

# Ruijie Wang

Postdoctoral Research Associate, University of Illinois Urbana-Champaign, Urbana, IL, USA

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## Educations

### University of Illinois Urbana-Champaign

Department of Computer Science

Urbana, USA

Sept. 2019 – Dec. 2023

- Ph.D. in Computer Science
- **Advisor:** Prof. [Tarek F. Abdelzaher](#)
- **Thesis Committee:** Prof. [Jiawei Han](#), Prof. [Hanghang Tong](#), Prof. [Boleslaw K. Szymanski](#)

### Shanghai Jiao Tong University

Department of Computer Science

Shanghai, China

Sept. 2015 – Jul. 2019

- B.S. in Computer Science
- **Advisors:** Prof. [Xinbing Wang](#) & Prof. [Weinan Zhang](#)
- Outstanding Graduates in Shanghai Jiao Tong University

## Research Interests

- My research interests lie in deep graph learning algorithms for real-world graphs at scale to understand the underlying dynamic patterns and predict future knowledge. I am also generally interested in enhancing cutting-edge large language models and time-series analysis by using graph machine learning techniques.

## Employment History

### Postdoctoral Research Associate, University of Illinois Urbana-Champaign

UIUC, References: Prof. [Tarek F. Abdelzaher](#), Prof. [Jiawei Han](#), and Prof. [Hanghang Tong](#)

Urbana, IL

Jan. 2024 – Now

- Lead DARPA INCAS, MIPs, JUMP 2.0 projects, and work on graph learning system for temporal graphs at scale.

### Applied Scientist Intern, Amazon Search Team

Amazon, Host: [Bing Yin](#) and Dr. [Zheng Li](#)

Palo Alto, CA

May 2022 – Oct. 2022

- Work on cross-lingual temporal knowledge graph reasoning to boost performance on low-resource languages.

### Applied Scientist Intern, Amazon Search Team

Amazon, Host: Dr. [Zheng Li](#) and Dr. [Danqing Zhang](#)

Palo Alto, CA

May 2021 – Oct. 2021

- Work on temporal event forecasting model for joint product and query recommendation on Amazon platform.

## Research Experiences

### Deep Graph Learning of Social Info-Dynamics

Research Assistant with Prof. [Tarek Abdelzaher](#)

CyPhy Group, UIUC

Sept. 2019 - Now

- We study how to utilize scarce, noisy, and temporally evolving knowledge to learn social info-dynamics, with applications in information diffusion, user behavior modeling, and knowledge graph reasoning.
- **DARPA INCAS:** We study how different foreign populations respond to influence campaigns as a first step towards development of effective countermeasures, PIs: Prof. [Jiawei Han](#), [Hanghang Tong](#) and [Ji Heng](#).
- **DARPA MIPs:** We model information influence pathways on multiple social platforms, PIs: Prof. [Ji Heng](#).
- **DARPA JUMP 2.0:** We study online graph learning model acceleration on modern architectures, PIs: Prof. [Josep Torrellas](#), [Charith Mendis](#).
- **DoD SocialMath:** We theoretically analyze the grounding equation and control mechanism of information propagation on social media, PIs: Prof. [Christian Lebiere](#), [Naira Hovakimyan](#) and [Evangelos Theodorou](#).
- **DARPA SocialSim:** We build simulation core to analyze how external event affects the information propagation on social media, and predict how information propagate in social networks. We rank the top 1 in the DARPA challenges three times. Paper is accepted by WSC 2021, PIs: Prof. [Jiawei Han](#).

- We build Academic Knowledge Graph (AceKG), a large-scale (3.13 billion triples) knowledge graph in academic domain. We implemented the Knowledge Graph System based on Apache Jena consisting of TDB database and SPARQL engine. We further perform entity alignment and rule based inferences to enrich the knowledge graph, which provides benchmark for NRL task. Paper is accepted by CIKM 2018.
- We propose a novel adversarial representation learning model for heterogeneous information network in the academic domain, to deal with author name disambiguation task. A generative adversarial module and self-training strategy are proposed for efficient and effective modeling. Paper is accepted by AAAI 2020.

