

# Dawei Zhou

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## Research Interests

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Machine learning and data mining, with particular interests in rare category analysis, graph mining, heterogeneous learning, self-supervised learning, and algorithmic fairness.

## Education

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### University of Illinois at Urbana-Champaign

PH.D. STUDENT IN COMPUTER SCIENCE

- Advisor: Prof. Jingrui He, GPA: 4.0/4.0
- Transferred from Arizona State University

*Champaign, IL, U.S.*

*Exp. in May, 2021*

### Arizona State University

PH.D. STUDENT IN CIDSE

- Advisor: Prof. Jingrui He, GPA: 4.0/4.0

*Tempe, AZ, U.S.*

*Aug. 2014 - May, 2019*

### University of Rochester

M.S IN ELECTRICAL AND COMPUTER ENGINEERING

- Advisor: Prof. Jiebo Luo, GPA: 4.0/4.0

*Rochester, NY, U.S.*

*May, 2014*

### Nanjing University of Posts and Telecommunications

B.S. IN ELECTRICAL ENGINEERING

- Advisor: Prof. Pan Su, GPA: 3.7/4.0

*Nanjing, China*

*May, 2012*

## Research and Industry Experiences

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### iSAIL Lab, University of Illinois at Urbana-Champaign

RESEARCH ASSISTANT

- Research on rare category analysis, graph representation learning, domain adaptation, and algorithmic fairness
- Advisor: Prof. Jingrui He

*Champaign, IL, U.S.*

*May, 2019 - Present*

### STAR Lab, Arizona State University

RESEARCH ASSISTANT

- Research on rare category analysis, heterogeneous learning, and financial fraud detection
- Advisor: Prof. Jingrui He

*Tempe, AZ, U.S.*

*Aug. 2014 - May, 2019*

### IBM T.J. Watson Research Center

RESEARCH INTERN

- Worked on financial fraud detection with a domain-adaptive graph generative model
- Mentor: Dr. Yada Zhu

*New York, NY, U.S.*

*May, 2018 - Aug. 2018*

### Early Warning Services, LLC.

SENIOR DATA SCIENTIST

- Developed a high-order graph clustering algorithm to detect financial fraud activities
- Mentor: Mr. Scott Alcorn

*Scottsdale, AZ, U.S.*

*May, 2016 - Aug. 2016*

### VISa Lab, University of Rochester

RESEARCH ASSISTANT

- Research on computer vision, multimedia analysis, and object tracking
- Advisor: Prof. Jiebo Luo

*Rochester, NY, U.S.*

*Dec. 2012 - May, 2014*

## Honors & Awards

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24th Annual Capitol Hill Exhibition

*2018*

Department Nomination for IBM Fellowship, UIUC

*2019*

University of Rochester Graduate Fellowship

*2012*

Huawei Fellowship

*2012*

ACM SIGKDD Travel Award

*2017-2020*

IEEE ICDM Travel Award

*2015-2016*

IJCAI Travel Award

*2015*

AAAI Travel Award

*2015, 2020*

## Summary

- Published: **3** Tutorials, **7** Journal Papers, and **13** Conference Papers
- Impact: **273** citations, h-index: **10**, i10-index: **10**
- Source: Google Scholar (<https://scholar.google.com/citations?user=8dakqOgAAAAJhl=en>, Oct 16, 2020)

## Tutorials

1. **Dawei Zhou**, Jingrui He. *Rare Category Exploration, Exposition, Representation and Interpretation*, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD**), 2019
2. **Dawei Zhou**, Jingrui He. *Rare Category Analysis: Detection, Characterization and Tracking*, SAIM International Conference on Data Mining (**SDM**), 2019
3. **Dawei Zhou**, Jingrui He. *Complex Rare Category Analysis*, IEEE International Conference on Big Data (**BigData**), 2019

