Connor McKelvey

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Education

The University of Texas at Austin — Austin, TX
B.S. Electrical and Computer Engineering; GPA: 3.85 — *Expected May 2029*
Computer Architecture & Embedded Systems Track; Inaugural Honors Robotics Cohort (1.5% acceptance); Robotics Minor

Human-Enabled Robotic Technology (HeRo) Lab Research Experience

Professor Ann Fey's Robotics Research Lab — Austin, TX
Texas Robotics, The University of Texas at Austin — *Fall 2025 – Present*

Vibrotactile Guidance Wristband | *Embedded Biometric Wearable for Rehabilitation & Teleoperation*
- Design a custom 4-layer mixed-signal PCB in KiCad with an ESP32-S3, IMU, and 16 bit ADC for EMG signals, implementing X-Y spatial separation and internal ground planes to shield sensitive microvolt-level biometrics from noise and 6 PWM-driven haptic motors
- Write C firmware for unit testing, implementing freeRTOS to handle data collection, networking, and motor driving tasks

Operating Room Cleaning Robot | *Imitation-Learned Robotic Manipulation for Autonomous Surgical Cleaning*
- Research diffusion and screw-axis-based motion training for complex environment cleaning in collaboration with colorectal surgeon Dr. Claire Sokas
- Migrate Python codebase for computer-vision-based data collection, training, and force-feedback replication to ROS2
- Develop point-cloud spill and surface detection algorithms, and force-feedback-capable end-effector firmware

Haplink Communication Protocol | *Embedded Communication Framework for Low-Latency Haptics*
- Publish to the official Arduino Library and distributed across UT Austin robotics education programs reaching 90+ Freshman Research Initiative and summer-camp participants
- Co-author of *"Longhorn Hapkit and Haplink: An Open-Source, Reconfigurable, 2-DOF Haptic Device and Communication Protocol for Robotics Education"* with Prof. Ross Neuman for submission to *IEEE Robotics and Automation Practice*
- Engineer a type-safe 13-byte serial protocol that achieved 100% delivery across 500 isolated transactions, with only 0.03% overhead compared with a custom binary serial implementation

Leadership Experience

IEEE Projects Director — Austin, TX
IEEE Student Branch, Executive Board — *Fall 2025 – Present*
- Elected to the executive board as a sophomore after advancing directly from Assistant External Events Officer
- Oversee technical programming, including Techathon, UT Austin's premier hardware hackathon; the IEEE Region 5 circuit design team; long-term engineering projects; and hands-on workshop series
- Planned and executed cross organizational events supporting community engagement for IEEE's 300+ active members

Robotics Honors Mentor — Austin, TX
Texas Robotics, The University of Texas at Austin — *2026 – Present*
- Selected for an first-of-its-kind 60 student cohort from 3,600 applicants, entrusted to mentor a group of first-year students, and launching an organization supporting student technical projects and community

Eagle Scout — Tomball, TX
Scouting America — *Jan. 2018 – Dec. 2024*
- Earned 6 consecutive promotions to become 1 of 4 Houston-area Senior Patrol Leaders for Scouting's National Youth Leadership Training course, the highest youth leadership position; led and mentored staff serving 400+ participants

Technical Projects

SkyLore | *Best Celestial-Themed Project at HackTX 2025, Freetail Hackers* — *Fall 2025*
- Won Best Celestial-Themed Project and $1,000 at HackTX 2025 among 1,000 participants representing 50+ schools
- Conceived and built the project's core innovation: leveraging app user data to create a living observation database and light-pollution map providing actionable data for city planners, researchers, and developers

Embedded Shadowboxing Game | *Winning final project for Embedded Systems Honors Class* — *Spring 2026*
- Placed 2nd in the Honors final project competition out of 40 teams
- Developed C firmware for an ARM Cortex-M0+ shadowboxing game, implementing a finite-state machine, analog accelerometer inputs through the ADC for punch direction, and hardware interrupt based sound/graphics

2-DOF Vector Art Drawing Robot | *Research Platform for Professor Dempster's Being Creative class* — *Fall 2025*
- Built a custom 2-degree-of-freedom robot arm capable of drawing vector images; standardized research stimuli using inverse kinematics, buffered serial hardware control, and a web simulation

Technical Skills

Programming/Software: ROS 2, Python, C, C++, Java, ARM Assembly, Git
Embedded/Hardware: ARM based Microcontrollers, PCB Design, UART, Analysis using logic analyzers and oscilloscopes
Relevant Coursework: Embedded Systems, Digital Logic Design, Introduction to Electrical Engineering, Software Implementation