PEIDE HUANG

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EDUCATION

Carnegie Mellon University September 2020 - Present
M.S. in Machine Learning
Ph.D. in Mechanical Engineering *Pittsburgh, PA, US*
Academic advisors: Prof. Ding Zhao (SafeAI Lab), Prof. Fei Fang (AI and Social Good Lab)

Stanford University September 2018 - April 2020
M.S. in Mechanical Engineering (Robotics Track), GPA: 3.9/4.0 *Stanford, CA, US*

Nanyang Technological University, Singapore September 2014 - May 2018
B.E. in Aerospace Engineering with Highest Distinction, GPA: 4.9/5.0 *Singapore*

CURRENT RESEARCH

Peide Huang's research goal is to understand the interplay between the reinforcement learning agents and the tasks, with the objective of enabling robust, safe, and explainable decision-making. To achieve this goal, he leverages curriculum learning, representation learning, and game theory. He also tackles real-world applications in robotics, autonomous driving, and healthcare.

SELECTED PUBLICATIONS

1. **Curriculum Reinforcement Learning using Optimal Transport via Gradual Domain Adaptation**
   Peide Huang, Mengdi Xu, Jiacheng Zhu, Laixi Shi, Fei Fang, Ding Zhao.
   The 36th Conference on Neural Information Processing Systems (NeurIPS 2022)

2. **Robust Reinforcement Learning as a Stackelberg Game via Adaptively-Regularized Adversarial Training**
   Peide Huang, Mengdi Xu, Fei Fang, Ding Zhao.
   The 31st International Joint Conference on Artificial Intelligence (IJCAI 2022).

3. **Scalable Safety-Critical Policy Evaluation with Accelerated Rare Event Sampling**
   Mengdi Xu, **Peide Huang**, Fengpei Li, Jiacheng Zhu, Xuewei Qi, Kentaro Oguchi, Zhiyuan Huang, Henry Lam, and Ding Zhao.
   IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2022).

4. **Group Distributionally Robust Reinforcement Learning with Hierarchical Latent Variables**
   Mengdi Xu, **Peide Huang**, Yaru Niu, Visak Kumar, Jielin Qiu, Chao Fang, Kuan-Hui Lee, Xuewei Qi, Henry Lam, Bo Li, Ding Zhao.
   The 26th International Conference on Artificial Intelligence and Statistics (AISTATS 2023)

5. **Trustworthy Reinforcement Learning Against Intrinsic Vulnerabilities: Robustness, Safety, and Generalizability**
   Peide Huang*, Mengdi Xu*, Zuxin Liu*, Wenhao Ding, Zhepeng Cen, Bo Li, Ding Zhao.
   Preprint.

6. **Multimodal Representation Learning of Cardiovascular Magnetic Resonance Imaging**
   Peide Huang*, Jielin Qiu*, Makiya Nakashima, Jaehyun Lee, Jiacheng Zhu, Wilson Tang, Pohao Chen, Christopher Nguyen, Byung-Hak Kim, Debbie Kwon, Douglas Weber, Ding Zhao, David Chen.
   Preprint.

7. **Cardiac Disease Diagnosis on Imbalanced Electrocardiography Data Through Optimal Transport Augmentation**
   Jielin Qiu, Jiacheng Zhu, Mengdi Xu, **Peide Huang**, Michael Rosenberg, Douglas Weber, Emerson Liu, Ding Zhao
   2023 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2023)

8. **Continual Reinforcement Learning with Group Symmetries**
   Shiqi Liu, Mengdi Xu, **Peide Huang**, Yongkang Liu, Kentaro Oguchi, Ding Zhao
   Preprint

9. **Coalitional Fairness of Autonomous Vehicles at a T-Intersection**
   Diana Gomez, Haohong Lin, **Peide Huang**, Corey Harper, Ding Zhao.
   2022 IEEE 25th International Conference on Intelligent Transportation Systems (ITSC 2022)

10. **Latent Goal Allocation for Multi-Agent Goal-Conditioned Self-Supervised Imitation Learning**
    Peide Huang*, Rui Chen*, and Laixi Shi*.
    NeurIPS 2021 Bayesian Deep Learning Workshop.

AWARDS AND HONORS

· CMU Machine Learning Department Fellowship 2023-2024

· NeurIPS 2022 Scholar Award

· NeurIPS 2022 Top Reviewer (8% of all reviewers)

· CMU 2022 Graduate Student Assembly/Provost Conference Funds

· ICLR 2021 Travel Award

· NTU 2016 President Research Scholar with Distinction

INTERNSHIP EXPERIENCE

Cleveland Clinic Foundation September 2022 - May 2023
Machine Learning Research Intern *Ohio, US*

· Proposed a novel multi-modal representation learning framework to work with complex sequences of cardiovascular Magnetic Resonance Imaging (cMRi).

· Communicated with doctors and medical experts to understand the challenges faced in medical imaging analysis and complement the machine learning model with domain knowledge.

Flexiv Robotics Ltd. June 2019 - September 2019
System Engineer Intern *California, US*

· Established a new experimental software and hardware framework to expedite the prototyping and testing procedure of products in development. Developed a multi-threaded inter-process communication software library to achieve more robust and faster communication between middle-ware modules.

· Coordinated with senior engineers and managers to ensure smooth integration of the new framework into the R&D department. Constructed a standard operating procedure for the experimental setup.

Agency for Science, Technology and Research, Singapore January 2017 - June 2017
Research Assistant *Singapore*

· Designed and developed a variable footprint, Omni-directional mobile robotic platform that can change the morphology for increased stability or compactness in response to the task requirements.

· Communicated with the supervisor and managed the project timeline, budgeting, and deliverables.

PROFESSIONAL SERVICES

Reviewer NeurIPS, ICML, AISTATS, ICASSP

SELECTED PRESENTATIONS

- Bayesian Deep Learning Workshop, NeurIPS 2021
- Workshop on Security and Safety in Machine Learning Systems, ICLR 2021

TEACHING AND LEADERSHIP EXPERIENCE

CMU Modern Control Theory, Fall 2021	Head of teaching assistants
CMU Linear Control Systems, Fall 2020	Head of teaching assistants
NTU Introduction to Computing, Spring 2016	Peer tutor
NTU Robotics Club	Co-founder and Vice President