

# Pijuan Yu

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[Github](#) | [Google Scholar](#)  
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My research interests are haptics and robotics. Current research focuses on developing remote haptic communication frameworks to render tactile sensations between nurse and doctor in Virtual/Mixed Reality.

## Education

08/2022 – Current	<b>PhD in Mechanical Engineering</b> , <i>Texas A&amp;M University</i> GPA: 4.00/4.00 Advisor: Rebecca Friesen
08/2020 – 12/2021	<b>MS in Mechanical Engineering</b> , <i>Northwestern University</i> GPA: 3.91/4.00 Advisor: Kevin Lynch, Matthew Elwin Minor in Engineering Management
08/2018 – 05/2020	<b>BS in Mechanical Engineering</b> , <i>Florida Institute of Technology</i> GPA: 3.51/4.00 Honor: Cum Laude
09/2016 – 06/2018	<b>BS in Energy and Power</b> , <i>Wuhan Institute of Technology</i>

## Work Experience

08/2022 – Current	<b>Graduate Research Assistant</b> , <i>Texas A&amp;M University, College Station, TX</i> <ul style="list-style-type: none"><li>Developed a robotic visuo-haptic platform for remote medical palpation; achieved 75% tumor diagnostic accuracy in 18 participants, proving passive haptic feedback alone sufficed for size perception (<i>Published</i>).</li><li>Engineered a wearable VR haptic glove with Unity-integrated force feedback; 40-subject study showed 25% tactile acuity gain via mimicking motions, validating proprioception's role in VR interaction (<i>in Progress</i>).</li><li>Develop low-cost, open-source soft haptic display toolkits (e.g., soft tactile displays) to democratize access to high-fidelity tactile interfaces (<i>Published</i>).</li></ul>
04/2022 – 08/2022	<b>Research Technician</b> , <i>The Feinberg School of Medicine, Chicago, IL</i> <ul style="list-style-type: none"><li>Designed MRI-compatible pneumatic tactile actuator (PIC32/custom PCB board) delivering 1.57N–11.60N constant-force; fMRI validation with 6 subjects mapped neural activity to primary/secondary somatosensory cortices and premotor regions.</li></ul>
01/2022 – 03/2022	<b>ROS Specialist Internship</b> , <i>Quanticity, Chicago, IL</i> <ul style="list-style-type: none"><li>Led a 4-member team to deploy an autonomous ground vehicle with visual SLAM (Simultaneous Localization and Mapping) and ROS 2 Galactic navigation.</li></ul>
06/2021 – 12/2021	<b>Research Assistant</b> , <i>Center for robotics and biosystems, Evanston, IL</i> <ul style="list-style-type: none"><li>Integrated Intel T265 tracking cameras and embedded computers across three omnidirectional robots, implementing AprilTag detection in ROS/OpenCV.</li><li>Developed a C++/OpenCV pipeline to calibrate and undistort dual fisheye lenses and generated 3D point clouds for disparity maps in ROS Noetic to enable real-time obstacle avoidance for mobile robots.</li><li>Implemented formation control and leader-follower algorithms for swarm control.</li></ul>

## Academic Accomplishments

### Journals (Peer-Reviewed)

- In Progress      **Yu, P.**, & Friesen, R. F. (2025). Exploration of Human Tactile Acuity via Sharing Grasping Experiences in Virtual Reality. (In Progress)
- 04/2025      Batteas, L. C., Volpi, D., **Yu, P.**, Hingwe, M., Kyei-Amponsah, K. N., Quek, F., Hipwell, C., & Friesen, R. F. (2025). Exploring passive presentation strategies for improved interpretation of haptic replay experiences [Manuscript submitted for publication to *IEEE Transactions on Haptics*].
- 03/2025      **Yu, P.**, Batteas, L. C., Ferris, T. K., Hipwell, M. C., Quek, F., & Friesen, R. F. (2025). Investigating passive presentation paradigms to approximate active haptic palpation. *IEEE Transactions on Haptics*, 18(1), 208–219. [10.1109/TOH.2024.3523259](https://doi.org/10.1109/TOH.2024.3523259).
- 01/2025      Harnett, M., Lacy, A. K., **Yu, P.**, & Friesen, R. F. (2025). Haptic interaction methods for freehand contour generation on a refreshable pin display. *Journal of Computing and Information Science in Engineering*, 25(3). [10.1115/1.4067417](https://doi.org/10.1115/1.4067417).

