HUY QUYEN NGO

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SUMMARY

Seeking research-oriented positions in Robotic Manipulation, Machine Learning and Human-Robot Interaction

EDUCATION

Doctor of Philosophy, Robotics — *Aug 2022 - May 2026*
Carnegie Mellon University — GPA: 4.0/4.0
Master of Science in Engineering, Mechanical Engineering — *Sep 2019 - Apr 2021*
University of Michigan - Ann Arbor — GPA: 3.865/4.0
Bachelor of Engineering, Electrical & Electronic & Information Engineering — *Oct 2015 - Sep 2019*
Nagoya University — GPA: 3.95/4.3

SKILLS

Programming Languages: C, C++, Python, MATLAB
Technical Skills: ROS, Linux, Machine Learning, Computer Vision, Deep Learning, Embedded Systems (Raspberry Pi, Arduino), Simulation (Gazebo, PyBullet), Robot Design
Relevant Coursework: Computer Vision, Machine Learning, Deep Learning, Visual Navigation for Autonomous Aerial Vehicles, Hand Design and Control for Dextrous Manipulation, Advanced Mechatronic Design

EXPERIENCE

PhD Candidate, Carnegie Mellon University — *Sep 2022 - Present*
- Conduct extensive research and literature review on the subject of Robot Proficiency Self-Assessment within the domain of Human-Robot Interaction, with the aim of improving collaboration and efficiency in various settings
- Develop advanced software solutions for the control and manipulation of the Fetch Robot, effectively enabling the communication of visual non-verbal cues regarding robot performance and potential failures to human operators
- Conceptualize and implement methods and algorithms to accurately assess robot performance in intricate tasks while designing motion behaviors to convey the robot's current state and difficulty experienced while performing tasks
- Carry out in-depth user studies to analyze the influence of motion behaviors on promoting productive interactions between humans and robots, as well as to identify potential areas for further improvement and optimization
- Design, develop, and maintain critical hardware components of the Fetch Robot, focusing on the creation of customized manipulation end-effectors, to ensure seamless and efficient robotic performance in various applications

Research Assistant, Carnegie Mellon University — *Aug 2021 - Aug 2022*
- Research Title: Human-Robot Interaction with Multimodal Haptic Guidance Robots
- Conducted a comprehensive and in-depth literature review of multimodal and bidirectional haptic interface designs, focusing on nonverbal communication such as kinesthesia, skin-stretch, hand squeeze, and vibrotactile feedback
- Designed, optimized, and programmed an Arduino-controlled robotic arm, complete with a customized humanoid hand, to seamlessly integrate haptic components into an existing guidance robot
- Devised and implemented guidance systems that placed significant emphasis on psychophysical interactions and non-verbal perception, specifically targeting the needs of visually-impaired individuals

Applied Research Scientist Intern, Aptiv LLC — *May 2021 - Aug 2021*
- Research Title: Radar-based Map Validation for Autonomous Vehicles
- Conducted literature review on data-driven machine learning algorithms, specifically map validation techniques and change detection for autonomous driving systems in real-world scenarios
- Designed, implemented, and rigorously tested map validation systems by integrating on-board radar data 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 crucial factors such as accuracy, robustness, scalability, and other pertinent metrics
- Served as the first author of a paper entilted "Map Validation for Autonomous Driving Systems - A Review," which delves into the findings related to the development of radar-based map validation techniques for autonomous vehicles

PROJECTS

6-DOF Robotic Manipulator Project (Robotic Systems Lab course)
- *Perception*: Use traditional computer vision to distinguish block colors for pick-and-place task with arm manipulation
- *Acting:* Used Forward Kinematics & Inverse Kinematics and PID controllers to control robot end-effector to grasp and manipulate color-coded blocks

Manuscript

H. Q. Ngo and K. Zhang, "Map Validation for Autonomous Driving System - A Review". https://tinyurl.com/3vb749hd