CHUXU ZHANG

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RESEARCH INTEREST

My research interests lie in the areas of data science, machine learning, artificial intelligence, and their applications in graphs/network mining, recommender system/user modeling, synthetic chemistry, natural language processing, time series/spatial-temporal data analysis, etc.

EDUCATION

University of Notre Dame, South Bend, IN, USA 05/2017 – 05/2020
Ph.D. in Computer Science and Engineering *Advisor: Prof. Nitesh V. Chawla*
Thesis - Learning from Heterogeneous Data

Rutgers University, New Brunswick, NJ, USA 09/2014 – 05/2017
M.S. in Computer Science *Advisor: Prof. Tina Eliassi-Rad and Prof. Chirag Shah*

University of Electronic Science and Technology of China, Chengdu, China 09/2009 – 07/2013
B.E. in Electronic Information Engineering *Advisor: Prof. Tao Zhou*

PROFESSIONAL EXPERIENCE

Brandeis University, Waltham, MA, USA Start at 07/2020
Assistant Professor

University of Notre Dame, South Bend, IN, USA 05/2017 – 05/2020
Research Assistant *Advisor: Prof. Nitesh V. Chawla*

Microsoft Research, Redmond, WA, USA 05/2019 – 08/2019
Research Intern *Manager: Dr. Ryen W. White*

NEC Labs America, Princeton, NJ, USA 05/2018 – 08/2018
Research Intern *Manager: Dr. Haifeng Chen*

IBM Watson Research Center, Yorktown Heights, NY, USA 05/2015 – 08/2015
Research Intern *Manager: Dr. Ching-Yung Lin*

Rutgers University, New Brunswick, NJ, USA 09/2014 – 05/2017
Research and Teaching Assistant *Advisor: Prof. Tina Eliassi-Rad and Prof. Chirag Shah*

PUBLICATION

♢ Summary: As of 4/2020, 20+ Papers, 550+ Citations, h-index = 11 (Google Scholar)

- Graphs/Network Mining
  Graph Neural Network [C15], Network Embedding [C13], Relation Learning [C8,C7,M2], Knowledge Graph Reasoning [C18], Few-Shot Learning in Graphs [C17,W3]
- Recommender System/User Modeling
  Rating Prediction [C4,J3], Item Ranking [C6,C1,M1], Personalized Ranking [C2,W1], Social Recommendation [C5], Sequential Recommendation [C9], User Modeling [C14,M3]
- Time Series/Spatial Temporal Data Analysis
  Anomaly Detection in Time Series [C10], Urban Event Prediction [C19,C16,C12,C11]
- Complex Network/System
  Information Diffusion Modeling and Control [C3,J5,J4,J2,W2], Network Evolution Modeling [J1]

◊ Tutorials

[T1] [**KDD-20**] **C. Zhang**, M. Jiang, X. Zhang, Y. Ye, N. Chawla, Multi-modal Network Representation Learning: Methods and Applications, The ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2020

◊ Conference Papers (**All Are Regular Full Papers**)

[C19] [**IJCAI-20**] C. Huang, **C. Zhang**, P. Dai, L. Bo, Cross-Interaction Hierarchical Attention Networks for Urban Anomaly Prediction, The International Joint Conference on Artificial Intelligence, 2020

[C18] [**AAAI-20**] **C. Zhang**, H. Yao, M. Jiang, Z. Li, N. Chawla, Few-Shot Knowledge Graph Completion, The AAAI Conference on Artificial Intelligence, 2020

[C17] [**AAAI-20**] H. Yao, **C. Zhang**, W. Yin, M. Jiang, S. Wang, J. Huang, N. Chawla, Z. Li, Graph Few-shot Learning via Knowledge Transfer, The AAAI Conference on Artificial Intelligence, 2020

[C16] [**WWW-20**] C. Huang, X. Wu, **C. Zhang**, N. Chawla, Hierarchically Structured Transformer Networks for Fine-Grained Spatial Event Forecasting, The Web Conference (World Wide Web Conference), 2020

