Johnathan Uptegraph

Robotics & Mechatronics Engineer

"I build systems that thrive under pressure—and scale with purpose."

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SUMMARY

I see robotics as both a science and an art—where engineering meets creative problem-solving. I think like an engineer and develop like a designer, creating systems that perform under pressure and scale with purpose. With over two years of experience deploying 50+ robots across $25M+ installations in EV, medical, and defense sectors, I specialize in solutions that launch fast, scale efficiently, and adapt to real-world constraints. **Now, I'm channeling that expertise into robotics R&D, mechatronics, rapid prototyping, and complex system design for humanoid and assistive robots.** I'm developing CORI (Co-Operative Organizational Robotic Intelligence), a home-assistant robot for laundry sorting and household tasks using ROS2 & Gazebo. I'm also writing Software Patch, a personal resilience narrative that uses the language and logic of computing to articulate and process the intricacies of human experience, offering a personal perspective on growth, overcoming adversity, and finding meaning in a complex world. Let's build something truly remarkable together!

CORE SKILLS

- **Robotics & Control:** ROS 2, Gazebo, KUKA, ABB, Fanuc, Yaskawa, KRL, EKF, Path Planning
- **Embedded & Prototyping:** ESP32, Raspberry Pi, Arduino, IMUs, GPIO, 3D Printing, Soldering
- **Programming Languages:** Python, C++, C#, Java, JavaScript
- **UX & HRI:** Human-Robot Interaction, HMI Design, Adaptive Interfaces, Sensor Fusion
- **Software & DevOps:** Linux (Kali/Ubuntu), Git, Rockwell Studio 5000, Modbus, React.js, Angular.js
- **Simulation & Design:** Fusion 360, Gazebo, RobotStudio, Unity, Blender, Unreal Engine

PROFESSIONAL EXPERIENCE

Robotic & Controls Engineer | KC Robotics

May 2023 - Current

- **Major EV Automotive Manufacturer – Material Handling & Grinding:** 1 of 4 electrical engineers responsible for a $20M+ install of 25+ KUKA robots. Developed PLC logic and taught robot paths.
- **Medical Device Manufacturer – Welding & Handling:** 2 KUKA robots with 9+ custom EOATs for MRI welding. Reverse engineered undocumented logic and active monitoring via Modbus.
- **Automate 2025 Demo Cell - Pick & Place:** Built a robotic demo (ABB, KUKA, Fanuc) with handshaking logic for dynamic material handling of colored objects to form image patterns.
- **Defense Contractor (Active-Development) - Material Inspection:** Integrating 15+ Fanuc robots for part inspection and handling. Optimizing RoboGuide paths, safety IO, and Studio 5000 logic.
- **Major Manufacturer (Active-Development) – Robot Retool:** Developing new EOAT, drawer locator system, AB PLC/HMI, full safety upgrade, EPLAN drawings, and electrical cabinet wiring.

PROJECTS

- **CORI - Co-Operative Organizational Robotic Intelligence (Active-Development)**
  A humanoid ROS 2 home assistant for task automation and Human-Robot Interaction (HRI) in home environments. This project includes an articulated URDF + xacro-based robot model, real-time state estimation via an Extended Kalman Filter integrating IMU and LiDAR data, and a built Finite State Machine (FSM) for task sequencing and navigation within a Gazebo simulation.
- **ESP32 Enabled CarPlay Smart Home Garage Door Switch**
  Engineered an ESP32-based smart garage door controller with seamless Apple HomeKit and Apple CarPlay integration, featuring a custom-designed and 3D-printed enclosure.
- **Swift UI 3D Printing Mobile App**
  Swift iOS app with OctoPrint integration and a jQuery backend for full 3D printer control.

ACADEMIC & LEADERSHIP EXPERIENCE

University Machine Learning Research Assistant | Aug 2022 – Oct 2022

- Engineered adaptive robotic drinking device for individuals with Cerebral Palsy
- Controlled liquid flow rate using IMU, 3D-printed housing, and food-grade safe components

Lead Robotics Researcher for Cerebral Palsy Robotic Drinking Device | Jan 2021 – Aug 2022

- Engineered an adaptive robotic drinking device tailored for individuals with Cerebral Palsy, controlling liquid flow rate using IMU, 3D-printed housing, and food-grade safe components.

Teaching Assistant for Human Robot Interaction, Web, and Mobile App Dev | Aug 2022 – Dec 2022

- Mentored 70+ students across coursework, supplemental instruction, and exam review
- Achieved 97.14% pass rate through clear communication with university faculty and staff

EDUCATION

Bachelors in Emerging Technology with Minors in Computer Science & Simulations
4x Miami University Dean's List Recipient & Department's Academic Excellence Award

CERTIFICATIONS

- FANUC Handling Tool Operations & Programming *(Issued May 2024)*

CREATIVE TECHNICAL WRITING

- **Author of *Software Patch*** – Creative narrative fusing robotic metaphors with personal resilience and control theory, bridging technical and emotional fluency for human-centered engineers.