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## **Education** \_

### College of Engineering, University of California, Santa Barbara (UCSB)

Santa Barbara, USA

DOCTOR OF PHILOSOPHY AND MASTER OF SCIENCE IN COMPUTER SCIENCE

Sep. 2018 - Jun. 2023

- Course GPA: 4.0/4.0, UCSB Computer Science Outstanding Scholar Fellow (top 4 out 63 PhD students).
- Advisor: Prof. Ambuj Singh. Dissertation: Learning Representations for Information-rich Graphs.

### Yingcai Honors College, University of Electronic Science and Technology of China (UESTC)

Chengdu, China

BACHELOR OF ENGINEERING IN COMPUTER SCIENCE AND TECHNOLOGY (HONORS)

Sep. 2014 - Jun. 2018

- GPA: 3.96/4.0, Avg. Score: 92.79/100 (1/90 in freshman year, 1/87 in sophomore year, 1/93 in junior year).
- Recipient of the Most Outstanding Students Awards of UESTC (top 10 out of 5,000 seniors).
- Advisors: Prof. Junming Shao and Prof. Sinno Jialin Pan. Thesis: Transfer Learning for Community Detection in Multiplex Networks.

# **Industry Experience** \_

### Senior Machine Learning Scientist, Live Recommendation, TikTok

San Jose, USA

BILLION-SCALE MACHINE LEARNING FOR TIKTOK LIVE RECOMMENDATION

May. 2023 - Present

- · Leading research in graph-based recommender system, scaling laws of large recommendation models, and generative recommendation.
- Owned the iterations of the core ranking models of TikTok Live Recommendation, leveraging representation learning, multi-task learning, contrastive learning, regression modeling, and sequence modeling, with +7% user watch-live duration gains from online A/B experiments.
- Developed the host go-live model that captures the relationship between watch-live and go-live with causal inference and uplift modeling to motivate authorized hosts to go-live, achieving +2% user go-live penetration in online A/B experiments.

## Applied Scientist Intern, Books Tech, Amazon

San Diego, USA

STOCHASTIC INVENTORY MANAGEMENT FOR PRINT-ON-DEMAND AND GRAPH-BASED TEXT CLASSIFICATION FOR CONTENT INTELLIGENCE

Jun. 2022 - Sep. 2022

- Developed a stochastic inventory management model based on dynamic programming for Amazon's Print-On-Demand business, optimizing the ordering strategy for 42.2M units of books and realizing an annual saving of \$10.4M.
- Designed and implemented a graph-based NLP model for long text embedding and classification using graph neural networks, leading to superior performance to state-of-the-art transformer-based models for Kindle book contents.

### **Applied Scientist Intern, Books Tech, Amazon**

San Diego LISA

GRAPH-BASED FRAUD DETECTION IN KINDLE DIRECT PUBLISHING

Jun. 2021 - Sep. 2021

- Designed graph-based machine learning models for fraud detection based on multi-modal signals in Kindle Direct Publishing.
- Implemented the models in an end-to-end fashion and deployed them to graphs with millions of nodes and billions of edges in production.
- Validation results show that the models can surface fraud rings undetected by existing processes with an estimated annual value of \$2.4M.

#### Applied Scientist Intern, Books Tech, Amazon

San Diego, USA

GRAPH-BASED FRAUD DETECTION IN KINDLE DIRECT PUBLISHING

Jun. 2020 - Sep. 2020

- Proposed to augment existing fraud detection methods with graph-based machine learning models for Kindle Direct Publishing.
- Designed and implemented various heuristics and an embedding framework for attributed heterogeneous multiplex networks.
- The models are deployed into production and results show that they surface up to 15 times more fraud compared to the existing processes.

#### Research Intern, Computational Intelligence Lab, Nanyang Technological University

Singapore

TRANSFER LEARNING FOR COMMUNITY DETECTION IN MULTIPLEX NETWORKS

- Sep. 2017 Feb. 2018
- · Proposed to refine community detection results in some layers with transferred knowledge from other layers in multiplex networks.
- Designed a representation-based community detection framework and implemented it with an extended symmetric NMF approach.
- · Our algorithm outperforms other representation-based community detection algorithms, especially when the target layer is noisy.

## **Publications**

[KDD-2025] João Mattos, **Zexi Huang**, Mert Kosan, Ambuj Singh, Arlei Silva. *Attribute-Enhanced Similarity Ranking for Sparse Link Prediction*. *To appear, ACM SIGKDD Conference on Knowledge Discovery & Data Mining*, 2025.

[TIST-2024] Mert Kosan\*, Zexi Huang\*, Sourav Medya, Sayan Ranu, Ambuj Singh. *GCFExplainer: Global Counterfactual Explainer for Graph Neural Networks*. *ACM Transactions on Intelligent Systems and Technology*, 2024.

