

Kevin Maa

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EDUCATION

University of Central Florida

Orlando, FL

Bachelor of Science in Information Technology with Honors | GPA: 3.70

May 2027

Minor: Secure Comp & Networks | Honors: Burnett Honors College – University Honors

Relevant Courses: Computer Science I, Discrete Structures, Operating System Concepts, Security in Computing

Affiliations: IEEE UCF

PROJECTS

2026 SouthEastCon Robotics Competition – Group Project

Sep 2024 – Present

- Integrated Raspberry Pi 5 into Hardware-in-the-Loop (HIL) system for autonomous robot software development, configuring Docker containers, VSCode remote development, and Cloudflare tunneling to enable collaborative testing environment for 10+ team members.
- Testing micro-ROS packages on Raspberry Pi to validate real-time ROS2 communication protocols, ensuring reliable message passing between embedded systems before hardware integration with FPGA and ESP32 microcontrollers.
- Designing automated startup scripts for Docker container deployment to streamline robot boot process and reduce setup time during competition testing.
- Contributing to PCB design and layout for mini UAV flight controller, focusing on component placement, power distribution, and signal integrity for autonomous navigation systems.

KnightCore – FPGA Integration – 2025 AMD Hardware Competition – Group Project

Apr 2025 – Aug 2025

- Solely responsible for integrating custom GPU hardware module onto Red Pitaya Zynq FPGA platform using Vivado block design, connecting Zynq processor, AXI interconnect, BRAM controller/memory, configuring address spaces in the housekeeping region, and generating bitstreams, enabling team to focus exclusively on hardware design.
- Debugged memory-mapped I/O communication issues between ARM processor and FPGA programmable logic, identifying and correcting address mapping errors in shared memory regions to enable successful hardware integration.
- Developed and executed shell script and Python-based validation tests on Red Pitaya to verify register read/write operations and confirm successful processor-to-FPGA communication through memory-mapped interfaces.

RISC-V CPU – Solo Project

Jul 2025 – Present

- Designing a 32-bit single-cycle RISC-V processor from scratch on Red Pitaya FPGA, implementing the RV32I base instruction set with ALU operations, load/store instructions, and control logic using Verilog and SystemVerilog.
- Architecting datapath components including register file, arithmetic logic unit, instruction decoder, and control unit to execute instructions through fetch-decode-execute cycle.
- Developing verification infrastructure using UVM (Universal Verification Methodology) and formal verification techniques to validate instruction execution, register file operations, and memory interface functionality against RISC-V specification requirements.

4 Cluster PC Home Lab – Solo Project

Sep 2025 – Present

- Designing and deploying distributed computing infrastructure using 4 Mini PCs configured in a Proxmox High Availability cluster with ZFS replication for self-hosted services, network experimentation, and cybersecurity training.
- Implementing containerized services using Docker and Kubernetes for application deployment, alongside network security tools including Wireshark, Security Onion, and Kali Linux for penetration testing and threat detection.
- Configuring network segmentation with VLAN architecture, OPNsense firewall rules, and VPN tunneling through WireGuard to isolate services and implement enterprise-grade security best practices.

TECHNICAL SKILLS

Languages: C, Verilog, SystemVerilog, HTML, CSS, JavaScript, React, TypeScript, SQL, Python, Bash, Assembly (RISC-V)

Hardware Design & Verification: AXI Interconnect, Memory-Mapped I/O, BRAM, UVM, Formal Verification, Functional Verification, RISC-V ISA

Embedded Systems: Raspberry Pi, ESP32, ROS2, micro-ROS

Virtualization & Infrastructure: Proxmox, ZFS Replication, High Availability Clustering, Network Segmentation

Cybersecurity: Wireshark, Security Onion, Kali Linux, Penetration Testing, OPNsense, WireGuard VPN

Tools & Technologies: Git, GitHub, Linux, Windows, VSCode, Vivado, Docker, Kubernetes, Cloudflare, VLAN, PCB Design