Ian Lansdowne

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EDUCATION

University of Texas at Austin — Austin, Texas

Master of Science in Mechanical Engineering — *Present*

School of Engineering — *Cumulative GPA: -.–*

Texas A&M University — College Station, Texas

Bachelor of Science in Mechanical Engineering — *Dec 2025*

College of Engineering — *Cumulative GPA: 3.94*

Honors: Summa Cum Laude, Craig and Galen Brown Engineering Honors, J. Mike Walker '66 Impact Award, Michael Berman '82 Scholarship

Relevant Coursework: Mechanics of Robotic Manipulators, Dynamics and Modelling of Mechatronic Systems, Machine Learning

PUBLICATIONS

Hilburn, E., Pettinger, A., Wilkinson, E., **Lansdowne, I.**, Ambrose, R., (May 19, 2025). "Robotic Space Simulator: Controls Implementation for Auxiliary Axes and Zero-G Dynamics". In: *2025 IEEE International Conference on Robotics and Automation (ICRA)*. Atlanta, GA, USA: IEEE, pp. 14624–14630. DOI: 10.1109/ICRA55743.2025.11128455.

PRESENTATIONS

Lansdowne, I. (Apr. 3, 2026). "Dynamics of QUAD V2: A Low-Cost Quadrupedal Robot". Conference Poster. Texas Regional Robotics Symposium (TEROS). Arlington, Texas, USA.

Lansdowne, I., Bucknor-Smartt, Z., Dominguez, O., Foltyn, J., Guttman, M., Kannanganat, S., Kong, J., Parker, C., Silva, E., (Apr. 30, 2024). "TURTLE Quadruped Project (QUAD)". Conference Poster. Texas Regional Robotics Symposium (TEROS). College Station, Texas, USA.

RESEARCH EXPERIENCE

Robotics and Automation Design Laboratory (RAD) — Bryan, Texas

Technologist I: Robotic Space Simulator (RSS) — *Feb 2026 – Present*

- Supported development of a robotic simulator to model relative contact dynamics between satellites in microgravity, consisting of two robotic hexapods, each with a translational or revolute auxiliary axis.
- Implemented virtual fixturing for a UR20 robotic arm in ROS2 for a demonstration to SSTI stakeholders.

Undergraduate Researcher: Robotic Space Simulator (RSS) — *May 2024 – Aug 2024*

- Formulated methods to calculate mass properties and compensate for mass effects of a satellite attached to a force-torque sensor on a Stewart platform, published at ICRA 2025.
- Developed software including a workflow for ROS in Docker on Real-Time Linux/WSL to package & test robot code.
- Designed and 3D printed a compliant robotic arm mock-up to test dynamics without risking $60,000+ of hardware.

Undergraduate Researcher: RoboBall II — *May 2023 – Aug 2026*

- Developed a control system and firmware for a pendulum-driven inflatable ball robot to research the effects of internal pressure on surface traction, for use in exploring craters on the Moon.
- Wrote a ROS package and library for the ODrive Pro motor controller in C++

Texas A&M Robotics Team and Leadership Experience (TURTLE) — College Station, Texas

Project Lead: QUAD — *Jan 2023 – Dec 2025*

- Led a team of 10-15 undergraduate students in designing three iterations of a low cost quadrupedal robot.
- Derived inverse kinematics/dynamics and programmed quadrupedal robots with custom gait control in Python and C++.
- Presented a poster showcasing the quadrupedal robot designs for Texas Robotics Symposium (TEROS) 2024 and 2026.

Control and Robotics Laboratory (CtrlRobot) — College Station, Texas

Undergraduate Researcher — *Jan 2025 – Dec 2025*

- Directed a team of undergraduate researchers in designing several low-cost compliant tendon-driven robotic hand for manipulation of soft and heterogeneous objects.
- Developed and evaluated tendon routing, joint flexibility, and material selections to balance grasp strength with gentle interaction for agricultural robotics.

Nanorobotics, Energy Harvesting and Sensing Lab (NES) College Station, Texas

Undergraduate Researcher (Senior Capstone) *Jan 2025 – Dec 2025*

- Contributed *ComSole*, a smart insole integrating IMU sensing, haptic cuing, and onboard machine learning (ML) to detect and mitigate Freezing of Gait (FoG) in Parkinson's patients in real time.
- Fabricated 3D-printed TPU insoles optimized for comfort, durability, and robust sensor mounting.

INDUSTRY EXPERIENCE

S&K Engineering and Research/NASA Houston, Texas

Technical Intern *Mar 2023 – Present*

- Maintained and improved of NASA's FIRST Robotics grants website in PHP, MySQL, JavaScript to distribute grants to over 400 high school robotics teams spanning 3 seasons.
- Contributed to the design of the Robonauts Everybot, an accessible, low-cost FRC robot that impacted over 1,900 FIRST Robotics Competition teams and helped raise the competitive baseline across the league.

NASA Office of STEM Engagement, ER3 HumanWorks Lab Houston, Texas

Research Intern *Jun 2025 – Aug 2025*

- Optimized cable-driven gravity offload device design, improving simulation accuracy for Moon/Mars gravity training on NASA's reduced gravity simulator, ARGOS
- Analyzed motor characteristics and kinematic properties to inform device design optimizations.
- Built testbed to measure BLDC motor characteristics to select and validate a motor meeting design requirements.
- Modified ODrive S1 motor controller firmware and GUI to inplement a custom cable tension control loop.

Texas A&M University Department of Mechanical Engineering College Station, Texas

Student Ambassador *Feb 2025 – May 2025*

- Led facilities tours and represented the Mechanical Engineering Department to prospective and current students, explaining academic programs, lab spaces, and undergraduate opportunities.

NASA JSC Summer Robotics Academy Houston, Texas

Project Lead *Jun 2022 – Aug 2022*

- Guided a team of professional bomb technicians to design, build, and operate a fleet of rovers for bomb detection.
- Created a Wi-Fi HaLow mesh network to control rovers over half a mile away.

LEADERSHIP

Texas A&M University Robotics Team and Leadership Experience (TURTLE) College Station, Texas

President, Internal Vice President, Logistics Officer *May 2025 – Dec 2025*

- Scaled TURTLE Robotics by 300%+ into Texas A&M's largest robotics student organization with 330 members.
- Approved and funded 21 unique advanced robotics projects proposed by undergraduate students.
- Expanded outreach and development programs to teach robotics skills to underclassmen.
- Secured over $20,000 in organization funding through proposals to the department, college, and corporate sponsors.
- Constructed and supported a team of 40 officers to fulfill internal, external, developmental, and project-centric duties.
- Hosted a conference-style project showcase featuring all 21 TURTLE projects for Mechanical Engineering faculty, students, and campus partners.

FIRST Robotics Team 118 (Robonauts) Houston, Texas

Captain *2019 – 2022*

- Led and organized a team of 60 students to develop a world-class robot for the FIRST Robotics Competition.

SKILLS

Software: Proficient in Bash, C, C++, Java, JavaScript, MATLAB, PHP, Python (NumPy, SymPy, Pandas), SQL

Technical: Proficient with CAD (Solidworks, Creo, Fusion 360), Docker, Git, LaTeX, Linux, Machine Learning, ROS