## Journal Articles

1. **Dawei Zhou**, Si Zhang, Mehmet Yigit Yildirim, Scott Alcorn, Hanghang Tong, Hasan Davulcu, Jingrui He. *High-Order Structure Exploration on Massive Graphs: A Local Graph Clustering Perspective*, *ACM Transactions on Knowledge Discovery from Data (TKDD)*, 2020
2. **Dawei Zhou\***, Lecheng Zheng\*, Jiejun Xu, Jingrui He. *Misc-GAN: A Multi-Scale Generative Model for Graphs*, *Frontiers in Big Data*, 2019 (\*Equal contribution)
3. Jiacheng Pan, Dongming Han, Fangzhou Guo, **Dawei Zhou**, Nan Cao, Jingrui He, Mingliang Xu, Wei Chen. *RCAnalyzer: Visual Analytics of Rare Categories in Dynamic Networks*, *Frontiers of Information Technology Electronic Engineering*, 2019
4. **Dawei Zhou**, Arun Karthikeyan, Kangyang Wang, Nan Cao, Jingrui He. *Discovering Rare Categories from Graph Streams*, *Data Mining and Knowledge Discovery (DMKD)*, 2016
5. Pei Yang, Hongxia Yang, Haoda Fu, **Dawei Zhou**, Jieping Ye, Theodoros Lappas, Jingrui He. *Jointly Modeling Label and Feature Heterogeneity in Medical Informatics*, *ACM Transactions on Knowledge Discovery from Data (TKDD)*, 2015
6. Li Chen, Jeremy Warner, Pak Lam Yung, **Dawei Zhou**, Wendi Heinzelman, Ilker Demirkol, Ufuk Muncuk, Kaushik Chowdhury, Stefano Basagni. *REACH<sup>2</sup>-Mote: A Range Extending Passive Wake-up Wireless Sensor Node*, *ACM Transactions on Sensor Networks*, 2015
7. Su Pan, Qiang Ye, Shengmei Liu, **Dawei Zhou**. *Joint resource allocation for WLAN&WCDMA integrated networks based on spectral bandwidth mapping*, *Journal of Electronics*, 2011

## Conference Articles

1. **Dawei Zhou**, Lecheng Zheng, Jiawei Han, Jingrui He. *A Data-Driven Graph Generative Model for Temporal Interaction Networks*, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD**), 2020
2. Dongqi Fu, **Dawei Zhou**, Jingrui He. *Local Motif Clustering on Time-Evolving Graphs*, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD**), 2020
3. **Dawei Zhou**, Lecheng Zheng, Jianbo Li, Yada Zhu, Jingrui He. *Domain Adaptive Multi-Modality Neural Attention Network for Financial Forecasting*, The Web Conference (**WWW**), 2020
4. **Dawei Zhou\***, Zhining Liu\*, Yada Zhu, Jinjie Gu, Jingrui He. *Towards Fine-grained Temporal Network Representation via Time-Reinforced Random Walk*, The Thirty-Fourth AAAI Conference on Artificial Intelligence (**AAAI**), 2020 (\*Equal contribution)
5. **Dawei Zhou\***, Zhining Liu\*, Jingrui He. *Towards Explainable Representation of Time-Evolving Graphs via Spatial-Temporal Graph Attention*, ACM International Conference on Information and Knowledge Management (**CIKM**), 2019 (\*Equal contribution)
6. **Dawei Zhou**, Jingrui He, Hongxia Yang, Wei Fan. *SPARC: Self-Paced Network Representation for Few-Shot Rare Category Characterization*, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD**), 2018

