

Zhiyuan LIU

Software Engineer, Google
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[Google Scholar](#) and [Personal Website](#)

RESEARCH AREA

Online learning, distributed algorithm design and analysis, optimization and its engineering applications, game theory.

EDUCATION

University of Colorado, Boulder. Aug. 2015 - May 2021
Ph.D in Computer Science

University of Colorado, Boulder. Aug. 2015 - Dec. 2020
Master in Computer Science

University of Science and Technology of China. Aug. 2011 - May 2015
Bachelor of Computer Science

EXPERIENCE

Software Engineer, Google May. 2021 - Now
Node Performance and Power teams in Borglet
- Improves task performance for Google Cloud.
- Reduces Google's data center costs through increased infrastructure utilization and efficiency.
- designs and implements mechanisms to handle the emergency power issues.

Software Engineer, YouTube Jun. 2021 - May. 2022
Viewer Interest Exploration and New User Onboarding.
- Designed systems and algorithms for recommendation Shorts to new users.
- Investigated users' interest space and designed algorithms for Shorts' users.

Research Intern, Pacific Northwest National Laboratory Jun. 2018 - Aug. 2018
Convergence of Koopman Learning and Distributed Algorithms.
- Used deep neural networks to alternatively learn the function space and linear operator.

Research Intern, Pacific Northwest National Laboratory Jul. 2017 - Aug. 2017
Koopman Learning for Control and Model Decomposition.
- Used deep neural networks to alternatively learn the function space and linear operator.

PUBLICATIONS

[1] **Towards Scalable Koopman Operator Learning: Convergence Rate and a Distributed Learning Algorithm.**

Zhiyuan Liu, Guohui Ding, Lijun Chen, Enoch Yeung.
Proceedings of the American Control Conference (ACC), 2020.

[2] **Reverse and Forward Engineering of Local Voltage Control in Distribution Networks.**

Xinyang Zhou, Masoud Farivar, Zhiyuan Liu, Lijun Chen, Steven Low.

IEEE Transactions on Automatic Control, 2020.

[3] Incentivized Exploration for Multi-Armed Bandits under Reward Drift.

Zhiyuan Liu, Huazheng wang, Fan Shen, Kai Liu, Lijun Chen.

Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI), 2020.

[4] Multi-Level Optimal Power Flow Solver in Large Distribution Networks.

Xinyang Zhou, Yue Chen, Zhiyuan Liu, Changhong Zhao, Lijun Chen.

IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), 2020.

[5] A Smoothed Analysis of Online Lasso for the Sparse Linear Contextual Bandit Problem.

Zhiyuan Liu, Huazheng Wang, Bo Waggoner, Youjian (Eugene) Liu, Lijun Chen.

ICML Real Active Learning Workshop, 2020.

[6] Gradient-Based Multi-Area Distribution System State Estimation.

Xinyang Zhou, Zhiyuan Liu, Yi Guo, Changhong Zhao, Lijun Chen.

IEEE Transactions on Smart Grid, 2020.

[7] Distributed Online Convex Programming for Collision Avoidance in Multi-agent Autonomous Vehicle Systems.

Guohui Ding, Hadi Ravanbakhsh, Zhiyuan Liu, Sriram Sankaranarayanan, Lijun Chen.

Proceedings of the American Control Conference (ACC), 2020.

[8] Accelerated Voltage Regulation in Multi-Phase Distribution Networks Based on Hierarchical Distributed Algorithm.

Xinyang zhou, Zhiyuan Liu, Changhong Zhao, Lijun Chen.

IEEE Transactions on Power Systems, 2019.

[9] Decomposition of Nonlinear Dynamical Systems Using Koopman Gramians.

Zhiyuan Liu, Soumya Kundu, Lijun Chen, Enoch Yeung.

Proceedings of the American Control Conference (ACC), 2018.

[10] A koopman operator approach for computing and balancing gramians for discrete time nonlinear systems .