## Selected Publications (Google Scholar)

- **Ruijie Wang**, Jingyuan Huang, Yutong Zhang, Jinyang Li, Yufeng Wang, Wanyu Zhao, Shengzhong Liu, Charith Mendis and Tarek Abdelzaher. "TGOnline: Enhancing Temporal Graph Learning with Adaptive Online Meta-Learning". **SIGIR** 2024.
- **Ruijie Wang**, Yutong Zhang, Jinyang Li, Shengzhong Liu, Dachun Sun, Tianchen Wang, Tianshi Wang, Yizhuo Chen, Denizhan Kara and Tarek Abdelzaher. "MetaHKG: Meta Hyperbolic Learning for Few-shot Temporal Reasoning". **SIGIR** 2024.
- **Ruijie Wang**, Baoyu Li, Yichen Lu, Dachun Sun, Jinning Li, Yuchen Yan, Shengzhong Liu, Hanghang Tong and Tarek F. Abdelzaher. "Noisy Positive-Unlabeled Learning with Self-Training for Speculative Knowledge Graph Reasoning". **ACL-Findings** 2023.
- **Ruijie Wang**, Zheng Li, Jingfeng Yang, Tianyu Cao, Chao Zhang, Bing Yin, Tarek Abdelzaher. "Mutually-paced Knowledge Distillation for Cross-lingual Temporal Knowledge Graph Reasoning". **The Web Conference** 2023.
- **Ruijie Wang\***, Xinyi Liu\*, Dachun Sun\*, Jinning Li, Christina Youn, You Lyu, Jianyuan Zhan, Dayou Wu, Xinhe Xu, Mingjun Liu, Xinshuo Lei, Zhihao Xu, Yutong Zhang, Zehao Li, Qikai Yang, Tarek Abdelzaher. "Influence Mapping on Social Media based on Interpretable Ideological Embedding". **IEEE CIC** 2023.
- **Ruijie Wang**, Zheng Li, Dachun Sun, Shengzhong Liu, Jinning Li, Bing Yin, Tarek Abdelzaher. "Learning to Sample and Aggregate: Few-shot Reasoning over Temporal Knowledge Graph". **NeurIPS** 2022.
- **Ruijie Wang**, Zheng Li, Danqing Zhang, Qingyu Yin, Tong Zhao, Bing Yin, Tarek Abdelzaher. "RETE: Retrieval-Enhanced Temporal Event Forecasting on Query Product Evolutionary Graph". **The Web Conference** 2022.
- **Ruijie Wang**, Zijie Huang, Shengzhong Liu, Huajie Shao, Dongxin Liu, Jinyang Li, Tianshi Wang, Tarek Abdelzaher. "DyDiff-VAE: A Dynamic Variational Framework for Information Diffusion Prediction". The 44th International Conference on Research and Development in Information Retrieval (**SIGIR**), 2021.
- **Ruijie Wang**, Yuchen Yan, Jialu Wang, Yuting Jia, Weinan Zhang, Xinbing Wang. "AceKG: A Large-scale Knowledge Graph for Academic Data Mining". The 27th International Conference on Information and Knowledge Management (**CIKM**), 2018.
- Tianshi Wang, Jinyang Li, **Ruijie Wang**, Denizhan Kara, Shengzhong Liu, Davis Wertheimer, Antoni Martin, Raghu Ganti, Mudhakar Srivatsa, Tarek Abdelzaher. "SudokuSens: Enhancing Deep Learning Robustness for IoT Sensing Applications using a Generative Approach". **Sensys** 2023.
- Shengzhong Liu, Tomoyoshi Kimura, Dongxin Liu, **Ruijie Wang**, Jinyang Li, Suhas Diggavi, Mani Srivastava, Tarek Abdelzaher. "FOCAL: Contrastive Learning for Multimodal Time-Series Sensing Signals in Factorized Orthogonal Latent Space". **NeurIPS** 2023.
- Yuchen Yan, Baoyu Jing, Lihui Liu, **Ruijie Wang**, Jinning Li, Tarek Abdelzaher, Hanghang Tong. "Reconciling Competing Sampling Strategies of Network Embedding". **NeurIPS** 2023.
- Xinyi Liu, Jinning Li, Dachun Sun, **Ruijie Wang**, Tarek Abdelzaher, Matt Brown, Anthony Barricelli, Matthias Kirchner, Arslan Basharat. "Unsupervised Image Classification by Ideological Affiliation from User-Content Interaction Patterns". **ICCCN** 2023.