7. **Dawei Zhou**, Jingrui He, Hasan Davulcu, Ross Maciejewski. *Motif-Preserving Dynamic Local Graph Cut*, IEEE International Conference on Big Data (**BigData**), 2018
8. **Dawei Zhou**, Si Zhang, Mehmet Yigit Yildirim, Scott Alcorn, Hanghang Tong, Hasan Davulcu, Jingrui He. *A Local Algorithm for Structure-Preserving Graph Cut*, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD**), 2017
9. Si Zhang, **Dawei Zhou**, Mehmet Yigit Yildirim, Scott Alcorn, Jingrui He, Hasan Davulcu, Hanghang Tong. *HiD-Den: Hierarchical Dense Subgraph Detection with Application to Financial Fraud Detection*, SIAM International Conference on Data Mining (**SDM**), 2017
10. **Dawei Zhou**, Jingrui He, Yu Cao, Jae-sun Seo. *Bi-level Rare Temporal Pattern Detection*, IEEE International Conference on Data Mining (**ICDM**), 2016
11. **Dawei Zhou**, Kangyang Wang, Nan Cao, Jingrui He. *Rare Category Detection on Time-Evolving Graphs*, IEEE International Conference on Data Mining (**ICDM**), 2015
12. **Dawei Zhou**, Jingrui He, K. Selcuk Candan, Hasan Davulcu. *MUVIR: Multi-View Rare Category Detection*, The 24th International Joint Conference on Artificial Intelligence (**IJCAI**), 2015
13. **Dawei Zhou**, Jiebo Luo, Vincent Silenzio, Yun Zhou, Jile Hu, Glenn Currier, Henry Kautz. *Tackling Mental Health by Integrating Unobtrusive Multimodal Sensing*, The Twenty-Ninth AAAI Conference on Artificial Intelligence (**AAAI**), 2015

## Professional Activities

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### Program Committee

Senior Program Committee, International Joint Conference on Artificial Intelligence (IJCAI)	2021
Program Committee, AAAI Conference on Artificial Intelligence (AAAI)	2021
Program Committee, International Conference on Machine Learning (ICML)	2021
Program Committee, International Conference on Learning Representations (ICLR)	2021
Program Committee, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)	2021
Program Committee, SIAM International Conference on Data Mining (SDM)	2021
Program Committee, International Conference on Research and Development in Information Retrieval (SIGIR)	2021
Program Committee, International Conference on Web Search and Data Mining (WSDM)	2021
Program Committee, AAAI Conference on Artificial Intelligence (AAAI)	2020
Program Committee, International Joint Conference on Artificial Intelligence (IJCAI)	2020
Program Committee, Conference on Neural Information Processing Systems (NeurIPS)	2020
Program Committee, International Conference on Machine Learning (ICML)	2020
Program Committee, International Conference on Learning Representations (ICLR)	2020
Program Committee, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)	2020
Program Committee, IEEE International Conference on Data Mining (ICDM)	2020
Program Committee, The Web Conference (WWW)	2020
Program Committee, International Conference on Research and Development in Information Retrieval (SIGIR)	2020
Program Committee, ACM International Conference on Information and Knowledge Management (CIKM)	2020
Program Committee, IEEE International Conference on Big Data (BigData)	2020
Program Committee, AAAI Conference on Artificial Intelligence (AAAI)	2019
Program Committee, Conference on Neural Information Processing Systems (NeurIPS)	2019
Program Committee, International Conference on Machine Learning (ICML)	2019
Program Committee, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)	2019
Program Committee, ACM International Conference on Information and Knowledge Management (CIKM)	2019
Program Committee, IEEE International Conference on Big Data (BigData)	2019
Program Committee, AAAI Conference on Artificial Intelligence (AAAI)	2018
Program Committee, Conference on Neural Information Processing Systems (NeurIPS)	2018
Program Committee, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)	2018
Program Committee, ACM International Conference on Information and Knowledge Management (CIKM)	2018
Program Committee, IEEE International Conference on Big Data (BigData)	2018
Program Committee, AAAI Conference on Artificial Intelligence (AAAI)	2017
Program Committee, ACM International Conference on Information and Knowledge Management (CIKM)	2017

## Organizing Committee

<b>Publicity Chair, Workshop on Deep Learning on Graphs: Methods and Applications at AAAI 2021</b>	2021
<b>Co-Chair, Workshop on Using Alternative Data to Support Intelligent Decisions for Financial Service at SDM 2020</b>	2020
<b>Session Chair, IEEE International Conference on Big Data (BigData) 2019</b>	2019
<b>Session Chair, IEEE International Conference on Big Data (BigData) 2018</b>	2018