Enoch Yeung, Zhiyuan Liu, Nathan O Hodas.

Proceedings of the American Control Conference (ACC), 2018.

[11] Block Belief Propagation for Parameter Learning in Markov Random Fields.

Lu You, Zhiyuan Liu, Bert Huang.

Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence (AAAI), 2019.

[12] Signal-anticipation in local voltage control in distribution systems.

Zhiyuan Liu, Seungil You, Xinyang Zhou, Guohui Ding, Lijun Chen.

IEEE Transactions on Smart Grid, 2018.

[13] Hierarchical Distributed Voltage Regulation in Networked Autonomous Grids.

Xinyang Zhou*, Zhiyuan Liu*, Wenbo Wang, Changhong Zhao, Fei Ding, Lijun Chen.

Proceedings of the American Control Conference (ACC), 2019.

* equal contribution.

[14] Stochastic Dual Algorithm for Voltage Regulation in Distribution Networks with Discrete Loads.

Xinyang Zhou, Zhiyuan Liu, Emiliano Dall'Anese, Lijun Chen.

IEEE International Conference on Smart Grid Communications (SmartGrid), 2017.

[15] Proportional Control Applied to Dynamic Network Resource Allocation.

Zhiyuan Liu, Lijun Chen.

Proceedings of the American Control Conference (ACC) 2017.

[16] A Nonconvex Relaxation Approach for Rank Minimization Problems.

Xiaowei Zhong, Linli Xu, Yitan Li, **Zhiyuan Liu**, Enhong Chen.

Proceedings of the Thirty- AAAI Conference on Artificial Intelligence(AAAI), 2015.

[17] Incentivizing Exploration in Linear Bandits under Information Gap.

Huazheng Wang, Haifeng Xu, Chuanhao Li, **Zhiyuan Liu**, Hongning Wang (Under Review)

[18] Self-Interested Behaviors and Coping Strategies in Learning and Control Systems.

Zhiyuan Liu (Ph.D Thesis)

PATENT

Hierarchical distributed voltage regulation.

Inventors: Xinyang Zhou, Changhong Zhao, **Zhiyuan Liu**, Lijun Chen.

Patent No.: US 11228180B2, Date of Patent: Jan. 18, 2022

AWARDS

Departmental Summer Research Fellowship (2020), AAAI Student Travel Award (2020), ACC Student Travel Award (2017, 2020), PhD Student Fellowship (2015), Outstanding Student Scholarship(USTC) (2011-2015), Industrial Bank Responsibility Scholarship (2012).

PROFESSIONAL SERVICES

Reviewer: ICML(2021), Transactions on Power Systems(TSP)(2021), ICLR(2021,2022,2023), NeurIPS(2020), AAAI(2020), ACC(2019,2020), TAC(2019, 2020), CDC(2018,2019,2020,2021), Transactions on Signal Processing(TSP)(2020), IEEE SmartGridComm (2020),

PRESENTATIONS

[1] Presentation entitled “**Decomposition of nonlinear dynamical systems using koopman gramians**” at American control conference, June 28, 2018, Milwaukee.

[2] Poster presentation entitled “**Incentivized exploration for multi-armed bandits under reward drift**” at Thrity-Fourth AAAI Conference on Artificial intelligence, Feb 08, 2020, New York.

[3] Presentation entitled “**Proportional control applied to dynamic network resource allocation**” at American control conference, May 25, 2017, Seattle.

[4] Poster presentation entitled “**Towards scalable Koopman operator learning: Convergence rates and a distributed learning algorithm**” at American control conference, July 2, 2020, Denver. Virtual conference due to COVID-19.

[5] Poster presentation entitled “**A Smoothed Analysis of Online Lasso for the Sparse Linear Contextual Bandit Problem**” ICML workshop on Real World Experiment Design and Active Learning July 18, 2020. Virtual conference due to COVID-19.