[AAAI-2024] Aritra Bhowmick, Mert Kosan, **Zexi Huang**, Ambuj Singh, Sourav Medya. **DGCLUSTER: A Neural Framework for Attributed Graph Clustering via Modularity Maximization**. AAAI Conference on Artificial Intelligence, 2024.

[WSDM-2023] Zexi Huang\*, Mert Kosan\*, Sourav Medya, Sayan Ranu, Ambuj Singh. Global Counterfactual Explainer for Graph Neural Networks. ACM International Conference on Web Search and Data Mining, 2023.

**[WSDM-2022] Zexi Huang**, Arlei Silva, Ambuj Singh. *POLE: Polarized Embedding for Signed Networks*. *ACM International Conference on Web Search and Data Mining*, 2022.

**[KDD-2021] Zexi Huang**, Arlei Silva, Ambuj Singh. *A Broader Picture of Random-walk Based Graph Embedding*. *ACM SIGKDD Conference on Knowledge Discovery & Data Mining*, 2021.

# **Research Projects**

### **Attribute-Enhanced Similarity Ranking for Sparse Link Prediction**

ADVISOR: PROF. AMBUJ SINGH, COLLABORATORS: JOÃO MATTOS, MERT KOSAN, ARLEI SILVA

May. 2021 - Aug. 2024

- Scrutinized the training and evaluation of supervised link prediction methods and identify their limitations in handling class imbalance.
- Proposed a novel topology-centric framework that combines graph learning, topological heuristics, and an N-pair loss for link prediction.
- Results showed that the proposed method is 145% more accurate and trains/infers 11/6,000 times faster than the state-of-the-art methods.

#### **Global Counterfactual Explanation for Graph Neural Networks**

ADVISOR: PROF. AMBUJ SINGH, COLLABORATORS: MERT KOSAN, SOURAV MEDYA, SOURAV MEDYA, SAYAN RANU

Oct. 2021 - Jun. 2024

- Formulated the novel problem of global counterfactual reasoning/explanation of graph neural networks for graph classification.
- · Proposed GCFExplainer, the first global explainer powered by vertex-reinforced random walks on an edit map with a greedy summary.
- Results showed that GCFExplainer not only provides crucial high-level insights but also outperforms existing methods in recourse quality.

### **Signed Embedding for Polarized Graphs**

ADVISOR: PROF. AMBUJ SINGH, COLLABORATOR: ARLEI SILVA

Oct. 2020 - Aug. 202

- Designed a novel polarization measure for signed graphs and showed that existing methods fail in polarized signed link prediction.
- Proposed a polarized embedding algorithm that captures both topological and signed similarity jointly via signed autocovariance.
- Extensive experiments showed that the proposed model outperforms state-of-the-art methods by up to one order of magnitude.

### **Graph Representation Learning Based on Random-walks**

Advisor: Prof. Ambuj Singh, Collaborator: Arlei Silva

Sep. 2018 - Feb. 2021

- · Presented a unified view of embedding, covering different random-walk processes, similarity metrics, and embedding algorithms.
- · Showed both theoretical and empirical evidence of the superiority of the novel autocovariance embedding in link prediction.
- Illustrated ways to exploit the multiscale nature of random-walk similarity to further optimize embedding performance.

# Teaching Experience \_\_\_\_\_

Lead Teaching Assistant, Department of Computer Science, UCSB	Sep. 2020 - Sep. 2021
Teaching Assistant, CS 130A, CS 8, CS 174A/174N, Department of Computer Science, UCSB	Sep. 2018 - Dec. 2019
Instructor, Machine Learning Workshops for LMU/UCSB Nanotech PhD Symposium	May. 2019 - Jun. 2019

## **Honors & Awards** \_

Top 10 best papers of WSDM'23 and best paper in the MLoG workshop	Feb. 2023
WSDM'22 NSF Travel Award	Feb. 2022
UCSB Computer Science Lead Teaching Assistant Fellowship	Sep. 2020
UCSB Computer Science Outstanding Scholar/Academic Excellence Fellowships	Sep. 2018
Outstanding Bachelor Thesis Award of UESTC	Jun. 2018
Most Outstanding Students Award of UESTC/Honorary Graduate of UESTC/Sichuan Province	Dec. 2017
National/People's/Tang Lixin Scholarships	Dec. 2015 - Jun. 2018
First Place in Sichuan Province, the 7th Chinese Mathematics Competitions	Nov. 2015

# **Academic Services**

**Registration Chair** KDD'23

**Program Committee** AAAI'23-25, KDD'22, SDM'22

Reviewer TNNLS'23, Neural Networks'23, TIST'22-24, TKDD'21-24, KDD'20-21, WebConf'21