

Guanchu Wang

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OBJECTIVE

To look for an intern position.

RESEARCH INTERESTS

- **Explainable Machine Learning:** Post-hoc explanation, Learn to Explain, Real-time Interpretation, Shapley value
- **Fairness in Deep Learning:** Bias Mitigation, Shortcut Learning, Social Good
- **Anomaly Detection:** Anomaly Detection, Time-series Anomaly Detection, Deep Anomaly Detection
- **Others:** Compression of Deep Learning, Acceleration, Deep Reinforcement Learning

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
- Dalian University of Technology B.S., Communication Engineering Sep 2012 - May 2016
– GPA: Top 2% among 400+ students

RESEARCH EXPERIENCE

- Graduate research assistant, Rice University, Houston Aug 2021 - present
 - Explainable machine learning, compression of deep learning.
 - * Two conference publications in ICML 2022, and CIKM 2022.
 - Demo work: 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 conference publications in AAAI 2021, and NIPS 2021.
 - Opensource Package: TODS: An Automated Time Series Outlier Detection System. (500+k star, 90+ 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 conference 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 conference publications in Globecom 2017, and ICC 2018.
- * Four journal publications in PJ 2018, TCOM 2018, PJ 2019, and TCOM 2021.

PUBLICATIONS

Conference Publications

- [C1] **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
- [C2] **Guanchu Wang***, Yu-Neng Chuang*, Mengnan Du, Fan Yang, Quan Zhou, Pushkar Tripathi, Xuanning Cai and Xia Hu. "Accelerating Shapley Explanation via Contributive Cooperator Selection." International Conference on Machine Learning, ICML 2022.
- [C3] Mengnan Du, Subhabrata Mukherjee, **Guanchu Wang**, Ruixiang Tang, Ahmed Hassan Awadallah, and Xia Hu, "Fairness via Representation Neutralization." Neural Information Processing Systems, NeurIPS 2021.
- [C4] 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.
- [C5] Qiangxing Tian, Jinxin Liu, **Guanchu Wang**, and Donglin Wang, "Learning Transitional Skills with Intrinsic Motivation." International Joint Conference on Neural Networks, IJCNN 2021.
- [C6] Kwei-Herng Lai*, Daochen Zha*, **Guanchu Wang**, Junjie Xu, Yue Zhao, Devash 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.
- [C7] Qiangxing Tian, **Guanchu Wang**, Jinxin Liu, and Donglin Wang, "Independent Skill Transfer for Deep Reinforcement Learning." International Joint Conference on Artificial Intelligence, IJCAI 2020.
- [C8] **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.
- [C9] **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] Zhimeng Jiang, Chen Gong, **Guanchu Wang**, et al. "On the Achievable Rate and Capacity for a Sample-based Practical Photon-counting Receiver." IEEE Transaction on Communication, TCOM 2021.
- [J2] **Guanchu Wang**, Chen Gong, Zhimeng Jiang, et al. "Multi-layer Superimposed Transmission for Optical Wireless Scattering Communication." IEEE Photonics Journal, PJ 2019.
- [J3] **Guanchu Wang**, Chen Gong, and Zhengyuan Xu, "Signal Characterization for Multiple Access Non-line of Sight Scattering Communication." IEEE Transaction on Communication, TCOM 2018.
- [J4] **Guanchu Wang**, Kun Wang, Chen Gong, et al. "A 1Mbps Real-time NLOS UV Scattering Communication System with Receiver Diversity over 1km." IEEE Photonics Journal, PJ 2018.

TECHNICAL SKILLS

- Coding: Python (Pytorch, Keras, Sklearn, Pyod, Gym), Matlab, C++ ($\leq C++11$), Verilog (ISE).
- Mathematics: Calculus, statistics, optimization, matrix analysis, Complex analysis, Signal processing.
- Teamwork: Collaboration (Github, Gitlab), teamwork (Slack, MS Team, Zoom), paper writing (latex, overleaf).