

# HUY QUYEN (JASON) NGO

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## SUMMARY

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

## EDUCATION

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**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

## EXPERIENCE

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**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.
- 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.
- Develop modified XGBoost-based & Transformer-based neural network architectures and wearable wrist devices for predicting real-time trust in Human-Robot Interaction using Human Physiological and Behavioral data.

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

- Conducted research and literature review on Multimodal Haptic Guidance Robots 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*

- 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

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### **Robust Convolutional Malware Classification using Feature Squeezing (Deep Learning course)**

- Built a robust convolutional neural network system for malware detection in the scenarios of adversarial attacks.
- Utilized feature squeezing to compress input data and remove redundant features, reducing external control of output.
- Improved the malware detection accuracy by 12% and precision by 1.8% in worst-case perturbation scenarios.

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

- Implemented Computer Vision, 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.

## SKILLS

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

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

## Publications

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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).