Pijuan Yu

Phone: 321-339-7590
Email: pijuanyu@tamu.edu

LinkedIn | Github
Website | Google Scholar

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

Work Experience

08/2022 – Current	**Graduate Research Assistant,** *Texas A&M University, College Station, TX* • Developed a robotic platform enabling synchronized passive visual-haptic feedback for remote medical palpation with diagnostic accuracy at 75% without movement. • Integrated a wearable haptic glove in Unity to quantify size perception thresholds. • Develop low-cost, open-source soft haptic display toolkits (e.g., soft tactile displays, sensor-integrated platforms) to democratize access to high-fidelity tactile interfaces.
04/2022 – 08/2022	**Research Technician,** *The Feinberg School of Medicine, Chicago, IL* • Engineered a Python-based human-computer interface using an HBM 6-axis force sensor, streamlining data collection for a 12-participant study on force perception. • Prototyped an MRI-compatible tactile stimulator using a PIC32 microcontroller and custom PCB, achieving 3 levels of force feedback during fMRI compatibility tests. • Piloted experimental protocols in fMRI environments with six subjects, resolving calibration issues to ensure seamless integration with imaging systems.
01/2022 – 03/2022	**ROS Specialist Internship,** *Quanticity, Chicago, IL* • Led a 4-member team to deploy an autonomous ground vehicle with visual SLAM (Simultaneous Localization and Mapping) and ROS 2 Galactic navigation.
06/2021 – 12/2021	**Research Assistant**, *Center for robotics and biosystems, Evanston, IL* • Integrated Intel T265 tracking cameras and embedded computers across three omnidirectional robots, implementing AprilTag detection in ROS/OpenCV. • 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. • Implemented formation control and leader-follower algorithms for swarm control.

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.](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.](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.](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)