

Ahmer Raza

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EDUCATION

Clemson University B.S. Computer Science, Mathematics minor 4.0/4.0 GPA	Clemson, SC August 2021 – May 2024
Clemson University M.S. Mathematics, Statistics concentration	Clemson, SC August 2024 – August 2025 (expected)

HONORS & AWARDS

SoutheastCon 2024 Hardware Competition 1st place in Hardware Competition at SoutheastCon 2024	March 2024
Garrison Family Annual Scholarship	2023 – 2024
Frank M. Gunby Memorial Scholarship	2023 – 2024
South Carolina LIFE Enhancement	2022 – 2024
South Carolina LIFE Scholarship	2021 – 2024
Clemson University Scholarship	2021 – 2023
Clemson University President's List Awarded President's List for all semesters at Clemson	Fall 2021 – Fall 2023
GaSTC Gold Medal 1st place in Project Programming at the Georgia Student Technology Competition	March 2019

MEMBERSHIPS

IEEE Clemson Student Branch Leadership Webmaster for the IEEE Student Branch at Clemson	Spring 2024
IEEE Student Member	Spring 2024 – present
ACM Student Member	Spring 2024 – present
Alpha-Lambda-Delta Honor Society	Spring 2022 – present
Clemson University Honors College	Fall 2021 – present

RESEARCH EXPERIENCE

Honors Thesis Research <i>Hardware Cybersecurity (advisor: Dr. Zhenkai Zhang)</i> <ul style="list-style-type: none">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.	Spring 2024 – present
Research <i>GPU Cybersecurity (advisor: Dr. Zhenkai Zhang)</i>	Summer 2023 – Fall 2023

- 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 feasibility of reverse-engineering the TRR mechanism on GPU GDDR6 DRAM.
- Conducted research evaluating the susceptibility of GPU GDDR5 and GDDR6 DRAM to bit disturbance errors using bit disturbance attacks.

Creative Inquiry

Fall 2023 – present

Robotics Systems Research

- Designed a rigid-bodied autonomous robotic system for IEEE SoutheastCon 2024 as part of a team.
- The robot included a chassis/drivetrain module, sensing modules, and an object manipulation module.
 - Chassis included two-wheel drive to allow for in-place steering using omni wheels.
 - Sensors worked with include DC motor encoders and line-following, time-of-flight, and light sensors.
 - Object manipulation module encompassed a three degrees-of-freedom (df) “hard” robotic arm with a one df gripper end effector.

Nanotechnology

- Conducted review research on quantum computing and the role of nanotechnology, nanomaterials, and nanodevices in quantum computing.

Circuit Cellar

- Designing and implementing a Printed Circuit Board (PCB) using Electronic Design Automation (EDA) tools.

Senior Capstone

Fall 2023

Arccos Golf

- Created a custom user map correction feature for industry partner Arccos Golf to be integrated into their Arccos Caddie product line.

POSTERS & PRESENTATIONS

- [1] **A. Raza** et al., “ROAR-E: a Winning Autonomous Robot for the IEEE SoutheastCon 2024 Hardware Competition,” Clemson Focus on Creative Inquiry, Clemson University, Watt Family Innovation Center, Apr. 3, 2024.
- [2] **A. Raza** et al., “Nanotechnology for Emerging Applications,” Clemson Focus on Creative Inquiry, Clemson University, Watt Family Innovation Center, Apr. 4, 2024.
- [3] **A. Raza** et al., “Circuit Cellar,” Clemson Focus on Creative Inquiry, Clemson University, Watt Family Innovation Center, Apr. 5, 2024.
- [4] **A. Raza** et al. (2023). “Clemson Capstone and Arccos”. Available: <https://tinyurl.com/arccos-presentation>

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.

C-Natural

- Custom programming language and transpiler made to facilitate beginners’ learning of advanced programming concepts. Developed for CUHackit 2023.

C Server

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

Periodic Table

- Interactive Java-based Periodic Table app with extensive information about each element.
- Won 1st place in Project Programming at GaSTC 2019.

SKILLS

Programming Languages

- C/C++
- Java
- Python
- JavaScript/TypeScript
- HTML/CSS

Software Tools

- Git/GitHub
- NodeJS/NPM platform
- Arduino/PlatformIO
- Intel Quartus II Design Software
- Xilinx Vivado Design Suite
- Solidworks 3D design
- KiCad/EasyEDA

Hardware Experience

- Raspberry Pi 4 computer
- Raspberry Pi Pico MCUs
- Digilent Arty A7-100T with Xilinx Artix-7 FPGA
- Through-hole PCB and SMD soldering
- 3D printing

Personal Interests

- Reading
- Traveling
- Horseback riding
- Swimming
- Rifle target shooting
- Golf