Lakshmi Katravulapalli

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Education

University of Central Florida, Orlando, FL	**GPA:** 3.833/4.0
Master of Science in Computer Engineering	August 2025 – December 2026
Bachelor of Science in Computer Engineering	August 2021 – May 2025

Relevant Coursework: Computer Architecture, Digital Systems, Data Structures & Algorithms I & II, Discrete Structures, Object Oriented Programming, Computer Logic and Organization, Linear Circuits I & II, Electronics I, Embedded Systems, Massive Storage and Big Data, Operating Systems, Processes for Software Development, Programming Languages, Computer Communication Networks, Senior Design I & II

Technical and Soft Skills

- **Programming Languages:**
  C, C++, Java, Python, Verilog, Assembly Language, JavaScript, HTML

- **Frameworks & Libraries:**
  MERN Stack (MongoDB, Express.js, React, Node.js), LAMP Stack (Linux, Apache, MySQL, PHP), Pandas

- **Software & Tools:**
  Docker, Git/GitHub, VS Code, Eclipse IDE, Xilinx Vivado, NI Multisim, LTspice, Arduino IDE, Eagle PCB, Code Composer Studio, Microsoft Office Suite, Linux

- **Operating Systems & Environments:**
  Linux (Ubuntu, CLI), Windows Subsystem for Linux (WSL), Embedded Systems Development, Full-Stack Web & IoT Development
- Microcontrollers: TI MSP430FR6989, ESP32, BASYS 3, Arduino Uno

- **Hardware:**
  Embedded C Programming, Circuit Design and Analysis, PCB Fabrication, Prototyping, Breadboarding, Digital Multimeter, Oscilloscope, Soldering, Electrical Lab Equipment, FGPA

- **Soft Skills:**
  Leadership, Project Management, Communication, Concise Technical Writing, Critical Thinking, Multitasking, Hardworking, Team Collaboration, Creativity.

Technical Projects

Smart Safe Senior Design Project
August 2024 – April 2025

- Collaborated in a multidisciplinary team of four to design and implement a "Smart Safe" with biometric and keypad access, motion detection, and real-time email alerts.
- Programmed and tested embedded systems using C/C++ on the ESP32 microcontroller, integrating components including a fingerprint sensor, solenoid lock, LCD display, and motion sensor.
- Designed modular firmware architecture, using UART, GPIO, and EEPROM memory for secure configuration and persistent data.
- Authored and contributed to a 120-page final report and presented the system in a formal CDR presentation and live demo to the faculty panel.
- Developed a lockdown mode, tested 200+ use cases, and documented all system protocols, testing methods, and architectural decisions.

Tourist Event Recommendation App

October 2024 – December 2024

- Developed and deployed a MERN stack web application enabling users to explore, filter, and contribute local tourist events and destinations.
- Built a responsive front-end with React and TypeScript, and structured MongoDB data collections to support dynamic querying and filtering.
- Documented system design through use case, ER, sequence, and class diagrams, while coordinating with teammates using Git and API testing tools like Postman.

Personal Contact Manager Web Application

October 2024 – November 2024

- Developed and deployed a full-stack web application using the LAMP stack (Linux, Apache, MySQL, PHP), focusing on backend infrastructure and deployment.
- Designed and optimized a relational MySQL database with indexing to ensure efficient, secure storage and retrieval of user contact data.
- Configured and deployed the application on an Apache server in a Linux environment, managing file permissions and ensuring stable system performance.

Cisco Packet Tracer Network Simulation

November 2024

- Completed Cisco's official Packet Tracer course and earned certification in basic networking and simulation using routers, IP addressing, and static routing.
- Designed and configured a multi-router network topology in Cisco Packet Tracer, assigning IPs, subnet masks, and static routes to enable end-to-end communication.
- Verified connectivity using ping and tracert commands between end systems and routers, and documented routing behavior with screenshots, topology diagrams, and .pkt simulation files.

