

Guanchu Wang

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OBJECTIVE

I will be on the job market in Fall 2024 seeking academic positions.

RESEARCH INTERESTS

- **Large Language Model:** Compression and Acceleration of Large Language Models
- **Efficient ML:** ML Acceleration, Memory Efficient Training, Quantization
- **Explainable AI:** Post-hoc Explanation, Amortized Explanation, Real-time explanation
- **AI for Science:** Bio-informatics, Wireless communication

EDUCATIONAL BACKGROUND

- Rice University Ph.D., Computer Science Aug. 2020 - May 2025 (expected)
– Advisor: Dr. Xia “Ben” Hu
- University of Science and Technology of China M.S., Computer Science Sep 2016 - May 2019
– Advisor: Dr. Chen Gong and Dr. Zhengyuan Xu

RESEARCH EXPERIENCE

- Graduate research assistant, Rice University, Houston Aug 2021 - present
 - Large language models.
 - * One Publication in *NeurIPS 2023*.
 - Efficient machine learning.
 - * Two Publications in *ICML 2023*, and *CIKM 2022 (BEST DEMO AWARD)*.
 - Explainable machine learning, Fairness in deep learning.
 - * Four Publications in *NeurIPS 2023*, *ECML-PKDD 2023*, *ICLR2023*, and *ICML 2022*.
 - AI for science: Bio-informatics, Wireless communication.
 - * Two Publications in *CIKM 2022* and *JOCN 2023*.
 - Demo work on efficient ML: *BED: A Real-Time Object Detection System for Edge Devices*.
 - * Configuration: a *MAX78000* micro-controller as CPU, and a camera and a screen as IO devices.
 - * Novelty: Efficient on-chip inference (300KB DNN model, 1.845 mJ power, and 91.9 ms time per sample).
 - * Dependencies: *MAX78000* AI Micro-controller, *ai8x-training*, *ai8x-synthesis*, *Pytorch*, *PyQt* (for GUI).
- Graduate research assistant, Texas A&M University, College Station Feb 2020 - July 2021
 - Fairness in deep learning.
 - * Three publications in *AAAI 2021*, and *NeurIPS 2021*.
 - Opensource Package: *TODS: An Automated Time Series Outlier Detection System*. (1k+ star, 150+ fork)
 - * Functionality: Data preprocessing, feature engineering, and Point/Time-series/System anomaly detection.
 - * Novelty: Automated pipeline search and hyper-parameter tuning.
 - * User Interface: *Sk-learn* interface, data visualization and graphical user interface (GUI).
 - * Dependencies: *D3M*, *sklearn*, *Pyod*, *PyQt* (for GUI), *Keras* (for deep AD).
- Research assistant, Westlake University, Zhejiang, P.R.C Aug 2019 - Jan 2020
 - Deep reinforcement learning for robotic controlling.
 - * Two publications in *IJCAI 2020*, and *IJCNN 2021*.
- Graduate research assistant, University of Science and Technology of China, Anhui, P.R.C Sep 2016 - May 2019

- *Wireless communication algorithms and protocols, and FPGA platform of UV communication system.*
- * *Two publications in Globecom 2017, and ICC 2018.*
- * *Four publications in PJ 2018, TCOM 2018, PJ 2019, and TCOM 2021.*

PUBLICATIONS

Preprints

- [P1] Chia-Yuan Chang, Yu-Neng Chuang, **Guanchu Wang**, Mengnan Du, Na Zou. "DISPEL: Domain Generalization via Domain-Specific Liberating."
- [P2] Yao Rong, **Guanchu Wang**, Qizhang Feng, Ninghao Liu, Zirui Liu, Enkelejda Kasneci and Xia Hu. "Efficient GNN Explanation via Learning Removal-based Attribution."
- [P3] Yu-Neng Chuang, **Guanchu Wang**, Fan Yang, Zirui Liu, Xuanting Cai, Mengnan Du, and Xia Hu. "Efficient XAI Techniques: A Taxonomic Survey."

