Ammar Ratnani

(281) 223 2900 | *aratnani@stanford.edu*
linkedin.com/in/ammar-ratnani | *github.com/ammrat13*

Education

Stanford University **|** M.S. in Computer Science — June 2025
- *Coursework:* Embedded Operating Systems, Networking, Computer Architecture, VLSI Design
- *GPA:* 4.2

Georgia Institute of Technology **|** B.S. in Computer Science — May 2023
- *Coursework:* Processor Design, Secure Computer Architecture, High-Performance Computing
- *GPA:* 4.0

Languages and Frameworks

Proficient: C, Python, Linux, Git
Competent: C++, Rust, Verilog
Familiar: CUDA, Vitis HLS, Catapult HLS

Work Experience

MINOTAUR / EE 372 **|** *Student Researcher* — Apr. 2025 - Jun. 2025
- Optimized the performance and area of this neural network accelerator
- Analyzed Catapult HLS schedules, Synopsys Design Compiler reports, as well as C++ and Python compiler code, to find performance bottlenecks
- Implemented changes that improved the performance of MobileBERT and ResNet-18 by 23% and 10% respectively, while reducing the area of the design by 3%
- Devised targeted fixes for softmax and max-pooling, reducing those particular layers' runtimes by 50% and 60% respectively

NVIDIA **|** *Software Engineering Intern* — Jun. 2024 - Sept. 2024
- Worked on increasing game performance on the GeForce Now cloud gaming platform, using Windows Performance Toolkit for collection and Python for analysis
- Created a dashboard to display CPU-side bottlenecks, including: parallelism, scheduling, inter-processor communication, hypervisor steal time, and interrupts
- Deep-dived the causes of a performance regression on Rainbow Six: Siege when running on AMD CPUs instead of Intel
- Extended automated benchmarks with three new stress-tests and one new game

The Aerospace Corporation **|** *Software Engineering Intern* — May 2023 - Aug. 2023
- Developed a fully autonomous ground station to receive images via radio transmission from the NOAA 15, 18, and 19 weather satellites
- Integrated a GNU Radio flowgraph with Python code to demodulate and synchronize Automatic Picture Transmissions in real time on embedded hardware
- Investigated decoding Differential Binary Phase-Shift Keyed transmissions from the NOAA GOES 16 weather satellite
- Constructed a prototype transpiler that ingests SysMLv2 and produces HSFL COSMOS configuration files, looking to use it in a CI/CD pipeline

Green Hills Software **|** *Software Engineering Intern* — Jun. 2022 - Aug. 2022
- Diagnosed performance bottlenecks in Green Hills' debugger on Windows, obtaining a 25% speedup by eliminating unneeded memory allocations and synchronizations
- Used PXE and Windows Deployment Services to install Windows in Green Hills' hypervisor
- Patched OVMF to make it compatible with Windows under the Green Hills' hypervisor

Projects and Contributions

Zynq 7000 HDMI Peripheral: https://github.com/ammrat13/meta-hdmi-dev — Mar. 2024 - Jun. 2024
Created an FPGA-based HDMI device, integrated it with the processor on this SoC, and exposed it as a framebuffer via a custom Linux kernel driver

LLVM Cross-Compiler for the LC-3.2: https://github.com/lc-3-2 — Feb. 2023 - Sept. 2023
Constructed a backend to generate assembly for a variant of the LC-3 instruction set. Ported both `newlib` and `coremark` to the new architecture to verify the compiler's correctness