Johnathan Uptegraph

Robotics & Mechatronics Engineer

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Summary:

Robotics engineer with 2+ years deploying 50+ robots across $25M+ automation projects for major EV manufacturers, defense contractors, and medical device companies. Currently transitioning from industrial automation to humanoid robotics through development of CORI, a ROS 2-based home assistant robot combining computer vision, adaptive learning, and human-robot collaboration. Proven expertise in mechatronics, control systems, and multi-robot coordination with a focus on creating authentic, adaptive robotic interactions.

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

Key Projects:

CORI (Cooperative Organizational Robotic Intelligence) | Jun 2025 - Current
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."***

- Modular ROS 2 framework: includes 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
- Memory-based adaptation: Learn from previous experiences to improve future decisions
- Roadmap for the future: SLAM, bipedal locomotion, gripper manipulation, and behavior trees

Smart Home Garage Switch| May 2024 - Jun 2024
Developed a Garage Door servo controller using an ESP32, in a 3D-printed enclosure. Includes simple HomeKit setup and custom Apple Carplay integration

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3D Printing Mobile App | Aug 2022 - December 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.

Cerebral Palsy Smart Cup | 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:

Robotics & 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 Contractor (In Progress)** - Deploying 15+ Fanuc robots for autonomous part inspection with optimized RoboGuide paths & Studio 5000 for molten material handling.

Academic Experience:

Machine Learning Research Assistant at Miami University | Aug 2022 - Oct 2022
Developed Python and Pandas-based tools for parsing and extracting language patterns from large datasets. Research contributions acknowledged in **"Social Network Analysis and Mining"** publication.

Robotics, HRI, & Software Development Teaching Assistant at Miami University | Aug 2022 - Dec 2022
Instructed Human-Robot Interaction, iOS, and Web Development courses serving 70+ students with 97% pass rate. Mentored students in practical robotics applications and software engineering principles.

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)

Note: *Letters of recommendation can be made available upon request.*