Matthew Jacobs

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Education

The University of Tennessee, Knoxville — Knoxville, TN
Bachelor of Science in Computer Engineering; GPA: 3.92/4.00 — *May 2026*

Experience

Sentinel Devices — Atlanta, GA
Software Engineer/Application Engineer — *Feb 2024 – Present*

- Built the complete frontend platform from scratch using React and TypeScript, creating the primary user interface for an IoT-based PLC anomaly detection system serving industrial clients
- Architected and developed machine learning models for real-time anomaly detection on embedded devices, enabling fully local processing without cloud dependencies for enhanced security and reliability
- Engineered robust backend infrastructure and comprehensive networking solutions including REST APIs, database systems, Docker/Balena containerization, nginx configuration, and automated deployment processes to ensure reliable data collection and device management across distributed IoT fleets
- Developed a custom Modbus protocol simulator for use in client presentations and technical demos to showcase product capabilities and support sales initiatives
- Conducted extensive data analysis on industrial PLC datasets to optimize machine learning model training and performance, directly improving anomaly detection accuracy

EPIC Lab UTK — Knoxville, TN
Undergraduate Researcher — *Sep 2023 – Feb 2024*

- Developed microcontroller-based sensing systems using Arduino IDE to control impedance measurement components for advanced materials characterization and self-sensing asphalt research
- Implemented machine learning algorithms on analog sensor datasets and created comprehensive data visualizations of electrical current flow patterns through cement-based materials
- Designed and fabricated complete electronic circuits through precision soldering techniques, ensuring reliable signal transmission and data acquisition across interconnected sensor networks

Oak Ridge National Laboratory — Oak Ridge, TN
Power Systems Engineering Intern — *May 2023 – Jul 2023*

- Systematically analyzed and documented over 600 critical electrical components across nuclear facilities, establishing comprehensive asset management protocols and ensuring regulatory compliance
- Leveraged ETAP and AutoCAD software to model and categorize complex electrical systems in three major national nuclear facilities, and delivered technical presentations showcasing power systems analysis findings

Projects

Inkstruct | *Computer Vision, Python, Machine Learning, Graph Theory* — June 2025

- Developed a machine learning pipeline that processes uploaded images through edge detection analysis and decomposes them into individual drawing strokes for step-by-step drawing instruction
- Implemented deep learning models including DexiNed for edge detection and SAM (Segment Anything Model) for object detection to create accurate image segmentation
- Applied graph theory algorithms to intelligently break down detected edges into component strokes, generating human-like sequential drawing guides that replicate the original image structure

Aro Project | *UI/UX Design, Stakeholder Management, Presentation* — Jan 2025 – May 2025

- Collaborated with a diverse, multidisciplinary team of business and engineering students to redesign the complete user interface for a digital wellness startup focused on reducing phone dependency
- Applied design thinking methodologies and conducted customer empathy interviews to identify user pain points, leading to the proposal of new product features and an innovative marketing strategy
- Organized and delivered multiple stakeholder presentations and facilitated regular meetings with company leadership to communicate design concepts and gather feedback throughout the development process

Technical Skills

Programming Languages: C++, C, Python, MATLAB, Bash, JavaScript, TypeScript, HTML, CSS, SQL
Tools & Technologies: Docker, Balena, nginx, Git/GitHub, Modbus Protocol, IoT Systems, Machine Learning
OS/Software: Linux, Windows, Microsoft Office Suite, VS Code, LT Spice, Arduino IDE, Data Visualization