Johnathan Uptegraph

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Summary:

Robotics engineer with 2+ years deploying 50+ robots across $25M+ automation projects for major EV automotive manufacturers, defense contractors, and medical device companies, now transitioning from industrial automation into humanoid robotics. Creator of C.O.R.I. (Cooperative Organizational Robotic Intelligence), a ROS 2-based home assistant robot featuring Gazebo simulation, 30 FPS computer vision, ESP32 hardware control, and adaptive behavioral learning to explore meaningful human-robot collaboration. With proven deployment experience and expertise in mechatronics and control systems, I focus on building robots that don't just automate tasks, but interact in ways that feel authentic, creating systems that can adapt, and interact with people in meaningful ways. I am driven by both engineering precision and creative vision, and thrive in environments where robotics is treated as both a science and an art. I am excited and eager to contribute to the next generation of robotics in a truly meaningful way.

Core Competencies:

Humanoid & Adaptive Systems - ROS 2 · Gazebo · HRI · Adaptive Interfaces · Behavioral Learning
Computer Vision & Perception - OpenCV · Color Classification · HSV Filtering · Sensor Fusion
Simulation & Modeling - Gazebo · RViz2 · URDF Development · Unity · Unreal Engine · Blender · Maya
Embedded & Hardware Integration - ESP32 · Raspberry Pi · Arduino · IMUs · GPIO · 3D Printing
Programming & Frameworks - Python · C++ · JavaScript · React.js · Linux (Ubuntu) · Git
Industrial Robot Platforms KUKA · Fanuc · ABB · Yaskawa · RoboGuide · KRL · Multi-Robot Coordination
Advanced Control Systems - Path Planning · Safety IO · Real-time Controls · PLC Integration

Humanoid Project:

CORI (Cooperative Organizational Robotic Intelligence) | June 2025 - Current
"I want AI to do my laundry so I have more time to do my art and writing, not the other way around."
CORI is a ROS 2-based home assistant robot developed to automate tasks while building context through behavioral feedback. While CORI is still in progress with 8 major updates in just a few months, my vision for CORI grows, as I believe, ***"We don't need simply smarter assistants. We need better teammates."***

Technical Architecture:

- Modular ROS 2 framework with 6 cleanly separated packages
- Real-time computer vision: 30 FPS color recognition & HSV classification
- Gazebo simulation: Mobile base URDF, RGB camera, RViz2 visualization
- ESP32 hardware bridge: Servo systems with serial communication
- Web-based interface: WebSocket-driven execution with real-time feedback
- Security layer: Nginx reverse proxy with authentication for safe deployment and wireless control
- Memory-based adaptation: Learns nuanced rules ("blue shirt with white trim = separate wash")

Future Roadmap: Navigation & SLAM, bipedal locomotion, dexterous manipulation, and behavior trees

Additional Projects:

Smart Home Ecosystem | May 2024 - Jun 2024
Developed a HomeKit Garage Door Controller using an ESP32, fully integrated with Apple HomeKit and CarPlay, housed in a custom 3D-printed enclosure.

3D Printing Mobile App | Jan 2022 - Aug 2022
Created an OctoPrint Mobile App using Swift for the interface and jQuery for the backend, enabling seamless remote management, printer control, print queuing, and safety protocols over the network.

Assistive Robotics - Cerebral Palsy SmartCup | Jan 2021 - Aug 2022
Designed robotic drinking-assistance cup for individuals with Cerebral Palsy using multi-modal IMU sensor fusion, with safety-critical food-grade electrical components, and prototyped several 3D-printed enclosures. Conducted thorough user testing with the University's Speech and Pathology Department.

Professional Experience:

Robotic & Controls Engineer at KC Robotics | May 2023 - Present

- **Major EV Automotive** - $20M+ install of 25+ KUKA robots; optimized motion & PLC logic resulting in 20% tool wear reduction. Built safety protocols for multi-robot coordination.
- **Medical Device Assembly**- Deployed 2 KUKA robots with 9+ end-effectors for MRI welding; redesigned PLC with Modbus monitoring for precision-critical safety systems.
- **Automate 2025 Demo Cell** - Programmed ABB, KUKA, Fanuc robots in coordinated pick-and-place demo using multi-robot handshaking protocols.
- **Defense Supplier (In Progress)** - Deploying 15+ Fanuc robots for autonomous inspection with optimized RoboGuide paths & Studio 5000 decision-making systems.

Academic Experience:

Machine Learning Research Assistant at Miami University | Aug 2022 - Oct 2022
Developed several tools using Python & Pandas to parse and extract language patterns from large data sets, went on to be acknowledged in "***Social Network Analysis and Mining"*** for our team's research.

Robotics, HRI, & Software Development Teaching Assistant at Miami University | Aug 2022 - Dec 2022
Taught Human-Robot Interaction, iOS, and Web Development courses. 70+ students with 97% pass rate.

Education & Certifications:

Major: Bachelor's in Emerging Technology with minors in Computer Science & Simulations
Awards: 4x Dean's List Recipient · Department Excellence Award · National Academy of Engineering
Certifications: FANUC Handling Tool Operations & Programming (2024) · EPLAN Electric P8 (2024)