Yiqi Wang

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Education

Carnegie Mellon University (CMU)   Pittsburgh, PA
Master of Science in Electrical and Computer Engineering (Advanced)   Aug 2022 – Present
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)   Madison, WI
Bachelor of Science in Computer Sciences, **distinction**.   Sept 2019 - May 2022
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)   Aug 2022 – Present
Graduate Research Assistant, supervised by Prof. Yuejie Chi.   *Pittsburgh, PA*
- 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 long-horizon environments without packet drops and saved 13% power consumption.
  - 1st author paper submission to Globecom 2024.

Prof. Chris G. Atkeson Group (CMU, Robotics Institute)   Jan 2023 – Present
Graduate Researcher, supervised by Prof. Chris G. Atkeson   *Pittsburgh, PA*
- 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)   Sept 2022 – Feb 2023
Project Lead   *Pittsburgh, PA*
- 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)*   Feb 2021 – May 2022
Undergraduate Researcher, mentored by Prof. Dane Morgan   *Madison, WI*
- 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.

- Paper draft in progress (2nd author).

Cathaypath Institute of Science

Group Project, supervised by Prof. Patrick Houlihan (Columbia University)   Oct 2021 – Dec 2021
- o Designed a multimodal pipeline for image-caption matching on Wikipedia image/text dataset.
- o Leveraged the attention mechanism for a fine-grained image-text grounding.

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

Mentoring Experience

***Graduate Research Assistant**, Prof. Yuejie Chi (CMU) Group*   Aug 2022 – Present
- 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)
- Framework: Pytorch (expert), flax/jax (fluent), tensorflow (familiar)
- Robots: Ufactory xArm (fluent), Franka Emika (familiar)
- Languages: English, Mandarin, Cantonese
- Certificates: Deep learning specification (coursera), Natural language understanding(Stanford)

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