- Deepti Kalasapura, Jinyang Li, Shengzhong Liu, Yizhuo Chen, **Ruijie Wang**, Tarek Abdelzaher, Matthew Caesar, Joydeep Bhattacharyya, Jae Kim, Guijun Wang, Greg Kimberly, Josh Eckhardt, Denis Osipychov. "TwinSync: A Digital Twin Synchronization Protocol for Bandwidth-limited IoT Applications". **ICCCN** 2023.
- Chaoqi Yang, **Ruijie Wang**, Shuochao Yao, Tarek Abdelzaher. "Semi-supervised Hypergraph Node Classification on Hypergraph Line Expansion". The 31th ACM International Conference on Information and Knowledge Management (**CIKM**), 2022.
- Jinning Li, Huajie Shao, Dachun Sun, **Ruijie Wang**, Yuchen Yan, Jinyang Li, Shengzhong Liu, Hanghang Tong, Tarek Abdelzaher. "Unsupervised Belief Representation Learning in Polarized Networks with Information-Theoretic Variational Graph Auto-Encoders". The International Conference on Research and Development in Information Retrieval (**SIGIR**), 2022
- Dachun Sun, Chaoqi Yang, Jinyang Li, **Ruijie Wang**, Shuochao Yao, Huajie Shao, Dongxin Liu, Shengzhong Liu, Tianshi Wang, Tarek F Abdelzaher. "Computational Modeling of Hierarchically Polarized Groups by Structured Matrix Factorization". *Frontiers in Big Data*, 2021.
- Dongxin Liu, Tianshi Wang, Shengzhong Liu, **Ruijie Wang**, Shuochao Yao, Tarek Abdelzaher. "Contrastive self-supervised representation learning for sensing signals from the time-frequency perspective". The International Conference on Computer Communications and Networks (**ICCCN**), 2021.
- Tianshi Wang, Shuochao Yao, Shengzhong Liu, Jinyang Li, Dongxin Liu, Huajie Shao, **Ruijie Wang**, Tarek Abdelzaher. "Audio Keyword Reconstruction from On-Device Motion Sensor Signals via Neural Frequency Unfolding". The ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (**IMWUT/UbiComp**), 2021.
- Haiwen Wang, **Ruijie Wang**, Chuan Wen, Shuhao Li, Yuting Jia, Weinan Zhang, Xinbing Wang. "Author Name Disambiguation on Heterogeneous Information Network with Adversarial Representation Learning". The Thirty-Fourth AAAI Conference on Artificial Intelligence (**AAAI**), 2020.
- Chaoqi Yang, Jinyang Li, **Ruijie Wang**, Shuochao Yao, Huajie Shao, Dongxin Liu, Shengzhong Liu, Tianshi Wang, Tarek Abdelzaher. "Hierarchical Overlapping Belief Estimation by Structured Matrix Factorization". International Conference on Advances in Social Networks Analysis and Mining (**ASONAM**), 2020.
- Huajie Shao, Shuochao Yao, Andong Jing, Shengzhong Liu, Dongxin Liu, Tianshi Wang, Jinyang Li, Chaoqi Yang, **Ruijie Wang** and Tarek Abdelzaher. "Misinformation Detection and Adversarial Attack Cost Analysis in Directional Social Networks". The 29th International Conference on Computer Communications and Networks (**ICCCN**), 2020.
- Shengzhong Liu, Shuochao Yao, Yifei Huang, Dongxin Liu, Huajie Shao, Yiran Zhao, Jinyang Li, Tianshi Wang, **Ruijie Wang**, Chaoqi Yang, Tarek Abdelzaher. "Handling Missing Sensors in Topology-aware IoT Applications with Gated Graph Neural Networks". The ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (**IMWUT/UbiComp**), 2020.

## Selected Projects

### Anatomy of Conflict Tools

Advisor: Prof. [Tarek Abdelzaher](#)

UIUC

Mar. 2022 - Now

- A data pipeline to analyze physical events based on streaming social media data.

### COVID-19 Prediction Tools

Advisor: Prof. [Tarek Abdelzaher](#)

UIUC

Mar. 2020 - June. 2020

- A COVID-19 prediction system, working for predicting number of cases under various reopening policies.

### Distributed MapReduce System

Advisor: Prof. [Indranil Gupta](#)

UIUC



Sept. 2019 - Dec. 2019

- A simple distributed MapReduce-like system consisting of a naïve scheduler, a gossip-style heartbeating protocol and a reliable simple distributed file system.

- A novel academic system (Acemap), working for data analysis and visualization of scholarly networks.

## Academic Services

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- **Conference PC Member and Reviewer:** IJCAI 2024&2023, SIGIR 2024&2023, LoG 2023, EMNLP 2023, NeurIPS 2023, ECML/PKDD 2023, ACL 2023, KDD 2023, , ICLR 2023, AAAI 2023&2022&2021, ESWC 2022&2021.
- **Journal Reviewer:** IEEE Transactions on Knowledge and Data Engineering (TKDE).
- **Conference Volunteer:** INFOCOM 2021.
- **Teaching Assistant:** CS498 Cloud Computing Applications, UIUC ; EE448 Big Data Mining, SJTU .

## Honors and Awards

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- **Conference Presentation Award, UIUC.** 2023
- **CIKM NSF Travel Award.** 2022
- **Outstanding Graduates in Shanghai Jiao Tong University.** 2019
- **Rong Chang Innovation Scholarship.** (Top 20 student scholars in SJTU) 2018
- **Chunstung Scholar.** (Top 50 student scholars in SJTU) 2018
- **Meritorious Winner, Mathematics Contest in Modeling (MCM).** (Top 8% globally) 2018
- **EIC Education Scholarship.** (Top 2% in CS Department) 2017
- **Samsung Scholarship.** (Top 2% in CS Department) 2017
- **Bronze Medal & First Prize, Chinese Physics Olympiad.** (CPhO, less than 0.1% nationally) 2014

## Skills

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- **Programming Languages:** Proficient in Python, famaliar with C/C++, JAVA, Matlab.
- **Tools:** PyTorch, Tensorflow, LaTeX, Vim, Git, Markdown.