

# Xiangchen Song

RESEARCH ASSISTANT · DATA MINING RESEARCHER

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## Research Interest

**Data Mining, Machine Learning** and **Bioinformatics**, with an emphasis on the minimum human effort for knowledge construction and application.

## Education Backgrounds

### UIUC (University of Illinois at Urbana-Champaign)

Champaign, IL, USA

B.S. IN MATHEMATICS AND COMPUTER SCIENCE

Aug. 2018 - Dec. 2020

- GPA: 4.0/4.0
- Class Rank: 1/132

### (Transferred out) CityU HK (City University of Hong Kong)

Kowloon Tong, Hong Kong

B.ENG. IN ELECTRONIC AND COMMUNICATION ENGINEERING

Aug. 2016 - Aug. 2018

- GPA: 4.12/4.3, Major GPA: 4.25/4.3
- Class Rank: 1/126, EE Department Honor Society Member.

## Honors & Awards

- Jan 2021 **SIGIR Student Travel Grant**, WSDM 2021 US
- Dec 2020 **Honorable Mention for CRA Outstanding Undergraduate Researchers Award 2021**, CRA US
- Apr 2020 **John R. Pasta Outstanding Undergraduate Award**, Department of Computer Science, UIUC Champaign, IL
- Jan 2018 **Compass Scholarship**, City University of Hong Kong Kowloon Tong, HK
- Sep 2016 **Entrance Scholarships for Non-Local Students**, City University of Hong Kong Kowloon Tong, HK
- 2018-2020 **Dean's List**, College of Liberal Arts & Sciences, UIUC Champaign, IL
- 2016-2018 **Dean's List**, College of Engineering, City University of Hong Kong Kowloon Tong, HK

## Publications & Preprints

### GRAPH MINING

\* DENOTES EQUAL CONTRIBUTION

- Di Jin\*, **Xiangchen Song**\*, Zhizhi Yu, Ziyang Liu, Heling Zhang, Zhaomeng Cheng, Jiawei Han. "BiTe-GCN: A New GCN Architecture via Bidirectional Convolution of Topology and Features on Text-Rich Networks". The ACM International Conference on Web Search and Data Mining (**WSDM**), 2021
- **Xiangchen Song**, Sha Li, Bangzheng Li, Jieyu Zhang, Jiawei Han, Hanghang Tong. "Expert Finding via Subgraph Similarity Search on HINs". (preprint)

### TEXT MINING

- Jieyu Zhang, **Xiangchen Song**, Ying Zeng, Jiaze Chen, Yuning Mao, Jiaming Shen, Lei Li. "Taxonomy Completion via Triplet Matching Network". The Thirty-Fifth AAAI Conference on Artificial Intelligence (**AAAI**), 2021
- **Xiangchen Song**, Jieyu Zhang, Chao Zhang. "Taxonomy Enlargement via Reinforcement Learning based Matching Network". (In preparation)
- **Xiangchen Song**, Jiaming Shen, Jiawei Han. "TaxoSort: Emerging Concept Sort in Taxonomy Expansion". (preprint)
- Sha Li\*, **Xiangchen Song**\*, Jieyu Zhang, Jiawei Han and Heng Ji. "Unsupervised Role Discovery". (preprint)

### BIOINFORMATICS

- Xuan Wang, **Xiangchen Song**, Bangzheng Li, Kang Zhou, Qi Li, Jiawei Han. "Fine-Grained Named Entity Recognized Dataset of COVID-19 Literature". IEEE International Conference on Bioinformatics and Biomedicine (**BIBM**) 2020, Short.
- Xuan Wang, **Xiangchen Song**, Bangzheng Li, Yingjun Guan and Jiawei Han. "Comprehensive Named Entity Recognition on COVID-19 with Distant or Weak Supervision". Intelligent Systems for Molecular Biology (**ISMB**) 2020 Abstracts (Oral and Poster)
- Xuan Wang, Yingjun Guan, Aabhas Chauha, Weili Liu, **Xiangchen Song**, Bangzheng Li, Ruisong Li, Vivian Hu, and Jiawei Han "EVIDENCEMINER: Textual Evidence Mining in COVID-19 Literature". under review
- Qingyun Wang, Manling Li, Xuan Wang, Nikolaus Parulian, Guangxing Han, Jiawei Ma, Jingxuan Tu, Ying Lin, Hao-ran Zhang, Weili Liu, Aabhas Chauhan, Yingjun Guan, Bangzheng Li, Ruisong Li, **Xiangchen Song**, Heng Ji, Jiawei Han, Shih-Fu Chang, James Pustejovsky, David Liem, Ahmed Elsayed, Martha Palmer, Jasmine Rah, Cynthia Schneider, Boyan Onyshkevych. "COVID-19 Literature Knowledge Graph Construction and Drug Repurposing Report Generation". (preprint)

## Research & Work Experience

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### GEORGIA INSTITUTE OF TECHNOLOGY

Advised by Prof. Chao Zhang.