Junior Design Eagle Range Finder

May 2024 – August 2024

- Designed and fabricated a custom PCB for an ultrasonic range finder using Eagle PCB Design Software, with components selected for accuracy and compact layout.
- Programmed the MSP430 microcontroller to interface with sensors, and implemented real-time range calculations using embedded C.
- Conducted hardware debugging, functional testing, and validation of sensor accuracy, demonstrating hands-on proficiency in soldering, circuit troubleshooting, and system verification.

Embedded Systems – MSP430 Microcontroller Projects

May 2024 – August 2024

- Programmed the MSP430FR6989 microcontroller in C for real-time embedded applications, utilizing timers, interrupts, UART, I2C, SPI, and ADC modules.
- Applied bitwise operations and masking techniques to configure memory-mapped registers and manage low-power embedded peripherals.
- Designed and implemented hands-on projects including LED control, LCD interfacing, digital I/O, and communication protocols without an operating system.

Network Protocol Analysis with Wireshark

June 2024 – July 2024

- Conducted hands-on packet-level analysis using Wireshark to explore HTTP behavior, Ethernet framing, and link-layer protocol structures.
- Analyzed HTTP GET and response interactions, conditional GET requests, large HTML retrievals, authentication headers, and embedded object handling through live capture and trace file inspection.
- Investigated Ethernet frame structure, broadcast/multicast packet behavior, and ICMP traffic by capturing and interpreting raw packet data across network layers.

Big Data and Malware Detection Project

February 2024 – May 2024

- Conducted a collaborative literature review on malware detection strategies for Big Data environments, focusing on large-scale data processing challenges.
- Researched and categorized detection techniques, including AI-based models, deep learning, and data mining approaches.
- Evaluated the scalability, accuracy, and limitations of malware detection methods across various datasets and architectures.

FPGA Digital Systems Labs – Basys 3 (Artix-7)

January 2023 – April 2023

- Designed and simulated digital logic circuits using Verilog in Xilinx Vivado, implementing components such as multiplexers, adders, flip-flops, and shift registers.
- Gained hands-on experience with FPGA workflows through lab-based experiments covering RAM, combinational/sequential logic, and modular design.
- Demonstrated functionality on the BASYS 3 FPGA board, verifying timing and behavior through simulation and hardware testing.

Computer Architecture Cache Simulator

February 2024 – March 2024

- Developed a configurable cache simulator in Python to model memory performance under various cache sizes, associativity levels, and replacement policies.
- Parsed trace files to analyze memory access patterns and computed hit/miss rates to evaluate system-level efficiency.
- Gained hands-on experience with CPU architecture concepts, memory hierarchy design, and performance benchmarking on a Linux environment.

Leadership Experience

Hardware Project Co-Lead – Women in Electrical and Computer Science (WEECS)

January 2025 – Present

- Co-led planning, coordination, and execution of hands-on hardware projects, managing task assignments and project timelines.
- Guided members through circuit design, Arduino programming, and troubleshooting for projects including sound sensors and LED matrix displays.
  (Add 5+ project or 20+members)

Corresponding Secretary – Tau Beta Pi Engineering Honors Society

May 2023 – May 2024

- Managed the organization's database, maintained student records, and submitted eligibility reports for membership tracking and compliance.
- Coordinated initiation processes by reviewing candidate eligibility, conducting interviews, and organizing event logistics.
- Supported official communications and documentation to ensure smooth operations and member engagement throughout the academic year.

Student Assistant – CECS Academic Affairs Office

June 2023 – October 2023

- Provided front-desk support by advising an average of 25 students daily on course registration, academic policies, and walk-in advising logistics.
- Facilitated appointment scheduling, answered telephones and emails, and addressed student concerns with professionalism and efficiency.
- Assisted with student data management using Microsoft Office tools and contributed to ongoing

administrative projects to support academic operations.

Organizations and Achievements:
- **Bright Futures Scholar**
- **Associate of Arts (A.A.) Degree**, Alagappa University, 2021
  Concentration in Bharatanatyam (Classical Indian Dance)
- **Dean's List**, 2022–2025
- **Campus Involvement**: ACM, IEEE, Society of Women Engineers (SWE), Tau Beta Pi (TBP), Women in Electrical and Computer Science (WEECS), Indian Student Association (ISA)