

# Junxiang (Jim) Wang

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## EDUCATION

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### Carnegie Mellon University

Doctor of Philosophy, Robotics

Pittsburgh, PA

Expected May 2029

### Johns Hopkins University

Master of Science in Engineering, Robotics

Baltimore, MD

May 2024

Bachelor of Science, Mechanical Engineering

May 2023

Second major: Applied Mathematics and Statistics

- Cumulative GPA: 3.93
- B.S. graduated with general and departmental honors
- President, Pi Tau Sigma—Honor Society for Mechanical Engineers
- Member, Tau Beta Pi—The Engineering Honor Society

### Kent School

High School Diploma (GPA: 5.87 out of 6.0)

Kent, CT

June 2019

## RESEARCH EXPERIENCE

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### Sensing, Manipulation, and Real-Time Systems Laboratory

Baltimore, MD

Research Assistant

September 2021—May 2024

- Designed a robot-assisted PET imaging system that measures and follows small-range human head motion while the subject is engaged in natural activities such as locomotion on a treadmill.
  - Developed a robust and accurate measurement system with draw-string displacement encoders.
    - Accuracy better than 0.5mm at a 1-kHz frequency.
  - Developed controllers in C++ for reproduction of human head motion on a UR3, as well as for compensation of this motion on a UR5 guided by measurements from the string encoder system.
    - Achieved motion tracking within an 18-mm clearance and under a 55-ms latency.
  - Constructed a mock PET system with laser diodes instead of positrons to validate the string encoder system's performance when applied to image reconstruction during post-processing.
- Led the development of a digital twin for the da Vinci surgical robot, to be used for virtual assistance while communication is broken during teleoperation of the surgical robot.
  - Explored different strategies for recovery when communication is restored, after the user teleoperated in a virtual, simulated twin environment during communication loss.

### Intuitive Computing Laboratory

Baltimore, MD

Research Assistant

September 2021—May 2024

- Assisted with the design of a tabletop companion robot that guides older adults through simple physical exercises while providing visual and audio feedback.
  - Designed explainable machine learning model for pose classification and feedback during exercises.
  - Configured natural, semantic robot movements for greater amiability.
- Assisted with a study that incorporates large-language models with voice assistants that surpasses traditional voice assistants in key aspects such as sustaining conversations, understanding context, and tolerating word-level errors.

## PUBLICATIONS

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- J. Wang, I. I. Iordachita, and P. Kazanzides. "Method for robotic motion compensation during PET imaging of mobile subjects." In *IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Oct. 2023.

- [J. Wang](#), T. Wu, I. I. Iordachita, and P. Kazanzides. “Calibration and evaluation of a motion measurement system for PET imaging studies.” In *J. of Medical Robotics Research (JMRR)*, vol. 8, 2023.
- [J. Wang](#), T. Wu, I. I. Iordachita, and P. Kazanzides. “Evaluation of a motion measurement system for PET imaging studies.” In *IEEE Intl. Symp. on Medical Robotics (ISMR)*, Apr. 2022. **Best Student Paper.**
- [A. Mahmood](#), [J. Wang](#), [B. Yao](#), [D. Wang](#), and [C. Huang](#). “User interaction patterns and breakdowns in conversing with LLM-powered voice assistants.” *Under Review.*

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## ***TEACHING EXPERIENCE***

### **Johns Hopkins University**

Baltimore, MD

Teaching Assistant

January 2022—Present

- Serving as a teaching assistant for various courses at JHU: Electronics and Instrumentation (S’22), Robot Sensors and Actuators (F’22), and Robot Devices, Kinematics, Dynamics, and Control (S’23-F’23).
- Responsibilities include grading, holding office hours, handling questions online, and offering in-person help on projects and lab assignments that involve robot arms, sensors, motors, and circuits.

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## ***INDUSTRY EXPERIENCE***

### **CRRC Dalian Co. Ltd.**

Dalian, China

Engineering Intern

May 2021—August 2021

- Assisted with the design of heat exchangers for high-speed electric locomotives.
- Analyzed flow properties within air-cooled and water-cooled heat exchangers with CFD analysis.
- Conducted experiments for the potential use of phase-change materials in locomotive break plate.

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## ***EXTRACURRICULAR ACTIVITIES***

### **Johns Hopkins Robotics Club**

Baltimore, MD

Member, Navigation Team

September 2021—May 2022

- Contributed to the design of an autonomous food delivery robot that aims to perform on-campus to-building delivery from restaurants in the vicinity.
- Primarily worked on the localization component with Kalmer filter.
- Handled data reading and processing from a lidar, as well as its integration with the rest of the system.

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## ***HONORS AND AWARDS***

- [Best student paper](#), 2022 International Symposium on Medical Robotics (ISMR): awarded to the best paper presentation with student first-author at ISMR 2022.
- [Honorable mention](#), CRA outstanding undergraduate researcher: recognizes undergraduate students who show outstanding research potential in an area of computing research.
- [Charles A. Miller award](#): recognizes outstanding academic achievement of an undergraduate JHU student in Mechanical Engineering. (2/40)
- [Dean’s List](#) at JHU for all semesters offered.

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## ***TECHNICAL SKILLS***

- Software: MATLAB, C/C++, Python, ROS, Linux, SOLIDWORKS, Java, Abaqus, COMSOL
- Basic machining, milling, lathing, laser cutting, 3D printing
- Foreign languages: Mandarin (fluent), French (intermediate)