

Hersch Nathan

They/Them/Theirs | Hersch.Nathan@uky.edu | 317-272-4525
herschnathan.com | linkedin.com/in/hersch-nathan | github.com/Hersch-Nathan

A roboticist and puppeteer fascinated with how humans interact with motion

SKILLS

Embedded Systems: C/C++, Assembly (ARM), FreeRTOS, ESP32 IDF
Robotics and Controls: ROS (Gazebo), LabVIEW
Electronics Design & Test: Soldering (through-hole, SMT), Electronic Equipment (Oscilloscope, Logic Analyzer, Power Supplies)
Machine Learning & Data Analysis: Python (PyTorch, OpenCV), MATLAB (Signal Processing, Communications), R
CAD & PCB Design: KiCAD, Altium Designer, Fusion360, Onshape
Show Programming: ShowForge, QLab, ETC EOS
Amateur Radio: Technician License (Call sign KD9POY - Completed June 2020)

PUBLICATIONS AND PRESENTATIONS

PAPERS:

Details: herschnathan.com/research

M. Fontaine, A. Garsha, H. Nathan, R. Schloen, J. Ruiz, B. Boardman, "Robotic Integrated Mobile Systems for Material Inspection and Handling," Waste Management Symp, 2025 (herschnathan.com/wmsym25)

CONFERENCE PRESENTATIONS:

M. Fontaine, A. Garsha, H. Nathan, R. Schloen, J. Ruiz, B. Boardman, "Robotic Integrated Mobile Systems for Material Inspection and Handling," Waste Management Symp, 2025 (herschnathan.com/wmsym25)

H. Nathan, D. Lisowski, S. Beckwith, "Robotics and Automation On and Off the Stage," 65th Annu. United States Institute for Theatre Technology Conf. and Stage Expo, 2025 (herschnathan.com/usitt25)

H. Nathan, M. Bergmann, J. Vercosa, "Robotics, AI, and the Future of Theatre," 64th Annu. United States Institute for Theatre Technology Conf. and Stage Expo, 2024 (herschnathan.com/usitt24)

EDUCATION

University of Kentucky

Expected Graduation: May 2026

Bachelor of Science in Electrical Engineering, Bachelor of Arts in Theatre

GPA: 3.78

Relevant Coursework: Signals and Systems, Robotics, Embedded Systems, Electronics, Scenic Design, Stage Management

PROFESSIONAL EXPERIENCE

Robotics & Electrical Intern | E-3 & A-3 | Los Alamos National Laboratory

May 2025-Present

- Continued development of mobile robot demonstration, optimizing AI/ML workflow for inspection tasks
- Designed and Executed electrical test and characterization of a high-powered pulsed power circuit
- Constructed custom LabVIEW VIs within a standardized framework

Mechatronics Intern | Advanced Technology Interactives/R&D | Universal Creative

Jan 2025-Apr 2025

- Executed show programming (ShowForge) of a system in the intersection of robotics, puppetry, and animatronics
- Designed prototype electronics using KiCAD and developed instrumentation software for hardware testing
- Assisted in Site Acceptance Testing (SAT) and documentation review for a robotic show platform

Robotics & Automation Intern | E-3 | Los Alamos National Laboratory

May 2024-Aug 2024

- Integrated ClearPath Ridgeback mobile robot with UR5 by modifying the power system and integrating safety systems
- Developed a computer vision system using AI/ML using Intel Real Sense Cameras, deploying and configuring a ROS network
- Devised and debugged LabVIEW VIs for control and data acquisition systems of sensors

RESEARCH EXPERIENCE

Undergraduate Researcher | Electrical and Computer Engineering | University of Kentucky

Sept 2024-Jan 2025

- Collaborated and lead the firmware team working on a small reentry capsule testing Thermal Protection Systems
- Architected firmware for ESP32 using a real time operating system (FreeRTOS) utilizing C/C++
- Adapted and ported drivers for sensors to work with ESP32 and FreeRTOS over I2C and SPI

Undergrad Research Fellow | Electrical and Computer Engineering | University of Kentucky

Jan 2023-May 2024

- Developed trajectory planning algorithms using AI & traditional algorithms to optimize trajectories to improve safety of robots
- Used Python and MATLAB to design and build a simulator to test and validate its performance in diverse scenarios
- Conducted comprehensive literature reviews to identify research gaps and inform the development of algorithms

NSF-REU Undergraduate Researcher | University of Maryland Baltimore County

June 2023- Aug 2023

- Demonstrated the feasibility of LoRa for transmitting large data (images) for robotic navigation
- Deployed and benchmarked Modal AI Sentinel (UAV) within an asynchronous heterogeneous network

EXTRACURRICULAR EXPERIENCE

Project Manager of Active Control Research | SpaceLex (Student Organization)

Sept 2022-May 2024

- Managed an 8-10 member interdisciplinary team to design & build a rocket, securing over \$30,000 in funding
- Contributed to electronic design layout and embedded programming, demonstrating expertise control systems

PROFESSIONAL INVOLVEMENT

United States Institute for Theatre Technology (USITT), Engineering Commission

2024-Present

IEEE Robotics and Automation Society (RAS), Member

2025-Present

IEEE - Eta Kappa Nu (HKN), Member

2023-Present

Puppeteers of America (POA), Puppeteer/Member

2017-Present