Puen Xu

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Senior Robotics Engineering Student at WPI

Email: pxu2@wpi.edu **GitHub**: //PuenXu **Portfolio**: //puenxu.github.io
LinkedIn: //puen-xu **Lab**: UH 150, WPI **Address**: Worcester, MA

Interests Dynamics and Control, Data-driven Control, Reinforcement Learning, Robot Learning

Education

University of Pennsylvania (Penn) Philadelphia, PA
M.S.E. in Robotics Starting Aug 2024
GRASP Laboratory, Incoming Robotics MSE Student

Worcester Polytechnic Institute (WPI) Worcester, MA
B.S. in Robotics Engineering Aug 2020 – May 2024
Robotics Engineering Department, *GPA: 3.95 / 4.00*

Awards and Recognitions

MQP (Senior Capstone) Award Honorable Mention, WPI May 2024
Graduation with High Distinction, WPI May 2024
National Name Exchange, WPI Mar 2023
Presidential Scholarship (Four years), WPI Aug 2020
Dean's List (Six times), WPI 2020 – 2023

Publications

[1] Fangzhou Lin, Shang Gao, Yichuan Tang, **Puen Xu**, Xihan Ma, Songlin Hou, Ziming Zhang, Haichong Zhang. **Zero-Shot Hybrid : Photoacoustic Image Denoising with Noisy Data Only.** *Submitted Mar 2024.*

Research Experience

Autonomous Loco-Manipulation Systems (ALMaS) Group, WPI Worcester, MA
Senior Capstone Student, Advisor: Prof. Mahdi Agheli Aug 2023 – May 2024
Designed, manufactured, and controlled a robotic arm for integration onto a Unitree Go1 quadruped robot. Collaborated with graduate students to incorporate the arm into Galileo, an in-house trajectory optimization solver at WPI, along with a whole-body controller framework, enabling agile loco-manipulation of the robot.

Medical Frontier US Imaging & Robotic Instru. (FUSION) Lab, WPI Worcester, MA
Research Volunteer, Advisor: Prof. Haichong Zhang Jan 2024 – Mar 2024
Proposed Zero-Shot Hybrid, a tuning-free denoising method that can adapt to complex noise patterns with stable inferencing by integrating ZS N2N training and BM3D algorithm. Demonstrated feasible performance on phantom, ex vivo, and in vivo data of Photoacoustic imaging compared with other learning-based and mathematical denoising methods.

Robots & Sensors for Human Well-Being (ROSE-HUB), WPI Worcester, MA
Research Assistant, Advisor: Prof. Greg Lewin Aug 2023 – Dec 2023

Designed, fabricated, and wired a mobile robot to patrol power transmission lines to deter ravens using a combination of audio and visual stimuli from tampering with high-voltage wires. Developed a YOLOv5 raven detection algorithm to be integrated with a ROS controller framework to interface with actuators and sensors.

Teaching Experience

Robotics Engineering Department, WPI — Worcester, MA
Student Assistant — Aug 2023 – May 2024
Guided and managed student-led laboratories in core senior-level robotics courses, facilitating the application of classroom knowledge to accomplish complex projects.
- RBE 3002: Unified Robotics IV - Navigation, B-Term 2023 & D-Term 2024
- RBE 3001: Unified Robotics III - Manipulation, A-Term 2023 & C-Term 2024

Academic Resources Center, WPI — Worcester, MA
Peer Tutor — Aug 2023 – Oct 2023
Provided individual peer tutoring to help students to understand materials in lecture and reading in textbooks, master new concepts, and put ideas into perspective.
- ES 2503: Introduction to Dynamic Systems, A-Term 2023
- ES 2501: Introduction to Static Systems, A-Term 2023

Mathematical Sciences Department, WPI — Worcester, MA
Peer Learning Assistant — Aug 2022 – May 2023
Facilitated weekly discussions for students to reinforce key concepts from the lectures and guided them through selected practice problems.
- MA 2611: Applied Statistics I, B-Term 2022 & D-Term 2023
- MA 1023: Calculus III, C-Term 2023
- MA 2051: Ordinary Differential Equations, A-Term 2022

Skills

Robotics
ROS, Linux, Mechanical Design, Embedded Systems, Robot Programming (C++, Python, MATLAB), Convex Optimization, Optimal Control, Reinforcement Learning

Languages
Bilingual in English and Mandarin, Competent in Japanese, French, and Spanish

Professional Associations

IEEE Robotics and Automation Society	Apr 2024 – Present
Institute of Electrical and Electronics Engineers	Apr 2024 – Present
Society for Industrial and Applied Mathematics	Feb 2024 – Present
Tau Beta Pi (Engineering Honor Society)	Apr 2023 – Present