Yvonne Zhang

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Education

Johns Hopkins University Baltimore, MD
Master's of Science in Engineering in Robotics *June 2027*
Relevant Coursework: 530.691 Haptic Interface Design, 601.655 Computer-Integrated Surgery 1

University of Toronto Toronto, Canada
Bachelor's of Applied Science in Mechanical Engineering & PEY Co-op *June 2025*
Minors: Robotics & Mechatronics and Engineering Business

Project Experience

Visual Information through Sensory Tactile Array (VISTA) Maryland, MD
Johns Hopkins University *August 2025 – Present*

- Designed and fabricated a 7×5 tactile pin-array display with a silicone overlay to study the relationship of height-encoded haptic representations of shape and color.
- Developed a pipeline from image preprocessing to color-to-height-to-motor mapping, implementing control of 35 independently actuated pins using Arduino-based embedded systems.
- Conducted preliminary user demonstrations using national flag images, validating users' ability to distinguish shape and color cues and informing design tradeoffs for scalable, higher-resolution tactile displays.

Undergraduate Student Researcher Zurich, Switzerland
ETH Zurich - pd/z Product Development Group Zurich *June 2024 – September 2024*

- Designed and fabricated a custom end-effector mount integrating dual Intel RealSense cameras on a Franka Emika Panda arm to enable real-time depth sensing for hand interaction tracking.
- Developed ROS2-based perception pipelines for depth extraction and gesture recognition using MediaPipe and custom-trained keypoint classifiers for surgical assistance applications.
- Authored a foundational research paper establishing formalized protocols that enabled the successful progression of three preceding PDZ lab thesis projects.

Autonomous Rover Design Project Toronto, Canada
University of Toronto *September 2024 – December 2024*

- Designed an autonomous rover platform integrating Bluetooth motor control, ultrasonic sensing, and servo actuation to study navigation, reorientation, and obstacle detection behaviors.
- Implemented Python-based maze navigation algorithms and validated system behavior through simulation-based testing, achieving consistent full-task completion within 5-minute operation window.
- Designed a power distribution network using buck converters to supply stable 8 V and 5 V rails for motors and onboard electronics during continuous operation.

Window Cable Tensioner Redesign Project Toronto, Canada
Magna Internation & University of Toronto *September 2024 – December 2024*

- Redesigned a frameless car door cable tensioner mechanism under Magna mentorship, reducing component complexity and manufacturing cost in a purely mechanical design.
- Iterated SolidWorks CAD designs and conducted FEA to evaluate stress, fatigue, and wear, informing material selection and manufacturability of plastic extrusion components.

Work Experience

Systems Engineer Toronto, Canada
WSP Canada *May 2023 – May 2024*

- Authored a novel methodology for characterizing thermal properties of train fire spread using material testing data, informing CFD boundary conditions and adopted across three mass transportation projects, including the Calgary Green Line.
- Performed hydraulic modeling and dry fire line design in AFT Fathom 13 to ensure compliance with NFPA 130 and NFPA 14 volumetric flow and pressure constraints.

Technical Skills

Programming: Python, Arduino IDE, C, C++
Data Visualization: MATLAB, Excel, and Minitab
CAD/Design: SolidWorks, ANSYS Fluent & Mechanical, FIGMA