Xueqiao Peng

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Education

Ph.D. in Computer Science and Engineering Sept.2021 – Present
The Ohio State University, Columbus, OH, USA
B.S. Degree in Software Engineering Sept. 2017 – Jun. 2021
University of Electronic Science and Technology of China, Chengdu, China

Skills

Programming	Python, C, Java, Bash
ML Tools	PyTorch, JAX, TensorFlow, Stable Baselines, CleanRL, Spinning Up
Research Area	Reinforcement Learning, Deep Learning, Machine Learning, Public Health

Internship Experience

Hewlett Packard Enterprise (HPE), USA May 2025 – Aug. 2025
AI Research Lab — Research Associate Intern

- Designed a **hierarchical multi-agent RL framework** for carbon-aware datacenter scheduling with a manager–worker architecture.
- Implemented the **simulation environment**, modeling workload scheduling and energy use, and extended it to support hierarchical training.
- Trained **manager and worker agents** using Stable-Baselines3 (PPO, SAC), enabling coordinated yet modular policy learning.
- Evaluated the framework against heuristic baselines, demonstrating improvements in **energy efficiency and carbon-aware workload allocation**.

Research Experience

The Ohio State University, USA May 2022 – Present
Reinforcement Learning Research Assistant (Advisor: Dr. Andrew Perrault)

Hierarchical Multi-Agent RL for Resource-Constrained Epidemic Control

- Formulated the **multi-cluster outbreak resource allocation problem** as a constrained restless multi-armed bandit, capturing the trade-offs between outbreak cost and limited resource availability.
- Developed a **hierarchical RL architecture** with a global PPO coordinator assigning penalty coefficients and local Transformer-enhanced DQNs adapting testing and quarantine strategies.
- Incorporated a **gradient-based regularization mechanism** to enforce monotonicity of Q-values with respect to the penalty coefficient, enhancing interpretability and ensuring compliance with resource constraints.
- Conducted extensive **agent-based epidemic simulations**, demonstrating that the proposed framework outperforms heuristic baselines in both containment effectiveness and resource utilization efficiency.

Multi-Objective Reinforcement Learning for Infectious Disease Control Strategies

- Developed a **Reinforcement Learning(RL)** approach for multi-objective non-pharmaceutical interventions (NPIs) optimization.
- Formulated the problem as a **partially observable Markov decision process (POMDP)** in a simple agent/branching process hybrid.
- Designed a framework that combines **reinforcement learning with supervised learning**, utilizing a permutation-invariant, egocentric state representation. This approach allows for the training and deployment of a generalized agent.
- Contributed to **interpretable policy** development by distilling RL policies into decision trees for real-world applications.

Publications

† → Equal contribution

1. **Xueqiao Peng** & Andrew Perrault. *Optimizing Resource-Constrained Non-Pharmaceutical Interventions in Multi-Cluster Outbreak Control Using Hierarchical Reinforcement Learning* Under review at IJCAI 2026.
2. **Xueqiao Peng**, Jiaqi Xu, Xi Chen, Dinh Song An Nguyen & Andrew Perrault. *Using Reinforcement Learning for Multi-Objective Cluster-Level Optimization of Non-Pharmaceutical Interventions for Infectious Disease* in *Machine Learning for Health (ML4H)* (2023), 445–460.
3. Yi Shi†, **Xueqiao Peng**†, Ruoqi Liu, Anna Sun, Yuedi Yang, Ping Zhang & Pengyue Zhang. An Early Adverse Drug Event Detection Approach with False Discovery Rate Control. *medRxiv: the preprint server for health sciences* (2023).
4. Yuke Wang, Boyuan Feng, **Xueqiao Peng** & Yufei Ding. *An efficient quantitative approach for optimizing convolutional neural networks* in *Proceedings of the 30th ACM International Conference on Information & Knowledge Management* (2021), 2050–2059.
5. Boyuan Feng, Yuke Wang, Xu Li, Shu Yang, **Xueqiao Peng** & Yufei Ding. *Sgquant: Squeezing the last bit on graph neural networks with specialized quantization* in *2020 IEEE 32nd international conference on tools with artificial intelligence (ICTAI)* (2020), 1044–1052.
6. Yan Kuang, Tian Lan, **Xueqiao Peng**, Gati Elvis Selasi, Qiao Liu & Junyi Zhang. Unsupervised multi-discriminator generative adversarial network for lung nodule malignancy classification. *Ieee Access* **8,** 77725–77734 (2020).

Talks

1. **"Using Reinforcement Learning for Multi-Objective Cluster-Level Optimization of Non-Pharmaceutical Interventions"**
   Presented at the 3rd Machine Learning for Health (ML4H) Symposium, New Orleans, USA, 2023.

Academic Service

Review Machine Learning For Health (ML4H), 2024
Review Machine Learning For Health (ML4H), 2025
Review The 40th Annual AAAI Conference on Artificial Intelligence, 2025