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: **4.0**/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: **3.941**/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 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).
  - Pretrained a DQN on hundreds of simulated short-horizon environments using Automatic Domain Randomizations. The resulted policy could meet all performance requirements on multiple unseen long-horizon environments without any online adaptations.
  - Work in progress.

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 cost-effective skill acquisition for robots by leveraging data (prior) from human.
  - Scraping human activities from web (YouTube) to build offline data (prior) for skill learning.
  - Proposed to learn skill from human priors via:
    - Constructing skill learning priors by aligning human activity videos with text (transcriptions) via open-vocabulary action detection.
    - Building reward function to supervise skill learning by training contrastive model on the text-video pairs (text2human) and video-video pairs (human2robot).
    - Acquiring the skill of interest using deep RL (e.g., maximizing long-term reward).
  - Work in progress.

Individual Research Project (CMU) Sept 2022 –Present
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.
  - Work in progress
- 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

- Designed a multimodal pipeline for image-caption matching on Wikipedia image/text dataset.
- Leveraged the attention mechanism for a fine-grained image-text grounding.

Group Project, Mentor: Prof. Bart Selman (Cornell University) July 2018 – Aug 2018

- 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* 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