CURRICULUM VITAE

Lei Zhao

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Education

Ph.D. University of Victoria, Victoria, BC, Canada　　　　　　　　October 2023

    Areas: Efficient Machine Learning, Federated Learning, Signal Processing

    Supervisor: Professor Lin Cai

    Co-Supervisor: Professor [Wu-Sheng Lu]

M.E. Xidian University, Xi'an, China　　　　　　　　　　　　　　July 2018

    Major: Computer Systems and Architecture

B.E. Xidian University, Xi'an, China　　　　　　　　　　　　　　July 2015

    Major: Computer Science and Technology

Work Experience

Post-Doctoral. University of Victoria　　　　　　　　　　Oct. 2023 ~ Dec. 2024

    Areas: Efficient Machine Learning, Federated Learning, Deep Hedging

    Supervisor: Professor [Lin Cai]

Research Interests

- Advanced Optimization Techniques in Machine Learning
- Efficient and Scalable Federated Learning Solutions in Finance
- Explainable AI in Financial Decision-Making
- Dynamic Hedging Strategies Using Deep Learning
- Efficient Model Approximation in Finance
- Quantitative Risk Management for Financial Systems
- Exploration of Training Dynamics in Financial Models via Hilbert Space
- Sketch Learning Empowered Kernel Design for Financial Data Analysis

Teaching Experience

Instructor, University of Victoria, BC, Canada　　　　　　Sept. 2019 – Dec. 2024

Optimization for Machine Learning (ECE 403/ECE 503)

I have taught this course seven times from September 2019 to December 2024, at the request of the Department, driven by consistently positive student feedback. My teaching excellence has been recognized with two Excellence in Teaching Awards and a nomination for the Faculty of Engineering and Computer Science Excellence in Teaching Award. This course is cross listed for both undergraduate and graduate students, highlighting its broad academic impact.

Honors and Awards

1. Second Prize, Collaborative Innovation Scholarship, China Electronics Technology Group Corporation - Xidian University 2017
2. National Scholarship for Master's Students 2017
3. Special Award for Outstanding Graduation Thesis, School of Computer Science, Xidian University 2018
4. Excellence in Teaching Award 2020
5. Excellence in Teaching Award 2021
6. Nomination for the Faculty of Engineering and Computer Science Excellence in Teaching Award 2023
7. Nominations for the Governor General's Gold Medal 2023

Publications

Published Papers

[1] **Lei Zhao**, Lin Cai, and Wu-Sheng Lu, "Tailored Federated Learning with Adaptive Central Acceleration on Diversified Global Models", IEEE Transactions on Neural Networks and Learning Systems, DOI: 10.1109/TNNLS.2024.3487873.

[2] **Lei Zhao**, Lin Cai, and Wu-Sheng Lu, "Accelerating Federated Learning for Edge Intelligence using Conjugation with Inexact Global Line Search", IEEE Transactions on Cognitive Communications and Networking, DOI: 10.1109/TCCN.2024.3454273.

[3] **Lei Zhao**, Lin Cai, and Wu-Sheng Lu, "Federated Learning for Data Trading Portfolio Allocation with Autonomous Economic Agents", IEEE Transactions on Neural Networks and Learning Systems, DOI: 10.1109/TNNLS.2023.3332315.

[4] **Lei Zhao**, Lin Cai, and Wu-Sheng Lu, "Collaborative Learning of Different Types of Healthcare Data from Heterogeneous IoT Devices", IEEE Internet of Things Journal, vol. 11, no. 4, pp. 5757 - 5769, 2024.

[5] **Lei Zhao**, Lin Cai, and Wu-Sheng Lu, "Transform-Domain Federated Learning for Edge-Enabled IoT Intelligence." IEEE Internet of Things Journal, vol. 10, no. 7, pp. 6205-6220, 2022.

[6] **Lei Zhao**, Xiaolong Lan, Lin Cai, and Jianping Pan, "Adaptive Content Placement in Edge Networks Based on Hybrid User Preference Learning," *Proc. IEEE GLOBECOM*, 2019.

[7] **Lei Zhao**, Jiadai Wang, Jiajia Liu, and Nei Kato, "Routing for Crowd Management in Smart Cities: A Deep Reinforcement Learning Perspective," *IEEE Communications Magazine*, vol. 57, no. 4, pp. 88-93, 2019.