### Conferences (Full Length, Peer-Reviewed)

- 06/2025      **Yu, P.**, Urquhart, A., Kawazoe, A., Ferris, T., Hipwell, M. C., & Friesen, R. F. (2025). Soft haptic display toolkit: A low-cost, open-source approach to high-resolution tactile feedback. *2025 22nd International Conference on Ubiquitous Robots (UR)*. IEEE. (Accepted)
- 07/2025      Kawazoe, A., **Yu, P.**, Ferris, T., Friesen, R. F., & Hipwell, M. C. (2025). The impact of palpation motion on capturing lumps in tissue with force sensor. *2025 IEEE World Haptics Conference (WHC)*. (Accepted)
- 08/2025      Harnett, M.\*, **Yu, P.\***, & Friesen, R. F. (2025). Texture Design for Diverse Virtual Touch Sensations: Perceptual Breadth of Parameter-Driven Turing Patterns. *ASME 2023 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE2023)*. (Accepted). \*Co-first authorship.\*

### Conference Contributions and Work-in-Progress Papers

- 04/2024      **Yu, P.**, & Friesen, R. F. (2024). Sharing grasping experiences in virtual reality. *The 2024 Texas Regional Robotics Symposium (TEROS)*. (Conference Poster)
- 04/2024      **Yu, P.**, & Friesen, R. F. (2024). Exploring shared grasping experiences in virtual reality. *IEEE Haptics Symposium 2024 (HAPTICS)*. [Link](#). (Hands-on demonstration and work-in-progress paper)
- 08/2023      **Yu, P.**, & Friesen, R. F. (2023). Rubber hand illusion induced by a 3-dimensional platform for passive touch in remote palpation. *ASME 2023 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE2023)*. (Extended abstract; oral presentation)
- 07/2023      Batteas, L., Volpi, D., **Yu, P.**, Kyei-Amponsah, K., Quek, F., Friesen, R. F., & Hipwell, M. C. (2023). Optimizing passive presentation strategies for improved interpretation of haptic replay experiences. *Proceedings of the 2023 IEEE World Haptics Conference (WHC)*.

## Selected Projects

03/2021 – 06/2021

**Dual UR5 Arms Assembly**, *Northwestern University, Evanston, IL*

- Automated dual UR5 robotic arm assembly workflows using ROS (Robot Operating System) and MoveIt!, developing Lua/Python scripts to simulate collaborative tasks in CoppeliaSim.
- Engineered a dual-arm assembly platform to assemble four subcomponents into a primary unit, improving process efficiency by 20% compared to manual methods.

09/2019 – 04/2020

**Electrical Formula SAE**, *Florida Tech, Melbourne, FL*

- Designed and integrated a cooling system (radiator, fan shroud, electric fan, water pump) using Simulink simulations, reducing motor overheating risk by 35% during endurance testing.
- Developed a 3D-printed SolidWorks motor shield prototype to protect critical components from environmental debris, extending hardware lifespan by 50% in harsh conditions.

## Selected Activities

02/2024

**Houston Elementary S.T.E.M. Night**, *Bryan, TX*

- Led demonstrations of the WEART TouchDiver Haptic Glove to elementary students and their families, enhancing STEM education.
- Highlighted the glove's touch simulation capabilities, promoting engagement and interactive learning in STEM.

## Skills/Language

**Coding:** Python | C/C++ | C# | R | MATLAB

**Robotics:** ROS1/ROS2 | Socket/Serial Communication | OpenCV | SLAM | Navigation | MoveIt! | Gazebo | CoppeliaSim | Git | Unity | Universal Windows Platform (UWP)

**Mechatronics:** Raspberry Pi | Arduino | PIC32 microcontroller | PCB design | PWM | NI Data Acquisition (DAQ) Systems | DC/Servo/Stepper motors | Pneumatic system

**Mechanical:** ANSYS | Finite Element Analysis (FEA) | Solidworks | OnShape | Fusion 360 | MATLAB Simulink | 3D Printers

**Language:** Proficient in Mandarin | Fluent in English

## Honors/Memberships

**Graduate Student Travel Award** - J. Mike Walker '66 Department of Mechanical Engineering in Texas A&M University

**Cum Laude** - College of Engineering in Florida Tech

**Student Member** - American Society of Mechanical Engineers (ASME)

**Student Member** - Institute of Electrical and Electronics Engineers (IEEE)