SUHAIL BASALAMA

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EDUCATION

University of Arkansas Fayetteville, AR
B.S. in Computer Engineering | Cumulative GPA: 4.0 Dec. 2019

University of Arkansas Fayetteville, AR
B.A. in Political Science | Cumulative GPA: 4.0 May 2020

RESEARCH INTERESTS

- Computer Architecture
- Heterogeneous Computing
- Parallel Computing
- Reconfigurable Computing
- FPGA Acceleration
- Machine Learning Acceleration

RESEARCH EXPERIENCE

University of Arkansas | Computer Systems Design Laboratory Jan. 2019 - Current
Research Assistant | Dr. David Andrews
ARray Processor Project: Four different SIMD array processor architectures on the Xilinx Virtex-7 FPGA VC707 for machine learning and image processing applications

- Built a MicroBlaze System-on-Chip (SoC) with external BRAM for the array instructions
- Designed, implemented, and packaged an Instruction Sequencer AXI IP in Verilog
- Designed, implemented, and packaged four complete array processor systems made of:
  Top-level Modules, Interconnect, Controllers, and Processing Elements (Serial/Parallel ALU and Register File)
- Devised an approach to map 16 1024-bit register files to RAMB18 vertically for efficient memory utilization
- Manipulated the Booth's and Modified Booth's algorithms to get rid of the shift operations (1.88X speedup)
- Compared the four systems in terms of performance, resource utilization, memory, and power
- Working on implementing an LSTM Benchmark on our systems

University of Arkansas | Smart Embedded Systems Lab May 2018 – Jan. 2019
Research Assistant | Dr. Christophe Bobda
ARLO Robot: An Autonomous ground vehicle built using the Parallax Arlo Robot System and the Digilent Zybo Z7-20 FPGA

- Built a Zynq-7000 SoC with UART IP and a custom Sensor IP I made
- Built a Petalinux system on the SoC and configured the kernel with the necessary module
- Installed and configured the Robot Operating System Kinetic Kame on the top of the Petalinux

Cryptocurrency Wallet: A hardware-based wallet with end-to-end encryption for cryptocurrency on the Lattice iCE40 Ultra Wearable Development Platform

- Helped develop communication interface between the FPGAs and a Smart Phone using UART and Bluetooth LE
- Helped implement and package AES encryption algorithm in Verilog on FPGA and on the smart phone end in Python

TECHNICAL SKILLS

- **Languages:** Verilog, VHDL, C, C++, Python, Java, Xilinx Tcl, Bash, Assembly
- **CAD Tools:** Modelsim, Vivado HLx, Vivado HLS, Synopsys Design Vision, Quartus, Petalinux, Robot Operating System
- **Design Skills:** System-on-Chip, IP packaging, Static Timing Analysis, Algorithms, Finite State Machines, RTOS
- **Technologies:** FPGAs (Xilinx, Altera Intel, Lattice), Raspberry Pi, Arduino, Microprocessors, Microcontrollers, sensors
- **Operating Systems:** Windows, Linux, MacOS

Teaching Experience

University of Arkansas | Digital Design CSCE 2113 Aug. 2019 - Current
Teaching Assistant | Dr. Patrick Parkerson

- Teaching 30 students in two lab sections the fundamentals of digital and hardware including: Number Representation, Combinational/Sequential Circuits, Optimizing Logic Functions, Breadboarding, Flip-Flops, Registers, Counters, Lookup Tables, Hardware Description Languages (VHDL)
- Holding office hours to assist students with the class or lab material
- Grading and correcting students' assignments, quizzes, lab reports, and exams

Chegg Inc. | Online Tutoring Aug. 2017 – Current
Computer Science Tutor | Part-Time

- Taught more than 30 students in various subjects including computer science, C++, and Java
- Helps refresh my knowledge and exposes me to a wide variety of computer science problems

Relevant Coursework

- Core courses: Digital Design, Computer Architecture, System Synthesis and Modeling, Embedded Systems
- Elective courses: Algorithms, Artificial Intelligence, Machine Learning (CSCE 5063), Wearable and Ubiquitous Computing, Mobile Programming

Honors and Awards

2019 The Foundation for the International Exchange of Students Scholarship at UARK
2019 Dr. Henry M. Alexander Memorial Award
2019 Rosecrans, Sr Endowed Memorial Scholarship
2018 The Charles D. Brock Scholarship by the College of Engineering at UARK
2018 The Foundation for the International Exchange of Students Scholarship at UARK
2017 The John and Marie Lavallard International Scholarship at the University of Arkansas
2017 The University of Arkansas Transfer Student Scholarship
2014 The Silver Medal Representing Yemen in The Third Gulf Mathematics Olympiads in Oman
2013 The Top-Ten Student Ministerial Scholarship from the Yemeni government
2013 Ranked 9th among more than 200,000 Yemeni students in The National High-school Exams (0.000005%)

Publications

In the process of writing a paper to demonstrate our findings and contributions for the ARray Processor Project

Standardized Tests

GRE | Quantitative: 166 (P_{89}), **Verbal**: 155 (P_{68}), **Analytical Writing**: 4 (P_{57}) Aug. 2019
TOEFL iBT | Total: 93, **Reading**: 23, **Listening**: 27, **Speaking**: 22, **Writing**: 21 Dec. 2014

References

Dr. David Andrews, Professor
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Dr. Christophe Bobda, Professor
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