Conor Wood Hayes

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Summary

Hands-on robotics and embedded systems engineer with extensive experience building & deploying real-world hardware, autonomy stacks, and mission-critical embedded systems end-to-end. Strong focus on field testing & reliability in harsh environments.

Skills

Manipulation: ROS2, inverse/forward kinematics & dynamics, path planning, control theory, foundation models (VLA/VLM)
Perception: computer vision, SLAM, state estimation, kalman filters, particle filters, IMUs, GPS, RGB-D camera
Firmware/Hardware: microcontroller development, protocol design (wired, memory, BLE), PCB design, PCB bring-up & debug
SWE/ML/AI: OpenCV, NumPy, Pandas, Matplotlib, pytorch, SciPy, scikit-learn, linux, git, Docker, AWS, API design
Languages: Python, C, C++, CMake, Makefile, Bash/Zsh, Rust, SQL, TypeScript, Verilog, assembly, linker scripts

Education

Northwestern University – *M.S. Robotics — Perception, Manipulation, and Embodied AI* 2025–Aug 2026 (expected)

University of Southern California – *B.S. Computer Engineering & Computer Science* 2015-2019
Magna Cum Laude. Minor in Chinese for the Professions, Thematic Option (Honors in Liberal Arts)

Projects

Northwestern University | *PenPal — Franka Panda 7DoF Manipulation System* Nov-Dec 2025
- Developed perception -> planning -> control pipeline in ROS2 for real-time handwriting on arbitrarily-oriented moving surface.
- Implemented camera calibration, pose estimation, online trajectory generation, and closed-loop visual cartesian control.
- Tuned controllers, handled noise, delays, and system constraints to ensure consistent physical performance.

USC Rocket Propulsion Lab | *Traveler IV — First 100% undergrad-made rocket to fly to space* 2015-2019
- Built & led 30-person engineering team. Oversaw all software (C++), hardware (Altium), and EGSE for multiple iterations of custom avionics system, which successfully flew to, survived, and returned from space.
- Led analysis effort to determine flight path, published Traveler IV Whitepaper concluding the rocket crossed the Karman Line.
- Debugged electrical, software, and radio issues in the field under timing constraints, inclement weather, and poor infrastructure.

Work Experience

Conor Hayes Software Consulting (CHSC) | *Independent Consultant* 2023 - 2025, IN/NY/CA
- Built reusable hardware testing framework (Python) for two $500K high-speed test racks (SMU, PSU, PDU, Pickering simulators; CAN, USB, ethernet, GPIB, SCPI) for space & nuclear fusion projects, driving successful on-time delivery after 8mos.
- Redesigned BLE protocol (C, TypeScript) for NRF52-based wearable. +2 sensors, +800% bandwidth, -10% power consumption.
- Prototyped a low-latency peer-to-peer telepresence platform for controlling robots via web client (WebRTC, AWS, TypeScript)

Wesper, Inc | *Software Engineer (8th employee @ startup)* 2020 - 2022, New York City
- Owned firmware development (C, NRF5X) to support multiple hardware iterations of a sleep apnea diagnosis wearable, from late-stage prototypes to FDA-approved, mass-produced, revenue-generating product.
- Integrated new sensors, developed on-device algorithms, and expanded BLE interface to enable low-power real-time reporting of patient heart rate, blood oxygen level, and sleep posture.
- Led a team of 3 to build backend from scratch (AWS ECS, EC2, λ, S3, RDS MySQL, Python) to ingest and process all patient data.

Honeybee Robotics | *Software & Electrical Engineering Intern* May - Aug 2018, Pasadena, CA
- Worked directly with project teams of mechanical, electrical, and systems engineers to spec & implement new features in an internal ROS-like testing framework, with 200+ source files and 100,000+ lines of C++ code.
- Designed, tested, and validated PCB (Altium) to provide human-in-the-loop control of small drills on remote oil rigs.

NASA Jet Propulsion Laboratory | *Flight Electronics Intern (Group 349E)* Jan - Aug 2017, Pasadena, CA
- Developed still-in-use HW/SW test suite (C, Python, SPARC Assembly) for the first deep-space-capable cubesat C&DH board.
- Supported initial board bring-up, discovered critical bugs in novel rad-hardened NAND flash controller and other peripherals.

Awards + Hobbies

American Institute of Astronautics and Aeronautics | *Achievement Award* Oct 2019
National Academy of Engineering/USC | *Grand Challenges Scholar* May 2019
University of Southern California | *Renaissance Scholar (0.9% of graduating class)* May 2019

Recorded Music: Accumulated 700,000+ Spotify streams on original music under artist name *Wise John* (39 songs, 2 albums, 1 EP).
Live Music: Sold 170 tickets across bill at NYC's Mercury Lounge (2024). Performed 20+ live shows in NYC, LA, and elsewhere.