circuits meet fabrication rules and match schematics before fabrication.

Experience

USC - Mentor for MOS VLSI Circuit Design (EE 477L) - Los Angeles, California January 2021 - Current
- Conducted laboratory discussions online via Zoom to discuss with students several techniques of CMOS design using Cadence.

Whirlpool Corporation - Controls Engineer Internship - Middle Amana, Iowa June 2017 - January 2018
- Delivered cost saving and quality projects resulting in decreased production cost, lowered service incident rate SIR and reduced failure caused by workmanship at production line.
- Built working partnerships with suppliers to ensure product quality and improved performance scorecard.

Iowa State University - C Teaching Assistant - Ames, Iowa January 2017 - May 2017
- Organized practical C programming supplemental lectures and tutored students to help understand programming and develop problem solving and debugging techniques.