[8] **Lei Zhao**, Jiadai Wang, Jiajia Liu, and Nei Kato, "Optimal Edge Resource Allocation in IoT-Based Smart Cities," *IEEE Network*, vol. 33, no. 2, pp. 30-35, 2019.

[9] Jiadai Wang, **Lei Zhao**, Jiajia Liu, and Nei Kato, "Smart Resource Allocation for Mobile Edge Computing: A Deep Reinforcement Learning Approach," *IEEE Transactions on Emerging Topics in*

Computing, vol. 9, no. 3, pp. 1529-1541, 2021.

[10] **Lei Zhao** and Jiajia Liu, "Optimal placement of virtual machines for supporting multiple applications in mobile edge networks," *IEEE Transactions on Vehicular Technology*, vol. 67, no. 7, pp. 6533-6545, 2018.

[11] **Lei Zhao**, Wen Sun, Yongpeng Shi, and Jiajia Liu, "Optimal placement of cloudlets for access delay minimization in SDN-based internet of things networks," *IEEE Internet of Things Journal*, vol. 5, no. 2, pp. 1334-1344, 2018.

[12] Jiajia Liu, Yongpeng Shi, **Lei Zhao**, Yurui Cao, Wen Sun, and Nei Kato, "Joint placement of controllers and gateways in SDN-enabled 5G-satellite integrated network," *IEEE Journal on Selected Areas in Communications*, vol. 36, no. 2, pp. 221-232, 2018.

[13] Yurui Cao, **Lei Zhao**, Yongpeng Shi, and Jiajia Liu, "Gateway Placement for Reliability Optimization in 5G-Satellite Hybrid Networks," *Proc. IEEE ICNC*, 2018, pp. 372-376.

[14] Hongzhi Guo, Jiajia Liu, and **Lei Zhao**, "Big data acquisition under failures in FiWi enhanced smart grid," *IEEE Transactions on Emerging Topics in Computing*, vol. 7, no. 3, pp. 420-432, 2019.

[15] Jiajia Liu, Hongzhi Guo, and **Lei Zhao**, "Resilient and low-latency information acquisition for FiWi enhanced smart grid," *IEEE Network*, vol. 31, no. 5, pp. 80-86, 2017.

[16] **Lei Zhao**, Jiajia Liu, Yongpeng Shi, Wen Sun, and Hongzhi Guo, "Optimal placement of virtual machines in mobile edge computing," *Proc. IEEE GLOBECOM*, 2017, pp. 1-6.

Papers in Submission and Revision

[1] **Lei Zhao**, Lin Cai, and Wu-Sheng Lu, "Federated Learning with Efficient Local Adaptation for Realized Volatility Prediction", submitted to Transactions on Machine Learning Research.

[2] **Lei Zhao**, and Lin Cai, "Robust and Explainable Derivative Hedging with Linearized Neural Network", submitted to Transactions on Machine Learning Research.

[3] **Lei Zhao**, Lin Cai, and Wu-Sheng Lu, "Efficient Dynamic Vega Hedging with Adaptive Nesterov Acceleration", under revision and submitting to IEEE Transactions on Neural Networks and Learning Systems.

[4] **Lei Zhao**, Wu-Sheng Lu, and Lin Cai, "Central Acceleration for Federated Optimization with Stochastic and Deterministic Client Selection", under revision and resubmit to IEEE Transactions on Pattern Analysis and Machine Intelligence.

Papers in Preparation

[1] **Lei Zhao**, Lin Cai, and Wu-Sheng Lu, "Robust Hedging Risk Management with Efficient Federated Optimization".

Editorial Activities

Review Editor for Frontiers in Communications and Networks, 2020 – Present

References

Professor Lin Cai
Email: cai@ece.uvic.ca
Fellowships and Recognitions: Fellow of the Royal Society of Canada, NSERC Steacie Fellow, EIC Fellow, CAE Fellow, Fellow of IEEE
Webpage: https://www.ece.uvic.ca/~cai/

Professor Wu-Sheng Lu
Email: wslu@ece.uvic.ca
Fellowships and Recognitions: Life Fellow of IEEE
Webpage: https://www.ece.uvic.ca/~wslu/