Hai Nguyen

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Experienced researcher in **data-driven decision-making** under **partial observability** and **uncertainties**, using **memory-based reinforcement learning** with the main focus on **robot manipulation applications**.

Education

Ph.D. in Computer Science, Northeastern University (3.93/4.0), USA — 2019 - 2024 (Expected)
M.Sc. in Unmanned Aircraft Systems Design, University of Southampton, UK — 2016-2017
B.Sc. in Control & Automation Engineering, Hanoi University of Science and Technology, Vietnam — 2007-2012

Engineering Skills

Languages: Matlab, C/C++, Python
Technologies/Frameworks: PyTorch, ROS, MuJoCo, PyBullet, Gazebo, OpenRave, LSTM/GRU, Transformer

Work Experience

Ph.D. Student, LLPR Lab & Helping Hands Lab, Northeastern University — **Sep. 2019 - Present**
Reinforcement Learning (RL) in Robotics under Partial Observability — *Advisors: Chris Amato, Robert Platt*

- Leveraged privileged information during training for efficient memory-based RL, performed Sim2Real
- Developed a hierarchical RL agent: memory-based top policy and memory-less bottom policy
- Leveraged domain symmetry for efficient memory-based RL under partial observability, performed Sim2Real

Research Intern, OMRON SINIC X Corporation, Tokyo, Japan — **May 2023 - Sep. 2023**
Online RL under Partial Observability — *Mentors: Masashi Hamaya, Tadashi Kozuno*

- Learned a memory-based policy directly on hardware for Peg-In-Hole task using F/T feedback and 50 episodes of human demonstration in 2 hours

Research Assistant, ARA & ARL Lab, University of Nevada, Reno — **Sep. 2018 - Jun. 2019**
Deep Learning Research — *Advisors: Kostas Alexis, Hung La*

- Implemented visual-based crack detectors on steel structures and concrete bridges
- Developed an object detector using thermal images for team CERBERUS to deploy on drones underground (later won the DARPA Subterranean Challenge 2021)
- Developed an RL mobile robot agent to open doors autonomously from RGB images in MuJoCo

Flight Software Developer, Viettel Aerospace Institute, Vietnam — **2012-2016 & 2017-2018**
Autopilot Software for Drones

- Developed control & path planning algorithms for an FPGA-based autopilot for fixed-wing drones
- Implemented control algorithms allowing a quad-plane to perform fixed↔rotary-wing mid-flight
- Developed hardware/software-in-the-loop using FlightGear and XPlane simulators

Selected Publications (Full List)

"Equivariant Reinforcement Learning under Partial Observability", *Conf. on Robot Learning (**CoRL**), 2023*, Code

"On-Robot Bayesian Reinforcement Learning for POMDPs", *IEEE/RSJ International Conf. on Intelligent Robots and Systems (**IROS**), 2023*

"Leveraging Fully Observable Policies for Learning under Partial Observability", ***CoRL***, 2022, Code

"Hierarchical Reinforcement Learning under Mixed Observability", *International Workshop on the Algorithmic Foundations of Robotics (**WAFR**), 2022*

"Belief-Grounded Networks for Accelerated Robot Learning under Partial Observability", ***CoRL***, 2020, Code

Awards

Graduate Dean's Merit Scholarship, University of Nevada, Reno ($10k) — **2018**
IMechE UAS 2017 Autonomous Drone Challenge, Runner-up & Navigation Accuracy Award — **2017**
Chevening Scholarship, British Foreign and Commonwealth Office (**2%** acceptance rate) — **2016**