YONGSHENG MEI

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SKILLS

Programming	Python, C, C++, MATLAB, Java, Go, R, Verilog
Libraries	PyTorch, TensorFlow, Keras, Scikit-Learn, NumPy, Pandas, Matplotlib
Databases	MySQL, PostgreSQL, Microsoft SQL, NoSQL
Tools	Vim, Git, Linux Bash, PySpark, Jupyter, LaTeX, Visual Studio, Tableau, AWS

EDUCATION

The George Washington University Sept. 2019 – Present
Doctor of Philosophy in Electrical Engineering *Washington, DC, US*
Research Areas: Stochastic Optimization, Reinforcement Learning, Network Security
GPA: 4.00

Huazhong University of Science and Technology Sept. 2015 – June 2019
Bachelor of Engineering in Automation Engineering *Wuhan, Hubei, China*
Relevant Courses: Pattern Recognition, Computer Vision, Control Theory, Computer Architecture
GPA: 3.81

EXPERIENCE

Research Assistant Sept. 2019 - Present
George Washington University, Lab for Intelligent Networking and Computing *Washington, DC, US*

Topic 1: Bayesian Optimization (BO) April 2022 – Present

- Led to develop a gradient-aware BO framework to **determine local optimal solutions** in multimodal unknown functions for hyperparameter tuning when using the optimal solution is not physically available.
- Led to develop a BO model for Gaussian Cox process on discrete **spatial/time series data** to **estimate arrival intensity** (outperforming baselines in 7 out of 9 settings) and **detect regions of interest** based on estimations. This work is published at **ICLR** 2024.

Topic 2: Reinforcement Learning (RL) Aug. 2020 – Present

- Led a project, **MAC-PO**, to develop an optimized **collective prioritized experience replay scheme** in off-policy multi-agent RL via the prioritization weights assignment. Experiments show that rewards of MAC-PO outperform other baseline algorithms by up to 10%.
- Led a project, **AccMER**, to develop a **data-reuse strategy** in conjunction with experience replay to accelerate the multi-agent RL, where the end-to-end training time reduction is 25.4% (for 32 agents).

Topic 3: Multimodal Medical Image Segmentation Feb. 2021 – Dec. 2022

- Led to develop a multimodal image segmentation model for brain tumor MRI data. The framework can improve the accuracy via **self-attention** with extracted correlated **common information microstructures** among modalities. The method achieves 92% accuracy for whole tumor on the BraTS-2020 dataset.

Topic 4: Network Security via Protocol Customization Sept. 2019 – Aug. 2021

- Led a project, **MPD**, to develop a reliable **self-synchronizing moving target defense** model via customized network and Internet of Things protocols. The system can defend common attacks, such as MITM and DoS.

Visiting Researcher June 2023 – Aug. 2023
Purdue University, Intelligence Optimization for Networks Lab *West Lafayette, IN, US*

Led to develop a **continual federated learning** model with time-variant input of each edge device. The model uses the **diffusion model** to generate synthetic data to avoid catastrophic forgetting problems during learning.

Electronic Engineer Intern Feb. 2017 – Aug. 2017
HUST Electrical and Electronic Technology Innovation Center *Wuhan, Hubei, China*

Led the printed circuit board design and FPGA programming for an adaptive signal filter and won the **Runner-Up Prize** in the 2017 National Undergraduate Electronic Design Contest.

PUBLICATIONS

1. **Yongsheng Mei**, Mahdi Imani, and Tian Lan, *Bayesian Optimization through Gaussian Cox Process Models for Spatio-temporal Data*, International Conference on Learning Representations (ICLR), May 2024. [PDF]
2. **Yongsheng Mei**, Hanhan Zhou, and Tian Lan, *Projection-Optimal Monotonic Value Function Factorization in Multi-Agent Reinforcement Learning*, International Conference on Autonomous Agents and Multiagent Systems (AAMAS), May 2024. [PDF]
3. Yurong Chen, **Yongsheng Mei**, Tian Lan, and Guru Venkataramani, *Exploring Effective Fuzzing Strategies to Analyze Communication Protocols*, ACM Digital Threats: Research and Practice, March 2024. [PDF]
4. **Yongsheng Mei**, Tian Lan, Mahdi Imani, and Suresh Subramaniam, *A Bayesian Optimization Framework for Finding Local Optima in Expensive Multi-Modal Functions*, European Conference on Artificial Intelligence (ECAI), September 2023. [PDF]
5. **Yongsheng Mei**, Tian Lan, and Guru Venkataramani, *Exploiting Partial Common Information Microstructure for Multi-Modal Brain Tumor Segmentation*, ICML workshop on Machine Learning for Multimodal Healthcare Data (ML4MHD), July 2023. [PDF]
6. Kailash Gogineni, **Yongsheng Mei**, Peng Wei, Tian Lan, and Guru Venkataramani, *AccMER: Accelerating Multi-agent Experience Replay with Cache Locality-aware Prioritization*, IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP), July 2023. [PDF]
7. **Yongsheng Mei**, Hanhan Zhou, Tian Lan, Guru Venkataramani, and Peng Wei, *MAC-PO: Multi-Agent Experience Replay via Collective Priority Optimization*, International Conference on Autonomous Agents and Multiagent Systems (AAMAS), June 2023. [PDF]
8. Kailash Gogineni, **Yongsheng Mei**, Guru Venkataramani, and Tian Lan, *Verify-Pro: A Framework for Server Authentication Using Communication Protocol Dialects*, IEEE Military Communications Conference (MILCOM), September 2022. [PDF]
9. **Yongsheng Mei**, Kailash Gogineni, Tian Lan, and Guru Venkataramani, *MPD: Moving Target Defense through Communication Protocol Dialects*, International Conference on Security and Privacy in Communication Networks (SecureComm), September 2021. [PDF]
10. Hongfa Xue, **Yongsheng Mei**, Kailash Gogineni, Guru Venkataramani, and Tian Lan, *Twin-Finder: Integrated Reasoning Engine for Pointer-related Code Clone Detection*, International Workshop on Software Clones (IWSC), February 2020. [PDF]

PRESENTATIONS

GW 2024 Global Business & Policy Forum poster session *April 2024, Washington, DC, US*

ICML 2023 Machine Learning for Multimodal Healthcare Data workshop *July 2023, Honolulu, HI, US*

Presenting to the Office of Naval Research on the protocol customization project *Feb. 2022, Online*

EAI 17th International Conference on Security and Privacy in Communication Networks *Sept. 2021, Online*

Hosting TPCP 2020 Software Security Summer School *Aug. 2020, Online*

IEEE 14th International Workshop on Software Clones *Feb. 2020, London, ON, Canada*

AWARDS

2023 European Conference on Artificial Intelligence *Call to Arms* Award.

2020, 2021, 2022 GW University Fellowship

2019 HUST Outstanding Graduates

2017 Runner-Up Prize in National Undergraduate Electronic Design Contest.