#### Recursive Taxonomy Expansion via Reinforcement Learning

- Further extend the taxonomy expansion task to automatically expand with emerging concept.
- Introduce reinforcement learning to rank the emerging concepts.
- Utilize recursive pretrained model and use RL to finetune the performance.
- Advisor: Prof. Chao Zhang and Prof. Jiawei Han

Atlanta, GA

May. 2020 - now

### DATA MINING GROUP AT UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Research Assistant Advised by Prof. Jiawei Han.

#### Bidirectional Convolution of Topology and Features on Text-Rich Networks

- Construct bi-typed text-rich networks based on feature information
- Perform joint-convolution on both topology and features
- Test performance on real-word citation networks
- with: Prof. Di Jin, Advisor: Prof. Jiawei Han

Champaign, IL

May. 2020 - Aug. 2020

#### Named Entity Recognition study on COVID-19 Literature

- Develop seed guided distantly supervised Named Entity Recognition (NER).
- Ensemble multi-source NER result for fine-grained COVID-19 NER dataset
- with Xuan Wang, Bangzheng Li, Advisor: Prof. Jiawei Han and Prof. Qi Li

Champaign, IL

Mar. 2020 - Aug. 2020

#### Taxonomy Expansion with Emerging Concept Set

- Further develop the task and allow taxonomy structure generated within emerging concepts.
- Use self-supervision data to learn a model to generate a pseudo-order for taxonomy expansion.
- Compatible with state-of-the-art Taxonomy Expansion Models.
- with Jiaming Shen, Advisor: Prof. Jiawei Han

Champaign, IL

Feb. 2020 - Jun. 2020

#### Expert Finding via Subgraph Similarity Search on HINs

- Introduce a novel embedding-based graph similarity search ranking algorithm for expert finding.
- Learning node embedding utilizing random walk based embedding technique.
- Random projection to generate graph-embedding.
- Advisor: Prof. Jiawei Han and Prof. Hanghang Tong

Champaign, IL

Dec. 2019 - May. 2019

#### Unsupervised Role discovery

- End-to-end model for both schema induction and slot filling.
- Automatically discover important event-specific roles for unlabeled corpus.
- with Sha Li, Advisor: Prof. Jiawei Han and Prof. Heng Ji

Champaign, IL

Aug. 2019 - Mar. 2020

### CITY UNIVERSITY OF HONG KONG

Research Assistant Advised by Prof. Lin Dai.

#### Random Access Analysis

- Model and evaluate network performance of mixture of Aloha & CSMA System.
- Provide optimization method for given scenarios (Separated or overall performance).
- Advisor: Prof. Lin Dai

Kowloon Tong, Hong Kong

May. 2018 - Aug. 2018

## Teaching Experience

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- **Course Assistant**, CS473: Algorithms, UIUC, 2020 Spring.
- **Course Assistant**, CS374: Algorithms and Models of Computation, UIUC, 2020 Spring.
- **Course Assistant**, CS374: Algorithms and Models of Computation, UIUC, 2019 Fall.
- **Tutor**, EE Peer Tutoring Scheme, CityU HK, 2018 Spring.
- **Tutor**, EE Peer Tutoring Scheme, CityU HK, 2017 Fall.

## Services

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### PAPER REVIEWS

- *Humanities & Social Sciences Communications*.
- The International World Wide Web Conference (**WWW**), 2021.
- The International Conference on Web Information Systems Engineering (**WISE**), 2020.

## Extracurricular Activity

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- **President**, Calligraphantasy - Chinese Calligraphy Culture Development Society in Hong Kong, 2017-2018
- **Member**, City-Youth Empowerment Project(CYEP), Hong Kong, 2017-2018
- **Staff Member**, IMUNC Beijing - Mock United Nation in Beijing, 2017