EDWARD E SERNA

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OBJECTIVE

Computer Engineering graduate with hands-on experience in machine learning, embedded systems development, and full-stack web applications. Passionate about applying deep learning techniques to automated decision support systems and developing intelligent solutions that integrate software and hardware.

EDUCATION

University of Texas at San Antonio, San Antonio, TX

Bachelor of Science in Computer Engineering **| Graduation: December 2025**

Relevant Coursework: Machine Learning, Microcomputer Systems, Digital Signal Processing, VLSI Design, Embedded Systems

TECHNICAL SKILLS

Programming Languages: Python, C/C++, JavaScript, Verilog HDL

Web Development: React.js, Next.js, Node.js, HTML/CSS, MongoDB (NoSQL)

Embedded Systems: ESP32, MSP430FR5994, FRDM-KL25Z, PIC16F1829, MAVLink protocols

Development Tools: Git, Linux/WSL, Visual Studio Code, CLion, MPLAB X, SolidWorks (CAD)

RELEVANT PROJECTS

Deep Neural Network Implementation on MSP430FR5994 | *Embedded ML* | September 2024

- Implemented complete 784-32-10 deep neural network from scratch in C for handwritten digit recognition on resource-constrained microcontroller
- Achieved 93% accuracy on MNIST dataset through optimized forward propagation and activation functions
- Developed custom matrix multiplication algorithms and sigmoid activation optimized for embedded systems

PlanterBox: Automated Hydroponic Monitoring System | *Full-Stack IoT* | May 2024 - Present

- Built full-stack automated plant care system integrating ESP32 microcontrollers with Next.js web application and MongoDB NoSQL database
- Implemented real-time sensor monitoring (pH, PPM, temperature, humidity) with automated dosing pump control
- Deployed cloud-connected web interface on Vercel for remote monitoring and data visualization

ModiFly Drone Control Platform | *Autonomous Systems* | June 2022 - Present

- Developed modular C++ drone control software using MAVLink protocols for autonomous flight research
- Integrated ImGui, SDL, and OpenGL for real-time visualization and controller node management
- Managed complex CMake build systems with multiple third-party dependencies and service container architectures

Autonomous Cup Car with Vision Control | *Embedded Control Systems* | May 2025

- Designed PID controller system for FRDM-KL25Z board achieving fastest track time in class competition
- Implemented line camera vision system with autonomous navigation algorithms for real-time path tracking

PROFESSIONAL EXPERIENCE

Research Assistant, Unmanned Systems Lab - ModiFly Team

University of Texas at San Antonio | June 2022 - Present

- Developed modular drone systems integrating ArduPilot and MAVLink for autonomous flight research and testing
- Collaborated with research team to design and implement software solutions for UAV control systems]
- Utilized CAD software (SolidWorks) to design and 3D print custom drone components

CERTIFICATIONS & AWARDS

- 1st Place - Microcomputer Systems II Project (Cup Car & Tilt Table, May 2025)
- 3rd Place - Microcomputer Systems I Project (Music Glove, May 2023)
- UTSA Honor Roll (June 2022)
- CompTIA A+ | CompTIA IT Fundamentals | Microsoft Technician Associate