Nathan Tsao

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EDUCATION

University of Illinois at Urbana-Champaign *Aug 2019 – May 2022*

- ***Bachelor of Science in Mechanical Engineering*** *Champaign, IL*
  - Cumulative GPA: 3.87
  - Five-time Dean's List recipient
  - Relevant Coursework: Robot Dynamics and Control, Solid Mechanics I *(graduate)*, Intermediate Dynamics, Mechanical Design, Introduction to Robotics, Signal Processing, Heat Transfer, Engineering Materials, Fluid Dynamics, Dynamics of Mechanical Systems, Electrical and Electronic Circuits, Thermodynamics.

EXPERIENCE

UIUC RoboDesign Lab *Jan 2022 – May 2022*

Undergraduate Research Assistant *Champaign, IL*

- Developed a force-sensing foot for humanoid robots using Hall sensors.
- Conducted polymer and sensor testing to predict foot performance under loads.
- Designed and fabricated 3D-printed prototype by soldering sensors and casting polymer.
- Tested calibration techniques using polynomial fit, gaussian process regression, and neural networks.

CLASS PROJECTS

Instrumented Foot for Humanoid Robot *Aug 2021 – Dec 2021*

- Led team to prototype a force-sensing foot for use on a humanoid robot.
- Simulated foot deformation and sensor outputs with MATLAB.
- Manufactured foot prototype with 3D-printed parts.

3-Speed Transmission Design *Jan 2021 – May 2021*

- Utilized two planetary gear sets and dog clutches to design a three-speed transmission.
- Completed FEA with Fusion 360 to meet factor of safety requirements.
- Simulated transmission in Solidworks.

Snack-Disposing Walker Mechanism *Aug 2020 – Dec 2020*

- Designed lightweight, durable, easy-to-assemble quadruped walker.
- Analyzed reaction forces and gait speed of leg mechanism to reach a walking speed of 100 mm/s.
- Judged as best design project by peers.

SKILLS

- Solidworks, MATLAB, Creo, Fusion 360, Octave, Simulink, Gazebo, Kotlin, Java, Python, LabVIEW, LaTeX.
- Fluent in English and Mandarin.