Ahmer Raza

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Education

Clemson University Expected May 2024
B.S. Computer Science (4.00 / 4.00 GPA) *Clemson, SC*

Experience

Honors Thesis Research Spring 2024
Hardware Cybersecurity Research with Dr. Zhenkai Zhang *Clemson University*

- Conducting research to build a secure automotive Electronic Control Unit (ECU) for connected vehicles using RISC-V and Keystone Enclave.
- Secure ECU will serve as a root of trust, providing a layer of defense against present- and zero-day vulnerabilities.

Senior Capstone Fall 2023
Industry Collaboration with Arccos Golf *Clemson University*

- Created a custom user map correction feature for industry partner Arccos Golf to be integrated into their Arccos Caddie product line.
- Project wireframes developed with Figma. Map correction feature was developed as a standalone app using Expo, React Native, Node, Git/GitHub, TurfJS, and the GeoJSON specification.
- Spearheaded technical development and led a team of 5 using Agile methodologies.

Undergraduate Research Summer 2023 – Fall 2023
GPU Cybersecurity Research with Dr. Zhenkai Zhang *Clemson University*

- Conducted research evaluating the feasibility, effectiveness, and mitigation techniques of bit disturbance attacks such as Rowhammer and RowPress launched from discrete GPUs on motherboard DRAM.
- Conducted research evaluating the susceptibility of GPU GDDR5 and GDDR6 DRAM to bit disturbance errors using bit disturbance attacks.
- Conducted research evaluating the feasibility of reverse-engineering the TRR mechanism on GPU GDDR6 DRAM.

Projects

MIPS Simulator

- Cycle-accurate command-line simulation of a MIPS pipelined processor. Handles `lw`, `sw`, `beq`, `add`, `sub`, `and`, `or`, `slt`, and `j` instructions. Dynamically detects and handles data and control hazards.
- The Python `curses` library was used to provide the terminal GUI. The MVC architectural pattern and Observer design pattern were used to organize the program.

C-Natural

- Custom programming language and transpiler made to facilitate beginners' learning of advanced programming concepts. Developed for CUHackit 2023.
- Contains parser/lexer written from scratch in C++. Uses line-by-line conversion with dynamic scope handling to transpile C-Natural code to C++.

C Server

- Simple HTTP parser and web server written in C. Serves a single file, buffered in memory or unbuffered using sockets.

Technical Skills

Programming Languages: C, C++, Java, Python, JavaScript, TypeScript, HTML, CSS
Technologies: React.js, Vue.js, Express.js, Expo, React Native, jQuery, Bootstrap, Node.js, NPM, Electron, Android SDK, iOS SDK, Git, GitHub, Arduino, PlatformIO, Verilog, VHDL, Intel Quartus II, Xilinx Vitis/Vivado, Solidworks, KiCad, EasyEDA, Raspberry Pi 4, Raspberry Pi Pico, Digilent Arty A7-100T
Concepts: Operating Systems, Virtual Memory, Computer Architecture, Hardware Cybersecurity, DRAM Hardware Design, Circuit Design, FPGA Programming, Advanced Cryptography, Artificial Intelligence, Machine Learning, APIs, Databases, Fullstack Web Development, Agile Methodology