GUANCHU (GARY) WANG

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RESEARCH INTERESTS

Trustworthy Machine Learning: Deep Neural Network Interpretations, Real-time Interpretation, Foundational Explainers, Machine Learning Fairness.

Trustworthy Large Language Models: Large Language Model Interpretation, Large Language Model Security, Retrieval-Augmented Generation.

Artificial Intelligence for Healthcare: Large Language Models for Rare Disease Diagnosis.

EDUCATION

Rice University   *Aug 2020 - May 2025 (expected)*
Ph.D. candidate in Computer Science
Advisor: Dr. Xia (Ben) Hu

University of Science and Technology of China   *Sep 2016 - May 2019*
M.S. in Computer Science
Advisor: Dr. Chen Gong and Dr. Zhengyuan Xu

Dalian University of Technology   *Sep 2012 - May 2016*
B.S. in Electronic Engineering

PUBLICATIONS

Hightlights:

12 papers are published as the first author on top venues.
24 papers have been published and garnered 600 citations.
ICML'22 Spotlight, CIKM'22 Best Demo Award, CIKM'23 Best Demo Honorable Mention.

Conference Publications: (∗ denotes equal contributions)

1. [EMNLP' 24] **Guanchu Wang***, Yu-Neng Chuang*, Ruixiang Tang, Shaochen Zhong, Jiayi Yuan, Hongye Jin, Zirui Liu, Vipin Chaudhary, Shuai Xu, James Caverlee, Xia Hu "Secured Weight Release for Large Language Models via Taylor Expansion."

2. [EMNLP' 24] Jiayi Yuan*, Hongyi Liu*, Shaochen Zhong*, Yu-Neng Chuang*, Songchen Li,**Guanchu Wang**, Duy Le, Hongye Jin, Vipin Chaudhary, Zhaozhuo Xu, Zirui Liu, Xia Hu "KV Cache Compression, But What Must We Give in Return? A Comprehensive Benchmark of Long Context Capable Approaches."

3. [NeurIPS' 24] Yu-Neng Chuang, **Guanchu Wang**, Chia-Yuan Chang, Ruixiang Tang, Shaochen Zhong, Fan Yang, Mengnan Du, Xuanting Cai, Xia Hu "FaithLM: Towards Faithful Explanations for Large Language Models."

4. [ICML' 24] **Guanchu Wang**, Yu-Neng Chuang, Fan Yang, Mengnan Du, Chia-Yuan Chang, Shaochen Zhong, Zirui Liu, Zhaozhuo Xu, Kaixiong Zhou, Xuanting Cai, Xia Hu "TVE: Learning Meta-attribution for Transferable Vision Explainer."

5. [NeurIPS' 23] **Guanchu Wang***, Zirui Liu*, Shaochen Zhong, Zhaozhuo Xu, Daochen Zha, Ruixiang Tang, Zhimeng Jiang, Kaixiong Zhou, Vipin Chaudhary, Shuai Xu, Xia Hu "Winner-Take-All Column Row Sampling for Memory Efficient Adaptation of Language Model."

6. **[NeurIPS' 23]** Zhimeng Jiang, Xiaotian Han, Hongye Jin, **Guanchu Wang**, Rui Chen, Na Zou, Xia Hu." Chasing Fairness under Distribution Shift: a Model Weight Perturbation Approach."

7. **[CIKM' 23]** Yu-neng Chuang, **Guanchu Wang**, Chia-Yuan Zhang, Kwei-Herng Lai, Ruixiang Tang, Fan Yang, Alfredo Costilla-Reyes, Kaixiong Zhou, Xiaoqian Jiang, Xia Hu "DiscoverPath: A Knowledge Refinement and Retrieval System for Interdisciplinarity on Biomedical Research." Demo Track, Best Demo Final-list.

8. **[ECML' 23]** **Guanchu Wang**, Mengnan Du, Ninghao Liu, Na Zou, Xia Hu "Mitigating Algorithmic Bias with Limited Annotations."

9. **[ICML' 23]** **Guanchu Wang**, Zirui Liu, Zhimeng Jiang, Ninghao Liu, Na Zou, Xia Hu "DIVISION: Memory Efficient Training via Dual Activation Precision."

10. **[ICLR' 23]** **Guanchu Wang***, Yu-Neng Chuang*, Fan Yang, Quan Zhou, Pushkar Tripathi, Xuanting Cai, Xia Hu "CoRTX: Contrastive Learning for Real-time Explanations."

11. **[CIKM' 22]** **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." Demo Track, Best Demo Award.

