

Andrew Congdon

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Portfolio Website – andrew-congdon.com

EDUCATION

University of Notre Dame | Notre Dame, IN

May 2026

Bachelor of Science in Computer Engineering

GPA: 3.9 (Dean's List)

TECHNICAL SKILLS

Electrical & Embedded Systems: Circuit Design, Embedded C/C#/C++/Python, Arduino, Raspberry Pi

Control Systems & Protocols: Rockwell Studio5000, RSLogix5000, Siemens TIA Portal, Beckhoff TwinCAT, Ladder Logic (IEC 61131-3), Structured Text, HMI Design, Functional Safety (IEC 61508, ISO 13849), Ethernet/IP, DeviceNet

Software & Simulation: Unity, Unreal Engine, AI, Machine Learning, Computer Vision, Fusion 360, SolidWorks

EXPERIENCE

General Motors | Arlington, TX

June 2025 – Present

Controls Engineer Intern

- Designed and implemented RSLogix5000 ladder logic to retrofit a DeviceNet-based FANUC robotic cooling system, reducing compressed air use by 90% while preserving thermal focus integrity of vehicle night vision camera alignment
- Integrated Siemens RFID antenna system using TIA Portal and Ethernet/IP; developed PLC logic for reading and writing RFID tags, mapped carrier IDs, and designed operator HMI to support automated rerouting and data analysis

Starship Technologies | University of Notre Dame

Jan 2025 – Present

Robot Technician

- Performs preventative and reactive maintenance on 30 autonomous delivery robots, diagnosing and repairing motors, sensors, batteries, and navigation systems while supporting software updates and system-level troubleshooting
- Logs repair data, manages inventory, and assists with client-facing field rescues and operational support across campus

Universal Creative | Orlando, FL

May 2024 – Aug 2024

Ride/Show Controls Engineer Intern – Universal Epic Universe

- Ran and wrote over 300 control system factory and site acceptance tests for animatronics and show action equipment
- Redesigned electric circuit to decrease latency of Siemens-controlled ride vehicle actuators with relays and Beckhoff IPC
- Collaborated with software integration vendor to update Beckhoff TwinCAT software/motor firmware on animatronics

PROJECTS

Ride Engineering Competition | Columbus, OH

Jan 2025 – April 2025

Lead Controls Engineer

- Designed PLC-style control system with IEC 61131-3 ladder logic on an Arduino; built dual-layer E-STOP logic, stepper motor control, operator panel input, and 100+ FAT/SAT tests; placing 1st in control system design among 20 schools
- Integrated MOSFET gating, jogging/homing logic, and fault recovery with ASTM F2291-compliant safety interlocks
- Led all electrical wiring, GPIO mapping, and C++ Arduino extension file development for real-time ride automation

Computer Vision Interactive Wand | Waterloo, IA

March 2025 – May 2025

Personal Project

- Built a real-time spellcasting experience using OpenCV, scikit-learn, and a Raspberry Pi 5 to track infrared-lit wand movement and classify gestures with 99% accuracy using a custom SVM model trained on 400+ air-drawn samples
- Synchronized servo movement, LED effects, and spell-specific audio in a multithreaded show control pipeline

Autonomous Ride Vehicle Model | University of Notre Dame

Aug 2024 – Dec 2024

Droid Building Course Project

- Programmed an Arduino-driven Star Tours ride vehicle with synchronized motor control, MP3 audio, LED effects, servo animation, and TFT visuals across three 90-second themed show sequences with precise timing
- Integrated PS3 controller, color-sensor navigation, and a fully themed 3D-printed chassis with multi-layer shell design

LEADERSHIP/AFFILIATIONS

Themed Entertainment Association – President | **ASTM F24** – Member | **IAAPA** – Member | **IEEE-HKN** – Member