Ashwin Rohit Alagiri Rajan

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Education

- **University of California, San Diego** — San Diego, CA
  Master of Science in Computer Engineering — *2024 - 2026*
  Bachelor of Science in Computer Engineering — *2020 - 2024*

Honors

- **Warren Provost Honors** — San Diego, CA
  University of California, San Diego — *Received 2021*

Publications

- **Reducing the Carbon Footprint of EdTech with Repurposed Devices** — Austin, TX
  IEEE 15th International Green and Sustainable Computing Conference (IGSC) — *Nov 2024*
  - **Summary**: Co-authored a paper on system design and performance benchmarking of containerized EdTech applications using local clusters of upcycled Android devices. Demonstrated resource optimization, hybrid computing strategies, and benchmarking techniques for educational workloads, with an emphasis on sustainable and accessible computing environments. (DOI: 10.1109/IGSC64514.2024.00020)

Experience

- **Qualcomm Institute** — San Diego, CA
  Research Intern — *Jul 2023 - Jul 2024*
  - **C++/CUDA**: Developed pipeline to simulate physics based audio raytracing for HRTF measurement simulation using SonicArts' Space3D audio raytracing system
- **University of California, San Diego** — San Diego, CA
  Researcher — *Jul 2024 - Present*
  - **C++/Robotics**: Worked with C++/CUDA to create GPU accelerated autonomous pipelines for UAVs
  - Evaluated GPU and SIMD accelerated CPU pipelines for common robotics pipelines
  - Worked under Prof. Hadi Esmaeilzadeh at under PhD candidate Hanyang Xu
- **Jacobs School of Engineering, UCSD** — San Diego, CA
  Teaching Assistant, CSE 160 — *Jan 2025 - Mar 2025*
  - **CSE 160**: Held a TA position for CSE 160, the undergrad GPU Programming Class at UCSD under Prof. Ryan Kastner
  - **CUDA to OpenCL**: Responsible for converting class material from CUDA to OpenCL for compatibility with more devices.
  - Held Office Hours and discussion sections for students and assisted in solving problems on Q/A boards.
  - Proctored examinations and assisted in creating test materials and homework materials for the class.

Projects

- **Autonomous Drone — RobotX**: Built prototype based on the S500 drone retrofitted with Nvidia Jetson for onboard computer vision processing. Drone capable of object detection, tracking, and localisation.
- **Custom ISA and Processor**: Created custom 9 bit embedded MIPS like ISA and Processor in Verilog. Capable of pipelined operations and tailored for ECC applications with hardware support for Hamming ECC.
- **C++ Raytracer**: Created a parallelised raytracer from scratch in C++. Works with Bounding Boxes and parallelised with multithreading. Implements Blinn-Phong Reflection Model.
- **Bluetooth Microcontroller Programming**: Programmed the TI CC 2650 Microcontroller for BLE Central and Peripheral role devices. Works with custom accelerometer and haptic actuators. Capable to live transmission to BLE enabled phone for logging.

Programming Skills

- **Languages**: C++, Python, C, SystemVerilog **Technologies**: CUDA, OpenCL, OpenGL, Kubernetes, Docker, ROS