## Journal Reviewer

<b>IEEE Transactions on Knowledge and Data Engineering (TKDE)</b>	2020
<b>ACM Transactions on Knowledge Discovery from Data (TKDD)</b>	2020
<b>Data Mining and Knowledge Discovery (DMKD)</b>	2020
<b>IEEE Transactions on Knowledge and Data Engineering (TKDE)</b>	2019
<b>ACM Transactions on Knowledge Discovery from Data (TKDD)</b>	2019
<b>Data Mining and Knowledge Discovery (DMKD)</b>	2019
<b>Neurocomputing</b>	2019
<b>IEEE Transactions on Knowledge and Data Engineering (TKDE)</b>	2018
<b>Data Mining and Knowledge Discovery (DMKD)</b>	2018
<b>Neurocomputing</b>	2018

## Science Outreach & Selected Media Coverage

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<b>Domain Adaptive Multi-Modality Neural Attention Network for Financial Forecasting</b>	News
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN • <a href="https://ischool.illinois.edu/news-events/news/2020/04/he-research-group-present-web-conference">https://ischool.illinois.edu/news-events/news/2020/04/he-research-group-present-web-conference</a>	2020
<b>Fine-grained Temporal Network Representation via Time-Reinforced Random Walk</b>	News
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN • <a href="https://ischool.illinois.edu/news-events/news/2020/02/he-research-group-present-artificial-intelligence-conference">https://ischool.illinois.edu/news-events/news/2020/02/he-research-group-present-artificial-intelligence-conference</a>	2020
<b>Modeling the Heterogeneity of Heterogeneity: Algorithms, Theories and Applications</b>	Blogs
COMPUTING RESEARCH ASSOCIATION (CRA) • <a href="https://cra.org/govaffairs/blog/2018/05/2018-cnsf-exhibition/">https://cra.org/govaffairs/blog/2018/05/2018-cnsf-exhibition/</a>	2018
<b>Mental Health Monitoring Through Selfie Videos and Social Media Tracking</b>	News
UNIVERSITY OF ROCHESTER • <a href="https://www.rochester.edu/newscenter/mental-health-monitoring-through-selfie-videos-and-social-media-tracking-87632/">https://www.rochester.edu/newscenter/mental-health-monitoring-through-selfie-videos-and-social-media-tracking-87632/</a>	2018

## Invited Talks

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<b>Harnessing Rare Category Trinity for Complex Data</b>	Online
AI-TIME SEMINAR • Tsinghua University	Nov. 2020
<b>A Data-Driven Graph Generative Model for Temporal Interaction Networks</b>	Online
ORAL PRESENTATION • ACM SIGKDD Conference on Knowledge Discovery and Data Mining 2020	Aug. 2020
<b>Domain Adaptive Multi-Modality Neural Attention Network for Financial Forecasting</b>	Online
ORAL PRESENTATION • The Web Conference 2020	Apr. 2020
<b>Graph-Based Rare Category Analysis</b>	Los Angeles, CA, U.S.
KEYNOTE • Workshop on Deep Learning on Graphs: Methods and Applications at IEEE BigData 2019	Dec. 2019
<b>Rare Category Exploration, Exposition, Representation and Interpretation</b>	Anchorage, AK, U.S.
LECTURE-STYLE TUTORIAL • ACM SIGKDD Conference on Knowledge Discovery and Data Mining 2019	Aug. 2019
<b>Rare Category Analysis: Detection, Characterization and Tracking</b>	Calgary, Canada
LECTURE-STYLE TUTORIAL • SIAM International Conference on Data Mining 2019	Aug. 2019
<b>Complex Rare Category Analysis</b>	Seattle, WA, U.S.
LECTURE-STYLE TUTORIAL • IEEE International Conference on Big Data 2018	Dec. 2018

### **A Local Algorithm for Structure-Preserving Graph Cut**

ORAL PRESENTATION

- ACM SIGKDD Conference on Knowledge Discovery and Data Mining 2017

*Halifax, Canada*

*Aug. 2017*

### **Bi-level Rare Temporal Pattern Detection**

ORAL PRESENTATION

- IEEE International Conference on Data Mining 2016

*Barcelona, Spain*

*Aug. 2016*

### **MUVIR: Multi-View Rare Category Detection**

ORAL PRESENTATION

- International Joint Conference on Artificial Intelligence 2015

*Buenos Aires, Argentina*

*Aug. 2016*

## **Teaching Experiences**

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### **University of Illinois at Urbana-Champaign**