12. **[ICML' 22]** **Guanchu Wang***, Yu-Neng Chuang*, Mengnan Du, Fan Yang, Quan Zhou, Pushkar Tripathi, Xuanting Cai, Xia Hu "Accelerating Shapley Explanation via Contributive Cooperator Selection." Spotlight.

13. **[NeurIPS' 21]** Mengnan Du, Subhabrata Mukherjee, **Guanchu Wang**, Ruixiang Tang, Ahmed Hassan Awadallah, Xia Hu "Fairness via Representation Neutralization."

14. **[NeurIPS' 21]** Kwei-Herng Lai, Daochen Zha, Junjie Xu, Yue Zhao, **Guanchu Wang**, Xia Hu "Revisiting Time Series Outlier Detection: Definitions and Benchmarks."

15. **[IJCNN' 21]** Qiangxing Tian, Jinxin Liu, **Guanchu Wang**, Donglin Wang "Learning Transitional Skills with Intrinsic Motivation."

16. **[AAAI' 21]** 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." Demo Track.

17. **[IJCAI' 20]** Qiangxing Tian, **Guanchu Wang**, Jinxin Liu, Donglin Wang "Independent Skill Transfer for Deep Reinforcement Learning."

18. **[GLOBECOM' 17]** **Guanchu Wang**, Chen Gong, Zhengyuan Xu "Signal detection and achievable rates for multiple access optical wireless scattering communication." IEEE Global Communication Conference.

Journal Publications:

1. **[TKDD' 23]** Yao Rong, **Guanchu Wang**, Qizhang Feng, Ninghao Liu, Zirui Liu, Enkelejda Kasneci, Xia Hu "Efficient GNN Explanation via Learning Removal-based Attribution." ACM Transactions on Knowledge Discovery from Data.

2. **[JOCN' 23]** Yuchen Pan, **Guanchu Wang**, Yubo Zhang, Jingyin Tang, Chen Gong, Zhengyuan Xu. "Graph-based Conflict-free MAC Protocol and Conflict Analysis for Two-layer Ultraviolet Communication Network." IEEE Journal of Optical Communications and Networking.

3. **[TCOM' 21]** Zhimeng Jiang, Chen Gong, **Guanchu Wang**, Zhengyuan Xu. "On the Achievable Rate and Capacity for a Sample-based Practical Photon-counting Receiver." IEEE Transaction on Communication.

4. [PJ' 19] **Guanchu Wang**, Chen Gong, Zhimeng Jiang, Zhengyuan Xu. "Multi-layer Superimposed Transmission for Optical Wireless Scattering Communication." IEEE Photonics Journal.

5. [TCOM' 18] **Guanchu Wang**, Chen Gong, Zhengyuan Xu, "Signal Characterization for Multiple Access Non-line of Sight Scattering Communication." IEEE Transaction on Communication.

6. [PJ' 18] **Guanchu Wang**, Kun Wang, Chen Gong, Difan Zou, Zhimeng Jiang, Zhengyuan Xu. "A 1Mbps Real-time NLOS UV Scattering Communication System with Receiver Diversity over 1km." IEEE Photonics Journal.

Preprints

1. Matthew B. Neeley*, B.S., Guantong Qi*, B.S., **Guanchu Wang***, M.S., Ruixiang Tang, Ph.D., Dongxue Mao, Ph.D., Chaozhong Liu, Ph.D., Sasidhar Pasupuleti, M.S., Bo Yuan, Ph.D., Fan Xia, Ph.D., Hugo Bellen, D.V.M, Ph.D., Pengfei Liu, Ph.D., Zhandong Liu, Ph.D., Xia Hu, Ph.D. "Benchmarking Large Language Models for the Genetic Diagnosis of Rare Mendelian Diseases." Under review of New England Journal of Medicine (IF 96.2).

2. **Guanchu Wang***, M.S., Junhao Ran*, M.S., Ruixiang Tang, Ph.D., Chia-Yuan Chang, B.S., Yu-neng Chuang, M.S., Zirui Liu, Ph.D., Vladimir Braverman, Ph.D., Zhandong Liu, Ph.D., Xia Hu, Ph.D. "Assessing and Enhancing Large Language Models in Rare Disease Question-answering." Under review of Journal of Biomedical Informatics.

3. Yu-Neng Chuang*, Songchen Li*, Jiayi Yuan*, **Guanchu Wang***, Kwei-Herng Lai, Leisheng Yu, Sirui Ding, Chia-Yuan Chang, Qiaoyu Tan, Daochen Zha, Xia Hu "Understanding Different Design Choices in Training Large Time Series Models."

4. **Guanchu Wang**, Yu-Neng Chuang, Huiyuan Chen, Yuzhong Chen, Zhimeng Jiang, Zirui Liu, Jiayi Yuan, Xia Hu "LEMO: Learning Shapley Manifold from Feature Ablation."

