Chunjiang Zhu

Contact Information

Assistant Professor of Computer Science at UNC Greensboro
chunjiang.zhu@uncg.edu
317 College Avenue, 153 Petty Building, Greensboro, NC 27412
336.334.4374

Research Interests

Machine Learning; Theoretical Computer Science; Artificial Intelligence in Drug Discovery; Database Systems; Cyber-Physical Systems.

Education

UNIVERSITY OF CONNECTICUT, Storrs, CT *April 2018∼December 2020*
Postdoctor Research Associate *Postdoc Advisor: Jinbo Bi*

CITY UNIVERSITY OF HONG KONG, Hong Kong, PRC
Ph.D. in Computer Science awarded in February, 2015
Dissertation: Efficient Executions of Shortest Path Queries Using Data Broadcast
Advisor: Kam-Yiu Lam. GPA: 4.0/4.0.

CHINESE ACADEMY OF SCIENCES, Beijing, PRC
M.Eng. in Computer Science with Honour awarded in June, 2011

GUANGXI UNIVERSITY, Guangxi, PRC
B.Eng. in Computer Science with Honour awarded in June, 2008

Employment

UNIVERSITY OF NORTH CAROLINA GREENSBORO, Greensboro, NC *January 2021∼Present*
Assistant Professor of Computer Science

UNIVERSITY OF CONNECTICUT, Storrs, CT *April 2018∼December 2020*
Postdoctor Research Associate

WISERS AI LAB, Hong Kong, PRC *September, 2015∼November, 2017*
Researcher (from September, 2015-May, 2017), Senior Researcher (from June, 2017-November, 2017)

HONG KONG BAPTIST UNIVERSITY, Hong Kong, PRC *March, 2015∼August, 2015*
Postdoctor Research Fellow

CITY UNIVERSITY OF HONG KONG, Hong Kong, PRC *September, 2014∼February, 2018*
Research Assistant (September, 2014-February, 2015), Research Fellow (from December, 2017-February, 2018)

Grants

Natural Science Foundation (NSF). REU Site: Graph Learning and Network Analysis: from Foundations to Applications (GraLNA). Role: PI, Amount: $371,995, Period: 2024-2027. *Awarded*

UNCG College of Arts and Sciences Diversity Mini-Grants. Role: Co-PI, Amount: $500, Period: 2023-2024. *Awarded*

UNCG Faculty First Award. Pairwise Graph Sparsification Algorithms for Big Data Network Analytics, Role: PI, Amount: $5,000, Period: 2021-2023. *Awarded*

Honors

Jeffry D. Madura Memorial Graphics Prize for OctSurf paper (2022)
UNCG Faculty First Award (2021)
ICML Travel Award (2019)
Hong Kong Government Scholarship, City University of Hong Kong (2011-14)
Graduation with Honor, The Chinese Academy of Sciences (2011)
Exam Exemption, The Chinese Academy of Sciences (2008)
National Scholarship, 1/>300 (2007)

Conference and Journal Publications

In publications marked with *****, authors are ordered alphabetically according to the convention in the theory community. Authors marked with ⋄ are students under my supervision.

Machine Learning and Theory.

(1) Srilekha Geda ⋄ and Chun Jiang Zhu. (2024). Density-Preserving Heterogeneous Graph Sparsification for Representation Learning. To appear in Tiny Papers @ The 12th International Conference on Learning Representations (**ICLR 2024**).

(2) ***** Eli Stafford ⋄ and Chun Jiang Zhu. (2023). Improved Sourcewise Roundtrip Spanners with Constant Stretch. *The 29th International Computing and Combinatorics Conference (COCOON 2023); Proceedings:* 297–309.

(3) Haiyang Liu ⋄, Chun Jiang Zhu, Detian Zhang and Qing Li. (2023). Attention-based Spatial-Temporal Graph Convolutional Recurrent Networks for Traffic Forecasting. *The 19th International Conference on Advanced Data Mining and Applications (ADMA 2023); Proceedings:* 630–645.

(4) Detian Zhang, Lun Jin ⋄, Chun Jiang Zhu (Corresponding author) and Qing Li. (2023). Efficient Optimal Pick-up and Drop-off Point Selection for Ridehailing Systems. *2023 IEEE International Conference on Web Services (ICWS 2023); Proceedings:* 124–130.

(5) Xunlian Luo ⋄, Chun Jiang Zhu, Detian Zhang and Qing Li. (2023). Dynamic Graph Convolutional Network with Attention Fusion for Traffic Flow Prediction. *The 26th European Conference on Artificial Intelligence (ECAI 2023); Proceedings:* 1633–1640.

(6) Chun Jiang Zhu. (2023). Communication-Efficient Distributed Graph Clustering and Sparsification under Duplication Models. *The 13th International Symposium on Algorithms and Complexity (CIAC 2023); Proceedings:* 383–393.

(7) ***** Moritz Beck, Kam-Yiu Lam, Joseph Kee Yin Ng, Sabine Storandt and Chun Jiang Zhu. Concatenated k-Path Covers. *Int. J. Comput. Math. Comput. Syst. Theory* 8(1): 32–56, 2023.

