MINGXUAN LI

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EDUCATION

Columbia University *Sept. 2021 - Now*
Ph.D. Student in Computer Science (Causal Inference & Reinforcement learning)
Advisor: Elias Bareinboim.

Brown University *Sept. 2019 - June 2021*
Sc.M. in Computer Science, GPA: 4.0/4.0
Advisor: Michael L. Littman.

Beihang University *Sept. 2015 - June 2019*
B.Sc. in Computer Science and Technology, GPA: 3.7/4.0
Advisor: Jingyuan Wang

RESEARCH INTERESTS

Causal Inference, Reinforcement Learning

PUBLICATIONS

- "Learning Generalizable Behavior via Visual Rewrite Rules" - *AAAI-22 Workshop on Reinforcement Learning in Games* Yiheng Xie*, **Mingxuan Li***, Shangqun Yu*, Michael L. Littman
- "Towards Sample Efficient Agents through Algorithmic Alignment" - *AAAI-21 Student Abstract and Poster Program* **Mingxuan Li**, Michael L. Littman
- "Interpretability is a Kind of Safety: An Interpreter-based Ensemble for Adversary Defense" - *KDD-20* Jingyuan Wang, Yufan Wu, **Mingxuan Li**, Xin Lin, Junjie Wu, Chao Li

SELECTED RESEARCH EXPERIENCE

Causal Curriculum Learning Feb. 2022 - Sept. 2023
Advisor: Prof. Elias Bareinboim *Causal AI Lab, Columbia University*

· Identified a confounded problem setting where state-of-the-art curriculum learning methods collapse;
· Analysed and proved the graphical conditions for optimal policy transfer to hold;
· Proposed a principled way of designing causally aligned curricula in confounded environments.

Learning to Control with the Explainable Latent Dynamics Graph Jan. 2021 - Sept. 2021
Advisor: Prof. Michael L. Littman *RLab, Brown University*

· Led the effort to build a generalizable StarCraft agent for the DARPA XAI project;
· Designed the Latent Relational World Model, an explainable world model based on GNNs that learns object-oriented latent dynamics from purely pixel inputs;
· Proposed a soft lambda return actor-critic algorithm learning behaviors from simulated trajectories;

Towards Sample Efficient Agents through Algorithmic Alignment Mar. 2020 - May 2020
Advisor: Prof. Michael L. Littman *RLab, Brown University*

· Revealed the potential of GNNs in sample efficient learning by creating the Deep Graph Value Networks (DeepGVs);
· DeepGVs efficiently solved MDPs and outperformed unstructured baseline by over 50%;
· Resulted in a short paper accepted by AAAI-21 Student Abstract and Poster Program.

Robust Adversaries Detection and Recovery Mar. 2019 - Nov. 2019
Advisor: Prof. Jingyuan Wang, Dr. Shuchang Zhou *Megvii CV Group, Beihang U*

· Was a key player in designing an input sensitivity-based adversarial examples detection and recovery pipeline which achieved an average of 96% detection accuracy and high robust classification accuracy against famous adversaries;
· Developed a theoretical explanation of L_2 adversarial examples' intrinsic properties that can differentiate them from normal inputs;
· Formed a research paper as the first author, and a revised version was accepted by KDD 2020.

INDUSTRIAL EXPERIENCE

Amazon Jun. 2021 - Aug. 2021
Advisor:Dr. Prag Mishra *Applied Scientist Intern, Amazon Seattle*

· Analysed billions of delivery trajectories to identify the bottleneck in delivery route planning;
· Proposed an online reinforcement learning agent that tunes the delivery route planning algorithm's hyper-parameters automatically based on recent performance;
· Improved delivery efficiency by 15% compared to the previous algorithm.

Turing Microbe Co.,Ltd Mar. 2019 - Jul. 2019
Advisor: Prof. Wei Xu (IIIS, Tsinghua U) *Computer Vision Research Intern, R&D Department*

· Analysed over 30,000 cases of gynecological diseases data with T-SNE and deep clustering to give doctors insights on new taxonomy for Bacterial Vaginal(BV) diagnosis;
· Used StyleGAN to generate realistic and highly diverse BV pictures for training young doctors;
· Highly recognized by Prof. Qinping Liao, the chairman of the Chinese Medical Doctor Association, the gynecology branch, for insightful data analysis and practical application value of the work.

TEACHING

- TA, CS 6998, Causal Trustworthy AI, Columbia University, Fall/2023.
- TA, DATA 2040, Deep Learning and Special Topics in Data Science, Brown University, Spring/2020.

COMMUNITY SERVICES

- Reviewer, ICLR, 2024.
- Reviewer, NeurIPS, 2023.
- Reviewer, Master's in Computer Science Program Admission (Columbia University), 2023.

AWARDS&HONOURS

10/2018, Scholarship for Academic Achievements, Second Prize (Top 10%)

09/2018, Was selected to appear on the Deans List for the School of Engineering, HKUST

09/2017, The 1st National Student Computer System Capability Challenge, Second Prize (Final 2/70)

05/2017, The 27th "FengRu Cup" University Students Extra-Curricular Scientific and Technological Invention Competition, Second Prize (Final 4/176)