# Yvonne Zhang

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## Education

**Johns Hopkins University** Baltimore, MD
Master's of Science in Engineering in Robotics *August 2025 – 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 *September 2020 – 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.
- Established a foundational mechanical–software integration framework for defining sensor mounting geometry, kinematic reference frames, and modular system architecture.

**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 Internship** 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