

NIAMH COLES

Cedar Park, Texas 78613 | niamhcoles@gmail.com | 737-297-4478

EDUCATION

Texas A&M University *B.S. Multidisciplinary Engineering*

Aug 2023 – May 2027

GPA: 3.2 | *Austin Community College — TAMU Engineering Academy (Aug 2019 – May 2024), GPA: 3.54*

TECHNICAL SKILLS

CAD & Simulation: SolidWorks, Fusion 360, OnShape; FEA (linear & non-linear static), dynamic system modeling, Simulink, rapid prototyping

Electronics & PCB: Altium Designer & rigid/flex PCB design, custom sensor design & evaluation, soldering

Programming: C, C++, Python, Assembly, Arduino, Git, LaTeX

Controls & Robotics: PID & feedforward control, robotics control systems, tendon-driven actuation

Professional: Design of experiments (DOE), technical presentations, technical documentation, literature review, mentoring & teaching

RELEVANT EXPERIENCE

Undergraduate Researcher — *Faculty Research Lab, Texas A&M*

Jan 2025 – Present

- Independently designed and built a multimodal rigid/flex PCB in Altium Designer integrating temperature, humidity, acceleration, vertical force, and shear detection, driven by a Nordic nRF5340 (BLE) microcontroller module.
- Built a strong economical proof-of-concept shear-warning device using force-sensitive resistors (FSRs); initial results detect on-axis shear of ~5 N for as little as \$20 while measuring vertical force to within 1–2 N.
- Designed validation experiments generating Bland-Altman plots for the temperature and humidity sensors, and built Python tools to analyze data and produce figures of merit supporting design conclusions; work is being prepared for submission to an IEEE journal.

Research Experience for Undergraduates (REU) — *HAND ERC*

Jun 2025 – Aug 2025

- Built the actuation and control system for a backdrivable, n+1 underactuated, four-DOF tendon-driven robotic finger with a four-bar coupling on two flexion joints.
- Implemented PID and feedforward control across four DC motors with external magnetic encoders, using motor torques and Jacobians to drive the finger to commanded positions.
- Designed and fabricated motor mounts and wired/soldered the full electronics system; presented progress bi-weekly.

Student Worker — *MXET Program, Texas A&M*

Jun 2026 – Jul 2026

- Designed and taught four weeks of curriculum for the HAND ERC Research Experience for Teachers, guiding six high-school teachers in building a simplified five-DOF tendon-driven robotic hand.
- Covered CAD, C++/Arduino, basic circuits, 3D-printing design constraints, and tendon-driven robot design; every teacher independently designed, assembled, and programmed a working hand, most with little prior experience.

PROJECTS & LEADERSHIP

Dexterous Design Challenge (DDC) — **Co-Founder & Organizer** — *HAND ERC*

Jan 2026 – May 2026

- Co-founded and led an 8-week competition in which teams of six undergraduates built an 11-DOF robotic hand and wrist; drew 20 registered teams, 7 of which completed and presented their work. Designed the forearm and the required build kit.
- Organized informationals, kit distribution, check-ins, and communications, and helped plan and run the two-day final competition (graduate-student judges, high-school volunteers, evaluation testbeds, catering).
- Co-first author on a resulting paper accepted to an international IEEE conference (ICELIE 2026, Oct 18–21); contributed to technical work and manuscript writing.

Vice President & Technical Lead — *ASME-Tech, Texas A&M*

Aug 2025 – Present

- Lead the technical team; plan and run build events, workshops, and study sessions for groups of 10–60 peers.
- Manage two junior officers and delegate work to deliver events.

Articulate Mechanical Digit — *Personal Project*

2023 – 2024

- Designed a three-segment mechanical finger in SolidWorks, iterating until it functioned smoothly; integrated servos and an Arduino for programmable, automated motion.

RELEVANT COURSEWORK

Mechatronics I, Embedded Systems Software, Embedded Systems Development in C, Microcontroller Architecture, Analog Electronics, Electronic Instrumentation, Applied Dynamic Systems, Product Design & Solid Modeling, Digital Electronics, Circuit Analysis