TEACHING ASSISTANT

- CS412: An Introduction to Data Mining

*Champaign, IL, U.S.*

*Aug. 2020 - Dec. 2020*

### **University of Illinois at Urbana-Champaign**

GUEST LECTURER

- IS 590: Data Mining,

*Champaign, IL, U.S.*

*Oct. 2019*

### **Arizona State University**

TEACHING ASSISTANT

- CS412: Statistical Machine Learning

*Tempe, AZ, U.S.*

*Mar. 2019*

### **Arizona State University**

GUEST LECTURER

- CS412: Statistical Machine Learning

*Tempe, AZ, U.S.*

*Jan. 2019 - May. 2019*

### **University of Rochester**

TEACHING ASSISTANT

- CS446: Digital Signal Processing

*Rochester, NY, U.S.*

*Aug. 2013 - Dec. 2013*

## **Mentoring Experiences**

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### **Lecheng Zheng, Ph.D. Student**

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

- Research on graph generative model and data augmentation

*Champaign, IL, U.S.*

*Aug. 2018 - Present*

### **Dongqi Fu, Ph.D. Student**

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

- Research on high-order network organization and motif-based spectral clustering

*Champaign, IL, U.S.*

*Aug. 2019 - Present*

### **Xiaotong Hu, Ph.D. Student**

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

- Research on financial fraud detection

*Champaign, IL, U.S.*

*Aug. 2020 - Present*

### **Arun Karthikeyan, M.S. Student**

ARIZONA STATE UNIVERSITY

- Research on rare category analysis

*Tempe, AZ, U.S.*

*Aug. 2016 - Dec. 2016*

## **University Services**

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### **University of Illinois at Urbana-Champaign**

ORGANIZER OF SEMINAR

- Statistical Learning and Data Mining Reading Seminar

*Champaign, IL, U.S.*

*Aug. 2019 - Present*

### **University of Illinois at Urbana-Champaign**

GRADUATE AMBASSADOR

- Orientation in the Department of Computer Science

*Champaign, IL, U.S.*

*2019 - 2020*

### **Arizona State University**

COORDINATOR OF CIDSE

- ASU Open Door

*Tempe, AZ, U.S.*

*2017 - 2019*

## References

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### **Jingrui He, Ph.D.**

ASSOCIATE PROFESSOR, SCHOOL OF INFORMATION SCIENCES, UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

- Phone: +1(480)-727-1835
- Email: [jingrui@illinois.edu](mailto:jingrui@illinois.edu)
- Address: Room 106, 505 E. Green St., Champaign, IL 61820, USA
- Homepage: <https://ischool.illinois.edu/people/jingrui-he>

### **Jiawei Han, Ph.D., Fellow of ACM and IEEE**

CHAIR PROFESSOR, DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

- Phone: +1(217)-333-6903
- Email: [hanj@illinois.edu](mailto:hanj@illinois.edu)
- Address: Room 2132, 201 N. Goodwin Avenue, Urbana, IL 61801, USA
- Homepage: <http://hanj.cs.illinois.edu/>

### **Leman Akoglu, Ph.D.**

DEAN'S ASSOCIATE PROFESSOR, HEINZ COLLEGE OF INFORMATION SYSTEMS AND PUBLIC POLICY, CARNEGIE MELLON UNIVERSITY

- Phone: +1(412)-268-3043
- Email: [lakoglu@andrew.cmu.edu](mailto:lakoglu@andrew.cmu.edu) (admin: [azottola@andrew.cmu.edu](mailto:azottola@andrew.cmu.edu))
- Address: 2118C Hamburg Hall, 4800 Forbes Ave, Pittsburgh, PA 15213, USA
- Homepage: <http://www.andrew.cmu.edu/user/lakoglu/>

### **Jiebo Luo, Ph.D., Fellow of ACM and IEEE**

PROFESSOR, DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF ROCHESTER

- Phone: +1(585)-276-5784
- Email: [jluo@cs.rochester.edu](mailto:jluo@cs.rochester.edu)
- Address: 3101 Wegmans Hall, 250 Hutchison Rd, Rochester, NY 14620, USA
- Homepage: <https://www.cs.rochester.edu/u/jluo/>