[C15] [**KDD-19**] **C. Zhang**, D. Song, C. Huang, A. Swami, N. Chawla, Heterogeneous Graph Neural Network, The ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2019

[C14] [**KDD-19**] C. Huang, X. Wu, X. Zhang, **C. Zhang**, J. Zhao, D. Yin, N. Chawla, Online Purchase Prediction via Multi-Scale Modeling of Behavior Dynamics, The ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2019

[C13] [**WSDM-19**] **C. Zhang**, A. Swami, N. Chawla, SHNE: Representation Learning for Semantic-Associated Heterogeneous Networks, The ACM International Conference on Web Search and Data Mining, 2019

[C12] [**CIKM-19**] C. Huang, **C. Zhang**, P. Dai, L. Bo, Deep Dynamic Fusion Network for Traffic Accident Forecasting, The ACM International Conference on Information and Knowledge Management, 2019

[C11] [**WWW-19**] C. Huang, **C. Zhang**, J. Zhao, X. Wu, D. Yin, N. Chawla, MiST: A Multiview and Multimodal Spatial-Temporal Learning Framework for Citywide Abnormal Event Forecasting, The Web Conference (World Wide Web Conference), 2019 (**Best Paper Candidate**)

[C10] [**AAAI-19**] **C. Zhang**, D. Song, Y. Chen, X. Feng, C. Lumezanu, W. Cheng, J. Ni, B. Zong, H. Chen, N. Chawla, A Deep Neural Network for Unsupervised Anomaly Detection and Diagnosis in Multivariate Time Series Data, The AAAI Conference on Artificial Intelligence, 2019

[C9] [**AAAI-19**] L. Yu, **C. Zhang**, S. Liang, X. Zhang, Multi-order Attentive Ranking Model for Sequential Recommendation, The AAAI Conference on Artificial Intelligence, 2019

[C8] [**WWW-18**] **C. Zhang**, C. Huang, L. Yu, X. Zhang, N. Chawla, Camel: Content-Aware and Meta-path Augmented Metric Learning for Author Identification, The Web Conference (World Wide Web Conference), 2018

[C7] [**IJCAI-18**] **C. Zhang**, L. Yu, X. Zhang, N. Chawla, Task-Guided and Semantic-Aware Ranking for Academic Author-Paper Correlation Inference, The International Joint Conference on Artificial Intelligence, 2018

[C6] [**AAAI-18**] L. Yu, **C. Zhang**, S. Pei, G. Sun, X. Zhang, WalkRanker: A Unified Pairwise Ranking Model with Multiple Relations for Item Recommendation, The AAAI Conference on Artificial Intelligence, 2018

[C5] [**SDM-17**] **C. Zhang**, L. Yu, Y. Wang, C. Shah, X. Zhang, Collaborative User Network Embedding for Social Recommender Systems, The SIAM International Conference on Data Mining, 2017

[C4] [**BigData-17**] **C. Zhang**, L. Yu, X. Zhang, N. Chawla, ImWalkMF: Joint Matrix Factorization and Implicit Walk Integrative Learning for Recommendation, The IEEE International Conference on Big Data, 2017

[C3] [**APWeb/WAIM-17**] **C. Zhang**, L. Yu, C. Liu, Z.K. Zhang, T. Zhou, A Community-aware Approach to Minimizing Dissemination in Graphs, The Asia Pacific Web and Web-Age Information Management Joint Conference, 2017

[C2] [**WAIM-16**] **C. Zhang**, L. Yu, J. LU, T. Zhou, Z.K. Zhang, AdaWIRL: A Novel Bayesian Ranking Approach for Personal Big-Hit Paper Prediction, The International Conference on Web-Age Information Management, 2016