Conference Publications

- [C1] **Guanchu Wang***, Zirui Liu*, Shaochen Zhong, Zhaozhuo Xu, Daochen Zha, Ruixiang Tang, Zhimeng Jiang, Kaixiong Zhou, Vipin Chaudhary, Shuai Xu and Xia Hu. "Winner-Take-All Column Row Sampling for Memory Efficient Adaptation of Language Model." Neural Information Processing Systems, NeurIPS 2023.
- [C2] Zhimeng Jiang, Xiaotian Han, Hongye Jin, **Guanchu Wang**, Rui Chen, Na Zou, Xia Hu. "Chasing Fairness under Distribution Shift: a Model Weight Perturbation Approach." Neural Information Processing Systems, NeurIPS 2023.
- [C3] Yu-neng Chuang, **Guanchu Wang**, Chia-Yuan Zhang, Kwei-Herng Lai, Ruixiang Tang, Fan Yang, Alfredo Costilla-Reyes, Kaixiong Zhou, Xiaoqian Jiang and Xia Hu. "DiscoverPath: A Knowledge Refinement and Retrieval System for Interdisciplinarity on Biomedical Research." International Conference on Information and Knowledge Management, CIKM 2023, Demo Track.
- [C4] **Guanchu Wang**, Mengnan Du, Ninghao Liu, Na Zou and Xia Hu. "Mitigating Algorithmic Bias with Limited Annotations." European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, ECML-PKDD 2023.
- [C5] **Guanchu Wang**, Zirui Liu, Zhimeng Jiang, Ninghao Liu, Na Zou and Xia Hu. "DIVISION: Memory Efficient Training via Dual Activation Precision." International Conference on Machine Learning, ICML 2023.
- [C6] **Guanchu Wang***, Yu-Neng Chuang*, Fan Yang, Quan Zhou, Pushkar Tripathi, Xuanting Cai and Xia Hu. "CoRTX: Contrastive Learning for Real-time Explanations." International Conference on Learning Representations, ICLR 2023.
- [C7] **Guanchu Wang***, Zaid Pervaiz Bhat*, Zhimeng Jiang*, Yi-Wei Chen*, Daochen Zha*, Alfredo Costilla Reyes*, et al. "BED: A Real-Time Object Detection System for Edge Devices." International Conference on Information and Knowledge Management, CIKM 2022, Demo Track, **BEST PAPER AWARD**.
- [C8] **Guanchu Wang***, Yu-Neng Chuang*, Mengnan Du, Fan Yang, Quan Zhou, Pushkar Tripathi, Xuanting Cai and Xia Hu. "Accelerating Shapley Explanation via Contributive Cooperator Selection." International Conference on Machine Learning, ICML 2022.
- [C9] Mengnan Du, Subhabrata Mukherjee, **Guanchu Wang**, Ruixiang Tang, Ahmed Hassan Awadallah, and Xia Hu, "Fairness via Representation Neutralization." Neural Information Processing Systems, NeurIPS 2021.
- [C10] Kwei-Herng Lai, Daochen Zha, Junjie Xu, Yue Zhao, **Guanchu Wang**, and Xia Hu, "Revisiting Time Series Outlier Detection: Definitions and Benchmarks." Neural Information Processing Systems, NeurIPS 2021.
- [C11] Qiangxing Tian, Jinxin Liu, **Guanchu Wang**, and Donglin Wang, "Learning Transitional Skills with Intrinsic Motivation." International Joint Conference on Neural Networks, IJCNN 2021.

- [C12] Kwei-Herng Lai*, Daochen Zha*, **Guanchu Wang**, Junjie Xu, Yue Zhao, Devesh Kumar, Yile Chen, Purav Zumkhawaka, Minyang Wan, Diego Martinez, Xia Hu, "TODS: An Automated Time Series Outlier Detection System." AAAI Conference on Artificial Intelligence, demo track, AAAI 2021.
- [C13] Qiangxing Tian, **Guanchu Wang**, Jinxin Liu, and Donglin Wang, "Independent Skill Transfer for Deep Reinforcement Learning." International Joint Conference on Artificial Intelligence, IJCAI 2020.
- [C14] **Guanchu Wang**, Chen Gong, Zhimeng Jiang, et al. "Signal Characterization for Multiple Access Non-line of Sight Scattering Communication." IEEE International Conference on Communications, ICC 2018.
- [C15] **Guanchu Wang**, Chen Gong, et al. "Signal detection and achievable rates for multiple access optical wireless scattering communication." IEEE Global Communication Conference, Globecom 2017.

Journal Publications

- [J1] Yuchen Pan, **Guanchu Wang**, Yubo Zhang, Jingyin Tang, Chen Gong, and Zhengyuan Xu. "Graph-based Conflict-free MAC Protocol and Conflict Analysis for Two-layer Ultraviolet Communication Network." IEEE Journal of Optical Communications and Networking, JOCN 2023.
- [J2] Zhimeng Jiang, Chen Gong, **Guanchu Wang**, and Zhengyuan Xu. "On the sum-rate capacity of poisson multiple access channel with non-perfect photon-counting receiver." Journal of Communications and Information Networks, JCIN 2020.
- [J3] Zhimeng Jiang, Chen Gong, **Guanchu Wang**, and Zhengyuan Xu. "On the Achievable Rate and Capacity for a Sample-based Practical Photon-counting Receiver." IEEE Transaction on Communication, TCOM 2021.
- [J4] **Guanchu Wang**, Chen Gong, Zhimeng Jiang, and Zhengyuan Xu. "Multi-layer Superimposed Transmission for Optical Wireless Scattering Communication." IEEE Photonics Journal, PJ 2019.
- [J5] **Guanchu Wang**, Chen Gong, and Zhengyuan Xu, "Signal Characterization for Multiple Access Non-line of Sight Scattering Communication." IEEE Transaction on Communication, TCOM 2018.
- [J6] **Guanchu Wang**, Kun Wang, Chen Gong, and Zhengyuan Xu. "A 1Mbps Real-time NLOS UV Scattering Communication System with Receiver Diversity over 1km." IEEE Photonics Journal, PJ 2018.

TEACHING

- Spring 2022: Machine Learning with Graph, Teaching assistance, Rice University, USA.
- Spring 2023: Introduction to Information Retrieval, Teaching assistance, Rice University, USA.
- Fall 2018: Matrix Analysis, Teaching assistance, University of Science and Technology of China, PRC.