5. Chia-Yuan Chang, Yu-Neng Chuang, **Guanchu Wang**, Mengnan Du, Na Zou "DISPEL: Domain Generalization via Domain-Specific Liberating."

6. Yu-Neng Chuang, **Guanchu Wang**, Fan Yang, Zirui Liu, Xuanting Cai, Mengnan Du, Xia Hu "Efficient XAI Techniques: A Taxonomic Survey."

AWARDS

Doctoral Forum Travel Award in SDM' 24	*Mar 2024*
Award of Future Leader Summit	*Feb 2024*
Best Demo Honorable Mention in CIKM' 23	*Oct 2023*
Ken Kennedy Institute Fellowship	*Dec 2022*
Best Demo Award in CIKM' 22	*Oct 2022*
Spotlight in ICML' 22	*Sep 2022*
Rice University Graduate Fellowship	*Aug 2021*

RESEARCH EXPERIENCE

Research Scientist Intern	*May 2024 - Aug 2024*
Mentor: Dr. Yuzhong Chen and Dr. Huiyuan Chen	VISA Research, Foster City, CA, USA
Graduate Research Assistant	*Aug 2021 - present*
Advisor: Dr. Xia (Ben) Hu	Rice University, Houston, TX, USA
Research Assistant	*Aug 2020 - July 2021*
Advisor: Dr. Xia (Ben) Hu	Texas A&M University, College Station, TX, USA

Research Assistant *Aug 2019 - Jan 2022*
Advisor: Dr. Donglin Wang Westlake University, Hangzhou, Zhejiang, P.R.C.

RESEARCH PROPOSAL EXPERIENCES

Health Equity and Access Responsible Transplanation *2024*
PI: Dr. Cheryl Brown (UNC Charlotte), Dr. Felesia Stukes (HBCU), Dr. Na Zou (HSI), Dr. Xia Hu (RICE), Dr. Xiaoqian Jiang (UTHeath), Dr. Yafen Liang (UTHeath)
Status of Support: Current
Source of Support: AIM-AHEAD Programs

ReDDDoT Phase 2: Responsible Multi-Modal AI Systems for Multi-Hazard Resilience and Situational Awareness *2024*
PI: Dr. Jamie Padgett; Co-PI: Dr. Xia Hu
Status of Support: Current
Source of Support: National Science Foundation

Collaborative Research: III: Medium: Towards Effective Detection and Mitigation for Shortcut Learning: A Data Modeling Framework *2023*
PI: Dr. Xia Hu
Status of Support: Current
Source of Support: National Science Foundation

TEACHING & GUEST LECTURE

Introduction to Information Retrieval *Spring 2023*
Teaching Assistant Rice University, Houston, TX, USA
Machine Learning with Graph *Spring 2022*
Teaching Assistant Rice University, Houston, TX, USA
Introduction of Large Language Models *Sep 2024*
Guest Lecture in Graduate Research Seminar Rice University, Houston, TX, USA
Efficient Algorithms of Shapley Values *Mar 2023*
Guest Lecture in Graduate Seminar of CS Department Rice University, Houston, TX, USA

Matrix Analysis *Fall 2018*
Teaching Assistant University of Science and Technology of China, P.R.C.

MENTORSHIP

Junhao Ran *May 2024 - Aug 2024*
M.S. Student, Rice University Large Language Models for Rare Disease Diagnosis
Lingxi Zhang *May 2024 - Present*
Ph.D. Student, Rice University Large Language Models for Text-style Transfer
Songchen Li *Oct 2023 - July 2024*
Ph.D. Student, Rice University Foundational Models for Time-series Forecasting
Khushbu Pahwa *Oct 2023 - Jan 2024*
Ph.D. Student, Rice University Large Language Models for Medical Applications
Yao Rong *Aug 2022 - May 2023*
Ph.D. Student, Technical University of Munich Explainable Graph Neural Networks
Chia-yuan Chang *Aug 2022 - May 2023*
Ph.D. Student, Texas A&M University Domain Generalization of Deep Neural Networks

Ryan Beckwith   *June 2022 - Aug 2022*
Ph.D. Student, Tufts University   Medical Anomaly Detection
Yu-Neng Chuang   *Mar 2022 - Sep 2022*
Ph.D. Student, Rice University   Real-time Explanations of Deep Neural Networks

ACADEMIC SERVICES

Program Committee Member: NeurIPS, ICML, KDD, AAAI, SIGIR, CIKM.

Journal Reviewer: ACM TIST, TAI, TCDS; IEEE IS, CL.