Yiqi Wang

email: yiqiw2@andrew.cmu.edu | website: https://yiqiwang8177.github.io/

Education

Carnegie Mellon University (CMU) Pittsburgh, PA Master of Science in Electrical and Computer Engineering (Advanced) Aug 2022 – May 2024 GPA: **3.8**/4.0 Selected Coursework: Deep reinforcement learning and control, Speech recognition and understanding, Learning for manipulation.

University of Wisconsin, Madison (UW Madison)

Bachelor of Science in Computer Sciences, distinction. GPA: 3.9/4.0

Selected Coursework: Prob & info theory in ML, Matrix methods in ML, Big data system, Intro to AI, Intro to operating system

Research Experience

Prof. Yuejie Chi Group (CMU, ECE) Graduate Research Assistant, supervised by Prof. Yuejie Chi.

Led a project on offline reinforcement learning (RL).

- Proposed to formulate offline RL as a multimodal sequence modeling problem.
- Designed a multimodal model driven by the importance of modalities from attention analysis.
- Proposed Decision-Transducer (DTd) becomes SOTA transformer on offline RL benchmark D4RL.
 - Only required 50% gradient steps to reach the performance of prior works.
 - Surpassed all prior art on average and 6 out of 9 cases compared to other transformers.
- Published a first author paper at a peer-reviewed AI conference (UAI 2023)
 - A Trajectory is Worth Three Sentences: Multimodal Transformer for Offline RL.
- Led a project regarding dynamic resource scheduling on cloud via a scalable RL scheduler.
 - Improved a DQN to fuse multimodal system states via feature-wise affine transformation (FiLM), resulted in 35% reduction on power consumptions (i.e., increase 35% episodic return).
 - Proposed to pretrain DQN on 25 synthetic short-horizon environments using Automatic Domain Randomizations. The resulted policy could meet all performance requirements on unseen longhorizon environments without packet drops and saved 13% power consumption.
 - 1st author paper submission to Globecom 2024.

Prof. Chris G. Atkeson Group (CMU, Robotics Institute)

Graduate Researcher, supervised by Prof. Chris G. Atkeson

- Leading a project on skill acquisition for robots by visually imitating human demonstration.
 - Building reward function to supervise skill learning by leveraging video-video contrastive model. Designing a novel reward function to leverage multiple demonstrations together while
 - maintains hierarchy between demonstrations, to improve sample efficiency of the RL training. - Acquiring the robot manipulation skill using deep RL.
 - Work in progress.

Individual Research Project (CMU)

Project Lead

- Exploring the effect of modality gap when leveraging text and audio pretrain models together.
 - Proposing a decoder-only ASR model that could be seamlessly initialized by a pre-trained LM.
 - _ Bridging the modality gap between speech and text-only pretrain models by adding grounding objectives and training extra models to connect frozen pretrain models.
- Managing weekly discussions with Jianyu Mao, Aditya Rathod from ECE and LTI department at CMU.

Informatics Skunkworks, (UW Madison)

Undergraduate Researcher, mentored by Prof. Dane Morgan

- Research on the out-of-domain (OOD) detection techniques for machine learning models.
 - Proposed contrastive metric learning for OOD detection on 4 material science data.
 - Results surpassed popular gaussian process regression variance on 3 material science datasets.
- Contributed to the development of the software.

Aug 2022 – Present

Sept 2019 - May 2022

Madison. WI

Pittsburgh, PA

Sept 2022 – Feb 2023

Jan 2023 – Present

Pittsburgh, PA

Pittsburgh, PA

Feb 2021 – May 2022

Madison. WI

Paper draft in progress (2nd author).

Cathaypath Institute of Science

Group Project, supervised by Prof. Patrick Houlihan (Columbia University)

Designed a multimodal pipeline for image-caption matching on Wikipedia image/text dataset.

Oct 2021 – Dec 2021

Aug 2022 – Present

- Leveraged the attention mechanism for a fine-grained image-text grounding. July 2018 – Aug 2018
- Group Project, Mentor: Prof. Bart Selman (Cornell University)
 - Devised a planning-based reinforcement learning software for Connet-4 game.
 - Experimented different heuristics for pruning search tree of a real-time game play agent.

Mentoring Experience

Graduate Research Assistant, Prof. Yuejie Chi (CMU) Group

- Guided an undergraduate student on the research project related to RL.
 - Led the weekly discussion on the concepts related to the project and introducing papers.
 - _ Providing weekly feedback on undergraduate student's progress, including technical support.

Student Mentor for Intro to Operating System (CS 537), Instructor: Prof. Yuvraj Patel Madison, WI

Held weekly office hour to mentor undergraduate students on conceptual / coding assignments.

SKILLS & LANGUAGES & Certificates

Computer Language: Python (expert), C (fluent), Java (familiar) Pytorch (expert), flax/jax (fluent), tensorflow (familiar) Framework: Robots: Ufactory xArm (fluent), Franka Emika (familiar) Languages: English, Mandarin, Cantonese Deep learning specification (coursera), Natural language understanding(Stanford) Certificates:

HONORS & AWARDS

- Top 3% Kaggle: CommonLit Readability Prize Rate the complexity of passages. (75th / 3633, Silver)
- _ 1st Place Campus Level (Only Candidate Selected for 2019 National Contest), Virtual Instrument Contest Dean's list 3 times, University of Wisconsin-Madison, 2021-2022
- Graduated in distinction, University of Wisconsin-Madison, 2019-2022
- First Class Scholarship & Merit Student (Top 10%), Dalian Polytechnic University, 2017-2018