

# Xiangchen Song

RESEARCH ASSISTANT · DATA MINING RESEARCHER

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## Research Interest

Data Mining with minimal human effort for automated knowledge construction.

## Education

### 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

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

Kowloon Tong, Hong Kong

B.ENG. IN ELECTRONIC AND COMMUNICATION

Aug. 2016 - Aug. 2018

- GPA: 4.12/4.3, Major GPA: 4.3/4.3
- Class Rank: 1/126

## Honors & Awards

- 2020 **John R. Pasta Outstanding Undergraduate Award**, Department of Computer Science, UIUC
- 2018 **Compass Scholarship**, City University of Hong Kong
- 2016 **Entrance Scholarships for Non-Local Students**, City University of Hong Kong
- 2018-2020 **Dean's List**, College of Liberal Arts & Sciences, UIUC
- 2016-2018 **Dean's List**, College of Engineering, CityU HK

Champaign, IL  
Kowloon Tong, HK  
Kowloon Tong, HK  
Champaign, IL  
Kowloon Tong, HK

## Publications

1. **Xiangchen Song\***, Di Jin\*, Zhizhi Yu, Ziyang Liu, Heling Zhang, Zhaomeng Cheng, Jiawei Han. "A New GCN Architecture via Bidirectional Convolution of Topology and Features on Text-Rich Networks". (In Submission)
2. Jieyu Zhang, **Xiangchen Song**, Ying Zeng, Jiaze chen, Yuning Mao, Jiaming Shen, Jiawei Han. "Taxonomy Enlargement via Triplet Matching Network". (In Submission)
3. **Xiangchen Song**, Jiaming Shen, Jiawei Han. "TaxoSort: Emerging Concept Sort in Taxonomy Expansion". (In Submission)
4. Xuan Wang, **Xiangchen Song**, Bangzheng Li, Kang Zhou, Qi Li, Jiawei Han. "Fine-Grained Named Entity Recognized Dataset of COVID-19 Literature". (In Submission)
5. Xuan Wang, **Xiangchen Song**, Bangzheng Li, Yingjun Guan and Jiawei Han. "Comprehensive Named Entity Recognition on COVID-19 with Distant or Weak Supervision". In Proceedings Of **Intelligent Systems for Molecular Biology (ISMB 2020 Abstracts) (Oral and Poster)**
6. **Xiangchen Song**, Jieyu Zhang, Jiawei Han, Chao Zhang. "Taxonomy Enlargement via Reinforcement Learning based Matching Network". (In preparation)
7. **Xiangchen Song**, Sha Li, Bangzheng Li, Jieyu Zhang, Jiawei Han, Hanghang Tong. "Expert Finding via Subgraph Similarity Search on HINs". (In preparation)
8. Sha Li\*, **Xiangchen Song\***, Jieyu Zhang, Jiawei Han, Heng Ji. "Unsupervised Role Discovery". (In preparation)
9. Qingyun Wang, Manling Li, Xuan Wang, Nikolaus Parulian, Guangxing Han, Jiawei Ma, Jingxuan Tu, Ying Lin, Haoran 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". (In preparation)

## Selected Course Work

- **Machine Learning & Data Mining:** Data Mining Principles\*, Advanced Topics in Information Retrieval\*, Network Mining\*, Introduction to Data Mining, Machine Learning
- **CS Core:** Data Structure, Computer Architecture, System Programming, Algorithms and Models of Computation, Numerical Methods, Algorithm\*, Numerical Analysis
- **MATH:** Calculus & Linear Algebra, Probability, Non-linear Programming, Differential Equations, Real Analysis, Introduction to Combinatorics

(\* denotes graduate-level courses)

## Research & Work Experience

### Taxonomy Expansion via Reinforcement Learning

GEORGIA INSTITUTE OF TECHNOLOGY

Atlanta, GA

May. 2020 - now

- Further extend the taxonomy expansion task to automatically expand with emerging concept.
- Introduce reinforcement learning to rank the emerging concepts.
- Advisor: Prof. Chao Zhang and Prof. Jiawei Han

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

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Champaign, IL

Mar. 2020 - Aug. 2020

- 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

### Taxonomy Expansion with Emerging Concept Set

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Champaign, IL

Feb. 2020 - Jun. 2020

- 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

### Expert Finding via Subgraph Similarity Search on HINs

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Champaign, IL

Dec. 2019 - May. 2019

- 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

### Unsupervised Role discovery

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Champaign, IL

Aug. 2019 - Mar. 2020

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

### NSCTA Text-Cube Demo Project

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Champaign, IL

Mar. 2019 - Sep. 2019

- Cleaning data and response for the algorithm part of the whole demo.
- Implement page-ranking-like algorithm to rank items.
- Utilize CaseOlap Algorithm for event cube construction.
- Advisor: Prof. Jiawei Han

### Differential Private Graph Generation

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Champaign, IL

Jan. 2019 - May. 2019

- Generating Graphs with differential privacy constraints.
- Collecting data and baseline comparison.
- with: Carl Yang and Haonan Wang, Advisor: Prof. Jiawei Han

### Random Access Analysis

CITY UNIVERSITY OF HONG KONG

Kowloon Tong, Hong Kong

May. 2018 - Aug. 2018

- 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

### Spherical Multidimensional Scaling

CITY UNIVERSITY OF HONG KONG

Kowloon Tong, Hong Kong

Nov. 2017 - Aug. 2018

- Using Spherical MDS to reconstruct the relationship of the original data.
- Advisor: Prof. Shuaicheng Li

## Teaching

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### University of Illinois at Urbana-Champaign

CS374 ALGORITHMS AND MODELS OF COMPUTATION, CS473 ALGORITHMS, COURSE ASSISTANT

Holding office hours, grading homework and answering questions on Piazza.

*Champaign, IL*

*Aug. 2019 - May. 2020*

### City University of Hong Kong

PEER TUTORING SCHEME, TUTOR

Hold weekly tutorial classes for freshman on Math & ECE classes.

*Kowloon Tong, Hong Kong*

*Sep. 2017 - May. 2018*

## Skills

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**Natural Languages** English, Chinese (Mandarin & Cantonese)

**Operating Systems** GNU/Linux, Mac OSX, Windows

**Programming Languages** Python, C/C++, Shell,  $\text{\LaTeX}$ , Git, Matlab, Haskell, Java

## Extracurricular Activity

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### Calligraphantasy - Chinese Calligraphy Culture Development Society in Hong Kong

PRESIDENT

Promote cultural exchange in Guangdong-Hong Kong-Macao Greater Bay Area together with Taiwan and S. Korea

*Hong Kong*

*2017 - 2018*

### IMUNC Beijing - Mock United Nation in Beijing 2017

STAFF MEMBER

Mock United Nation on The Belt and Road Initiative

*Beijing, China*

*Feb. 2017 - July. 2017*

### City-Youth Empowerment Project(CYEP)

MEMBER

Serve the underprivileged or special needs groups in the community.

*Hong Kong*

*2017 - 2018*