[C1] [**WAIM-16**] L. Yu, G. Zhou, **C. Zhang**, J. Huang, C. Liu, Z.K. Zhang, Rankmbpr: Rank-aware Mutual Bayesian Personalized Ranking for Item Recommendation, The International Conference on Web-Age Information Management, 2016 (**Best Student Paper Award**)

◊ Workshop Papers

[W4] [**WSDM-20-DC**] **C. Zhang**, Learning from Heterogeneous Networks: Methods and Applications, The ACM International Conference on Web Search and Data Mining, Doctoral Consortium, 2020

[W3] [**NeurIPS-19-W**] H. Yao, **C. Zhang**, Y. Wei, M. Jiang, S. Wang, J. Huang, N. Chawla, Z. Li, Graph Few-shot Learning via Knowledge Transfer, The NeurIPS Graph Representation Learning Workshop, 2019

[W2] [**KDD-15-W**] **C. Zhang**, T. Eliassi-Rad, Minimizing Dissemination in a Population While Maintaining its Community Structure, The ACM SIGKDD Workshop on Population Informatics for Big Data, 2015

[W1] [**ICDM-15-W**] G. Zhou, L. Yu, **C. Zhang**, C. Liu, Z.K. Zhang, J. Zhang, A Novel Approach for Generating Personalized Mention List on Micro-Blogging System, The IEEE International Conference on Data Mining Workshop, 2015

◊ Journal Papers

[J5] Z.K. Zhang, C. Liu, X.X. Zhan, X. LU, **C. Zhang**, Y.C. Zhang, Dynamics of Information Diffusion and Its Applications on Complex Networks, Physics Reports, 651:1-34, 2016

[J4] Z.K. Zhang*, **C. Zhang*** (*co-first authors), X. Han, C. Liu, Emergence of Blind Areas in Information Spreading, PLOS ONE, 9(4):e95785, 2014

[J3] **C. Zhang**, Z.K. Zhang, L. Yu, C. Liu, H. Liu, X. Yan, Information Filtering via Collaborative User Clustering Modeling, Physica A, 396:195-203, 2014

[J2] Y. Sun, C. Liu, **C. Zhang**, Z.K. Zhang, Epidemic Spreading on Weighted Complex Networks, Physics Letters A, 378:635-640, 2014

[J1] **C. Zhang**, Z.K. Zhang, C. Liu, An Evolving Model of Online Bipartite Networks, Physica A, 392:6100-6106, 2013

PROFESSIONAL SERVICE

◊ Conference Program Committee Member

- The Annual Conference on Neural Information Processing Systems, 2020 (NeurIPS-20)
- The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases, 2020 (ECML/PKDD-20)
- The IEEE International Conference on Big Data, 2020 (BigData-20)
- The SIGKDD Conference on Knowledge Discovery and Data Mining, 2020 (KDD-20)
- The International Joint Conference on Artificial Intelligence, 2020 (IJCAI-20)
- The IEEE International Conference on Data Mining, 2020 (ICDM-20)
- The International Conference on Learning Representations, 2020 (ICLR-20)
- The AAAI Conference on Artificial Intelligence, 2020 (AAAI-20)
- The SIAM International Conference on Data Mining, 2020 (SDM-20)
- The IEEE International Conference on Data Mining, 2019 (ICDM-19)
- The ACM International Conference on Information and Knowledge Management, 2019 (CIKM-19)
- The IEEE International Conference on Big Data, 2019 (BigData-19)
- The AAAI Conference on Artificial Intelligence, 2019 (AAAI-19)

◊ Journal Reviewer

- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- ACM Transactions on Knowledge Discovery from Data (TKDD)
- Knowledge and Information Systems (KAIS)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- Data Mining and Knowledge Discovery (DMKD)
- Statistical Analysis and Data Mining (SADM)
- IEEE Transactions on Big Data (TBD)
- Future Generation Computer Systems (FGCS)

