

# Yuchao Su

Raleigh, NC

📞 781-827-1368 ✉️ ysu34@ncsu.edu 🌐 yuchaosu.com

## Education

---

### North Carolina State University

*PhD in Computer Science, Advisor: Dr. Frank Mueller*

2024 – Present

*Raleigh, NC*

### Northeastern University

*Master of Science in Electrical and Computer Engineering*

2021 – 2023

*Boston, MA*

### Southeast University

*Bachelor of Engineer in Computer Science and Technology*

2017 – 2021

*Nanjing, China*

## Skills

---

**Languages:** C++, Go, Python, Cuda, Java, Verilog, R, SQL

**Developer Tools:** Vivado, VS Code, Visual Studio, IntelliJ, Android Studio, Perforce, Jira

**Tech Stack:** Linux, OpenMP, ROS, Git, Arduino, Springboot, Hadoop

## Experience

---

### Research Assistant

*Department of Computer Science, North Carolina State University*

Jan 2025 – Now

*Raleigh, NC*

### Teaching Assistant

*Department of Computer Science, North Carolina State University*

Sept-Dec 2024

*Raleigh, NC*

- CSC246 Concepts and Facilities of Operating Systems for Computer Scientists

### Teaching Assistant

*Department of Electrical and Computer Engineering, Northeastern University*

Spet 2021 – Aug 2022, Jan-June 2023

*Boston, MA*

- EECE2160 Embedded Design: Enabling Robotics
- EECE2322 Fundamentals of Digital Design and Computer Organization
- EECE3324 Computer Architecture & Organization
- EECE2560 Fundamentals of Engineering Algorithms

### Software Engineer Intern

*Electronic Arts*

Sept-Dec 2022

*Orlando, Florida*

- Developed a Python script to perform statistical analysis on backend logs of Madden NFL and CollegeFB, enabling insights into top-ranked logs and enhancing data management capabilities.
- Achieved significant log reduction of 80%, reducing Madden and CollegeFB backend logs from over a million items to 200,000 to 300,000 items, leading to improved storage efficiency by reducing the log file size from over 200MB to approximately 20MB.
- Leveraged the PS5 Razor CPU tool to enhance the runtime efficiency of the RELEASE version, resulting in a notable performance improvement of 20%, thereby optimizing the processing speed and overall efficiency of the script.

## Projects

---

### SpGEMM Acceleration for Quantum Simulation | C++, Architecture, SpGEMM

Aug 2024- June 2025

- Improve conventional systolic array for diagonal matrix multiplication.
- Design 2-dimensional high parallelism blocking strategy.
- Reduce the time complexity from  $O(3n)$  to  $O((2n - 1)CombinedDiagonalDensity + n)$ , which is much less than  $O(3n)$  in sparse matrix
- Achieved 33x speedup on performance on average compared to SOTA SpGEMM algorithms.

### Zeonica Simulator | Go, CGRA, Wafer-Scale Engine Repo [github.com/sarchlab/zeonica](https://github.com/sarchlab/zeonica)

Aug 2023- Aug 2024

- Zeonica is a simulator for CGRA and wafer-scale accelerators.
- Zeonica is developed by Go and based on Akita Simulator Engine
- Zeonica now is successfully support data pass through, ReLU and matrix multiplication.

**Chip Thermal Control** | *Python, Pycharm, Reinforcement Learning***Apr 2023**

- Developed a Python-based chip thermal control system with dynamic frequency management trained using the DQN algorithm, optimizing temperature regulation and performance.
- RL-based strategy in the system achieved a notable 20% reduction in chip temperature compared to traditional DVFS, maintaining performance integrity.
- Successful implementation of RL techniques in the chip thermal control system showcased efficient temperature management, advancing chip design capabilities and mitigating overheating risks.

**Rescue Robot** | *C++, ROS, SLAM, OpenCV***Sept-Nov 2021**

- Developed an automatic robot by C++ and ROS to find and locate victims in a enclosed space
- Displayed map of enclosed space, robot and victims locations by Rivz
- Utilized Gazebo simulation tool to create test environment, test algorithm and modify key parameters
- OpenCV is implemented to process the acquired image to make it a binary image and to obtain approximate orientation of the victim

**RISC-V CPU and Peripherals** | *Verilog, Vivado***Sept-Dec 2020**

- Lead a team of three to design a RISC-V, 7-stages Dual-Launch Chaotic Superscalar Processor and deployed on customized Xilinx board
- Developed drives for LCD touchscreen, Bluetooth, WiFi, LED, digital tubes, switches
- According GB2312-80 protocol, design character library and 16\*16 character model to present words on screen
- Develop a simple Tetris game in order to test CPU and peripheral

**Extracurricular/Awards**

---

**Suzhou Industrial Park Scholarship****2020***School of Computer Science and Engineering, Southeast University**Nanjing, China*