Valeriia Rubanova

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Education

Georgia Institute of Technology | Atlanta, GA *August 2019 - Present*
Bachelor of Science in Computer Engineering, 3.52 *Expected Graduation, May 2024*
Minor in Robotics: Perception and Autonomy

Skills

Programming: C, C++, Perl, Rust, Python, assembly, shell scripting, Java, MatLab, Golang
Platforms: MacOS, Linux, Windows, Unix, AWS, CUDA, PyTorch, CMake, Docker
Hardware: VHDL, Verilog, SystemVerilog, Raspberry Pi, SDRs, ARM-based microcontrollers, FPGAs, spectrum analyzer, logic analyzer, Arduino, PCB, Xilink
Software: Altera Quartus, GitHub, LLVM, iMovie, WireShark, Cadence Virtuoso, Chisel, Altium, LTSpice
Professional Organizations: Women in Electrical and Computer Engineering, GT Society of Women Engineers
Communication: Design proposals, technical reports, documentation, presentations

Work Experience

Oxos Medical | Atlanta, GA *Summer-Fall 2023 (Present)*
Systems Integration Intern
- Developed comprehensive testing environment of product's firmware to verify its performance and reliability
- Developed firmware simulator for a medical device to enable efficient software prototyping and testing
- Developed power-on self-test script for a medical device and integrated it into bootloader
- Responsible for development and improvement of the network management on a medical device both in software and hardware
- Developed custom library for configuring and interfacing with HID sensors

Intel Corporation | Folsom, CA *Summer-Fall 2022*
SoC Design Verification Engineering Intern
- Developed script for parameter tracking flagging across project history to enable more efficient performance analysis
- Developed script for capturing error information in SoC model validation flows for convenient review and enhanced error profiling across multiple projects
- Developed script finding and resubmitting failed validation jobs to HPC tool with updated parameters in less than 10 seconds for improved efficiency
- Conducted synthesis and validation flows for SoC models and generated error reports across multiple projects

Cognosos, Inc. | Atlanta, GA *Fall 2021*
Engineering Intern
- Assisted in development of the new generation of automated design verification and quality assurance testing tools for a real-time asset tracking product
- Developed an automatic calibration script for SDR-based tracking tags
- Developed script and corresponding web application for generating aggregate RF heat maps for real-time location tracking products

Projects

FPGA Accelerator for Machine Learning *Summer 2023*
- Implemented FPGA-based accelerator for convolutional neural networks to improve learning speed by 10%

User Behavior Analytics for Security | Machine Learning Project *Spring 2023*
- Worked in a team of 5 to create a machine learning model assisting in data security by analyzing user behavior patterns and predicting user's future actions; model recognizes unusual user behavior and alerts system about possible breach
- Utilized KNN clustering, Naive Bayes and neural networks to determine the most efficient algorithm for model's purpose

Secure Hardware | Undergraduate Research Assistant *Spring-Fall 2023*
- Developed TCP-based communication protocol between microcontrollers for proof-of-concept verification
- Contributed to developing custom encryption/decryption algorithm in software and corresponding regression testing environment
- Assisting in computer vision architecture-based attacks research collaboration with foreign university

ImmerseGT | Virtual Reality Hackathon *Spring 2023*
- Worked in a team to create MVP that makes cognitive-behavioral therapy more accessible and personalized through use of machine learning and VR
- Designed pre-processing of textual prompt to machine learning algorithm input and post-processing of algorithm output to 3D visualization of the prompt

VLSI Circuit Design *Spring 2022*
- Designed AND, OR, XOR, NAND and NOR logic gates to implement 4-bit multiplier and adder, and 8:1 multiplexer

Embedded Systems Design Project | 3D Asteroids Game *Fall 2022*
- Developed 3D Asteroids video game with mbed as controller and computer rendering graphics through openGL GLUT library

Advanced Computer Architectures Projects *Spring 2022*
Simulator of L1 cache with a victim cache, and L2 cache
- Built a simulator for the cache hierarchy with sizes of caches and blocks, insertion policy and associativity as input parameters

Branch predictor simulator
- Built a simulator modeling set of TAGE tables and GShare with global history register, with size of the predictor and hash function as input parameters

Out-of-order processor simulator with support for precise interrupts
- Implemented a CPU simulator using tagged Tomasulo with a modified version of Total Store Ordering
- Parametrized size of cache, number of execution units, reservation stations, fetch and retire bandwidths, number of entries in ROB as inputs to the simulator

Cache Coherence Simulator
- Built multiprocessor cache coherence simulator with agent and directory controllers in point-to-point network

Relevant Coursework

Architecture, Systems, Concurrency and Energy in Computation; Advanced Computer Architectures; Hardware-Oriented Security and Trust; Embedded Systems Design; VLSI & Advanced Digital Design; Data Structures & Algorithms; Digital Systems Design; Cryptographic Hardware for Embedded Systems; Intro to Perception and Robotics; Computer Networking; Machine Learning; Privacy Technology, Policy and Law

Leadership

Women in High-Performance Computing, GT chapter | Atlanta, GA *June 2021 - Present*
Director of Event Planning and Marketing
- Organized and facilitated virtual HPC Poster Competition with more than 50 attendees from 3 different universities
- Assisted in organizing virtual seminar with three Georgia Tech HPC researchers and HPC hackathon
- Organized in-person symposium with six HPC industry and academia speakers