PRESENTATION & TALK

- "Few-Shot Knowledge Graph Completion", The AAAI Conference on Artificial Intelligence, New York, NY, USA, 02/2020 (Spotlight)
- "Heterogeneous Graph Neural Network", The ACM SIGKDD Conference on Knowledge Discovery and Data Mining, Anchorage, AK, USA, 08/2019 (Spotlight)
- "Task Recommendation", Microsoft Research, Redmond, WA, USA, 08/2019
- "A Deep Neural Network for Anomaly Detection and Diagnosis in Multivariate Time Series Data", The AAAI Conference on Artificial Intelligence, Honolulu, HI, USA, 01/2019 (Spotlight)
- "A Deep Neural Network for Anomaly Detection and Diagnosis in Multivariate Time Series Data", NEC Labs America, Princeton, NJ, USA, 08/2018
- "Joint Matrix Factorization and Implicit Walk Integrative Learning for Recommendation", The IEEE International Conference on Big Data, Boston, MA, USA, 12/2017
- "Collaborative User Network Embedding for Social Recommender Systems", The SIAM International Conference on Data Mining, Houston, TX, USA, 4/2017
- "AdaWIRL: A Novel Bayesian Ranking Approach for Personal Big-Hit Paper Prediction", The International Conference on Web-Age Information Management, Nanchang, China, 6/2016

TEACHING EXPERIENCE

◊ Guest Lecturer, University of Notre Dame, South Bend, IN, USA
CSE60625 Advanced Topics in Machine Learning, 2019 Fall

◊ Teaching Assistant, Rutgers University, New Brunswick, NJ, USA
CS112 Data Structures, 2017 Spring; CS214 Systems Programming, 2016 Fall; CS214 Systems Programming, 2016 Spring; CS110 Introduction to Computers and Their Application, 2015 Spring; CS211 Computer Architecture, 2014 Fall

STUDENT MENTORING

◊ Lu Yu, Ph.D. student of Computer Science in King Abdullah University of Science and Technology
Mentoring his master and Ph.D. study for recommender system research (2015 Fall - now)
Referred papers [C9,C6,C1,M1]

◊ Mandana Saebi, Ph.D. student of Computer Science in University of Notre Dame
Mentoring her Ph.D. study for knowledge graph research (2019 Spring - now)
Referred papers in submission

◊ Zhichun Guo, Ph.D. student of Computer Science in University of Notre Dame
Mentoring her Ph.D. study for graph neural network research (2019 Fall - now)
Referred papers in submission

PROPOSAL WRITING

◊ AI Institute for Molecular Synthesis
PI: Prof. Nitesh V. Chawla
My role: Contributed to the writing of several major sections of proposal including background, related work, and research plan.
Result: Submitted to National Science Foundation.

◊ NSF Center for Computer Assisted Synthesis
PI: Prof. Olaf Wiest, Co-PI: Prof. Nitesh V. Chawla
My role: Contributed to the writing of one major part of research plan, i.e., heterogeneous knowledge graph representation learning for chemical synthesis.
Result: Submitted to National Science Foundation and was funded in 2019.

◊ From Cross-lingual to Cross-cultural: Seeking out Commonness and Differences through Languages Rooting with Societies
PI: Prof. Xiangliang Zhang, Co-PI: Prof. Nitesh V. Chawla
My role: Contributed to the writing of two parts of research plan, i.e., developing cross-lingual content-aware embedding model for recommendation and few-shot relation reasoning for herbs knowledge graph.
Result: Submitted to KAUST competitive research grants program (CRG) and was rejected in 2019.

AWARD

- Best Paper Award Candidates, The Web Conference (World Wide Web Conference), 2019
- Best Student Paper Award, International Conference on Web-Age Information Management, 2016
- Student Travel Award, The AAAI Conference on Artificial Intelligence, 2020
- Student Travel Award, The ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2019
- Student Travel Award, The AAAI Conference on Artificial Intelligence, 2019
- Student Travel Award, The IEEE International Conference on Big Data, 2017