Sai Kartik Tadinada

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Education

University of Wisconsin - Madison December 2025
Master of Science in Electrical and Computer Engineering, specialization in Embedded Systems *GPA : 3.7/4.0*
Relevant Courses: Advanced Computer Architecture 1, Advanced Computer Architecture 2, VLSI Design, High Performance Computing Applications, Wireless Communication

Birla Institute of Technology and Science November 2020 – June 2024
Bachelor of Engineering in Electrical and Electronics Engineering
Relevant Courses: Digital Electronics, Computer Architecture, Microprocessors, Satellite Communication

Engineering Experience

Western Semiconductor Inc March 2026 - Present
Firmware engineer *Tempe, AZ*
- Achieved zero-fault processor initialization and reduced simulation overhead by developing custom C-runtime routines, linker scripts, and CSR configurations.
- Achieved deterministic error recovery by engineering RISC-V trap handlers to catch and route hardware exceptions.
- Achieved reliable hardware-software communication and test output logging by engineering bare-metal drivers for memory-mapped I/O (MMIO) peripherals.

Analog Devices, Inc. July 2023 – December 2023
Embedded/Firmware Test Engineer *Bangalore, India*
- Developed **safety-critical software** standards (ISO 26262, ASIL-D) for EV BMS systems, analyzing system performance (physical and compute) against requirements for launch.
- Designed **robust Python frameworks with Pytest** to develop software with test-driven verification and automated validation testing for embedded firmware compliance.
- Designed appropriate **code abstractions** to allow code reuse and bring **verification time down by 50%**
- Performed bench, SIL (python) and **PCB-in-the-loop** testing for verification of developed software, utilizing STM32 microcontroller peripherals (ADCs, GPIOs, PWM, and SPI) for hands-on hardware bring-up and board-level debugging.
- Worked with various cross-functional teams in an Agile setting to **develop requirements and test plans for new BMS features, diagnostics, and algorithms**.
- Validated **low-level FW drivers** to support new and existing microcontrollers for features including **SOC, SOH and SOE**.

Projects

GPS-Guided Drone Autopilot with PID Control | *PSoC4, C, Python, Control Systems* May 2025 - September 2025
- Developed a **PID control system** for autonomous drone navigation to set GPS targets.
- Developed C firmware on a **PSoC4 microcontroller** to integrate the PID controller with GPS sensors

WISC-F24 ISA Pipelined Processor | *Verilog, GTKWave, Unix Systems* September 2024 - December 2024
- Designed a 5-stage pipeline processor on WISC-F24 ISA achieving efficient throughput with a predict not-taken policy
- Implemented a two-level write through cache, handled control and data hazards using full forwarding and stalling
- Verified the processor design using standard testbench and debugged using GTKWave and various assembly programs

Hardware security with FPGAs | *Zynq7000, C, Verilog, Vivado* January 2024 - May 2024
- Implemented and accelerated RSA and Blowfish encryption/decryption on hardware for high-speed performance.
- Converted C-based encryption algorithms into Verilog using High Level Synthesis for FPGA implementation.
- Designed, synthesized, and tested cryptographic algorithms on Zynq 7000 FPGA.

Ray Tracing with OpenMP | *CuDA, C++* October 2024 - December 2024
- Implemented Ray tracing operations with OpenMP, enabling higher performance with parallel operation and multiple CPU cores
- Achieved upto 3.62× improvement on 200 samples for the same image rendered without OpenMP

Technical Skills

Languages: Verilog, System Verilog, C/C++, Python, Perl
Tools: Git, GitHub, Jenkins CI/CD, Vivado, MATLAB, SIMULINK, KiCAD, LTSpice, Oscilloscopes/Logic Analysers, SPI, I2C, , Jenkins CI/CD, RTOS, , Make, Pytest, Artifactory
Technologies: Zynq 7000 FPGA, PSoC4, STM32, TI MSP430, Arduino, NodeMCU, Linux, JTAG, WiFi

Technical Leadership Experience

Team Anant May 2022 – August 2023
Team Lead for Electrical and Power subsystem *TI MSP430, ESP32, C, C++, KiCAD*
- Led a team of 6 members for a **top 10 position** in a student satellite competition **(CANSAT)**