

HUY QUYEN (JASON) NGO

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SUMMARY

Seeking internship positions in Robotic Manipulation, Machine Learning, and Human-Robot Interaction.

EXPERIENCE

PhD Candidate, Carnegie Mellon University - Robotics Institute *Sep 2022 - Present*

- Conduct research and literature review for the Robot Proficiency Self-Assessment project in Human-Robot Interaction, spearheading the robot failure and explanation line of research in explainable AI and robot domain.
- Develop C++ and Python programs and ROS packages for the vision and control systems of the 7-DOF Fetch Robot, enabling automation and teleoperation capabilities on robots for various manipulation and interaction research.
- Conceptualize and execute robotic manipulation techniques to assess the performance of various modes of robot communications in failure scenarios during human-robot collaborative object manipulation tasks.
- Innovate and implement natural language processing and visual image projection as tools for robotic communications, which is proven to be 60% more effective than non-verbal behaviors in explainable robots.
- Design user studies with more than 40 in-person participants and perform statistical analysis to explore the influence of robot behaviors on humans, contributing to the understanding of explainable AI and robots in human-robot interaction.
- Lead the design, development, and maintenance of hardware components for the Fetch Robot, focusing on tailored end-effectors, to enhance the versatility and performance of human-centric manipulation tasks.

PhD Candidate, Carnegie Mellon University - Mechanical Engineering Department *Aug 2021 - Aug 2022*

- Conducted research and literature review on Multimodal Haptic Guidance Robots, enforcing the effectiveness of using physical haptic devices as guidance systems for visually-impaired people.
- Conceptualized and optimized an Arduino-controlled mobile manipulator robot with customized humanoid end-effectors, which can seamlessly integrate various haptic component hardware for guidance purposes.
- Designed and innovated multimodal and bidirectional haptic interface designs, focusing on verbal and nonverbal communications from robots to humans using kinesthesia and tactile feedback.
- Executed and improved a guidance system in crowded environments, with an emphasis on psychophysical interactions and combined verbal/non-verbal communications between humans and robots.

Applied Research Scientist Intern, Aptiv LLC *May 2021 - Aug 2021*

- Conducted research and literature review on Radar-based Map Validation for Autonomous Vehicles.
- Implemented data-driven machine learning algorithms for map validation techniques and change detection for autonomous driving systems, which proved to be effective in real-world scenarios.
- Designed, and tested map validation systems using on-board radar to enable the detection of real-time map alterations in driving logs, as compared to established reference maps.
- Devised a comprehensive evaluation framework for map validation systems, taking into account accuracy, robustness, scalability, and other pertinent metrics for the company's autonomous vehicle platforms.

PROJECTS

6-DOF Robotic Manipulator Project (Robotic Systems Lab course)

- Implemented computer vision systems to categorize block colors for manipulation tasks with a 5-DOF robot arm.
- Executed Forward Kinematics, Inverse Kinematics, and PID controllers for robot end-effector to grasp and manipulate AprilTag blocks for pick-and place, block stacking, and block handling tasks.

EDUCATION

Doctor of Philosophy, Robotics & Mechanical Engineering *Aug 2021 - May 2026*
Carnegie Mellon University

Master of Science in Engineering, Mechanical Engineering *Sep 2019 - Apr 2021*
University of Michigan - Ann Arbor

Bachelor of Engineering, Electrical & Electronic & Information Engineering *Oct 2015 - Sep 2019*
Nagoya University

SKILLS

Programming Languages: C, C++, Python, MATLAB

Technical Skills: ROS, Linux, Computer Vision, Deep Learning, Robot Design, Robot Manipulation, Statistical Analysis

Publications

Ngo, H.Q., Carter, E., & Steinfeld, A. (2024). Human Perception of Robot Failure and Explanation During a Pick-and-Place Task. *ACM/IEEE International Conference on Human-Robot Interaction (HRI)* (under review).