(8) Chandan Chunduru ⋄, Chun Jiang Zhu, Blake Gaines and Jinbo Bi. (2022). Heterogeneous Graph Sparsification for Efficient Representation Learning. *The IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2022); Proceedings:* 1891–1896.

(9) Chun Jiang Zhu, Song Han and Kam-Yiu Lam. A Fast Algorithm for Source-Wise Round-Trip Spanners. *Theoretical Computer Science (***TCS***)*, 876, 34-44, 2021.

(10) Chun Jiang Zhu, Qinqing Liu and Jinbo Bi. Spectral Vertex Sparsifiers and Pair-Wise Spanners over Distributed Graphs. *Thirty-Eighth International Conference on Machine Learning (***ICML 2021***); Proceedings:* 12890–12900.

(11) Chun Jiang Zhu, Qinqing Liu and Jinbo Bi. Communication Efficient Distributed Hypergraph Clustering. *Forty-Fourth International ACM SIGIR Conference on Research and Development in Information Retrieval (***SIGIR 2021***); Proceedings:* 2131–2135.

(12) Tan Zhu, Guannan Liang, Chun Jiang Zhu and Jinbo Bi. Adaptive Strategies for Deep Stochastic Contextual Bandits. *To appear in Thirty-Fifth AAAI Conference on Artificial Intelligence (***AAAI 2021***).*

(13) Qianqian Tong, Guannan Liang, Xingyu Cai, Chun Jiang Zhu and Jinbo Bi. Asynchronous parallel stochastic Quasi-Newton methods. *Parallel Computing*, 101:102721, 2020.

(14) Guannan Liang, Qianqian Tong, Chun Jiang Zhu and Jinbo Bi. An Effective Hard Thresholding Method based on Stochastic Variance Reduction for Nonconvex Sparse Learning. *Thirty-Fourth AAAI Conference on Artificial Intelligence (***AAAI 2020***); Proceedings:* 1585-1592.

(15) Chun Jiang Zhu, Sabine Storandt, Kam-Yiu Lam, Song Han and Jinbo Bi. Improved Dynamic Graph Learning through Fault-Tolerant Sparsification. *Thirty-Sixth International Conference on Machine Learning (***ICML 2019***); Proceedings:* 7624–7633.

(16) Chun Jiang Zhu, Tan Zhu, Kam-Yiu Lam, Song Han and Jinbo Bi. Communication-Optimal Distributed Dynamic Graph Clustering. *Thirty-Third AAAI Conference on Artificial Intelligence (***AAAI 2019***); Proceedings:* 5957–5964.

(17) Chun Jiang Zhu, Kam-Yiu Lam, Joseph Kee Yin Ng and Jinbo Bi. On the VC-Dimension of Unique Round-Trip Shortest Path Systems. *Information Processing Letters*, 145:1–5, 2019.

(18) ***** Moritz Beck, Kam-Yiu Lam, Joseph Kee Yin Ng, Sabine Storandt and Chun Jiang Zhu. Concatenated k-Path Covers. *Twenty-First Workshop on Algorithm Engineering and Experiments (***ALENEX 2019***); Proceedings:* 81–91.

(19) Chun Jiang Zhu and Kam-Yiu Lam. Deterministic Improved Round-trip Spanners. *Information Processing Letters*, 129:57-60, 2018.

(20) Chung Keung Poon, Chun Jiang Zhu (Corresponding author) and Kam-Yiu Lam. Energy-efficient Air-indices for Shortest Path and Distance Queries on Road Networks, *Information Systems*, 71:182–198, 2017.

(21) Chun Jiang Zhu and Kam-Yiu Lam. Source-wise Round-trip Spanners. *Information Processing Letters*, 124:42-45, 2017.

(22) Chun Jiang Zhu, Kam-Yiu Lam, Song Han. Approximate Path Searching for Supporting Shortest Path Queries on Road Networks, *Information Sciences*, 325(C):409-428, 2015.

(23) Chun Jiang Zhu, Kam-Yiu Lam, Reynold C.K. Cheng and Chung Keung Poon. On Using Broadcast Index for Efficient Execution of Shortest Path Continuous Queries, *Information Systems*, 49(C):142-162, 2015.

(24) ***** Chung Keung Poon and Chun Jiang Zhu. Energy-efficient Air-indices for Distance Queries on Road Networks. *Twentieth International Conference on Advances on Geographic Information Systems (***ACM GIS 2012***); Proceedings:* 558-561.

Chemoinformatics and Drug Discovery.

(25) Qinqing Liu, Peng-Shuai Wang, Chun Jiang Zhu, Blake Gaines, Tan Zhu, Jinbo Bi and Minghu Song. OctSurf: Efficient Hierarchical Voxel-based Molecular Surface Representation for Protein-Ligand Affinity Prediction. *Journal of Molecular Graphics and Modelling*, 105, 107865, 2021.

(26) Chun Jiang Zhu, Minghu Song, Qinqing Liu, Chlo Becquey and Jinbo Bi. Benchmark on Indexing Algorithms for Accelerating Molecular Similarity Search. *Journal of Chemical Information and Modeling (***JCIM***)*, 60(12):6167-6184, 2020.

(27) Chun Jiang Zhu, Tan Zhu, Haining Li, Jinbo Bi and Minghu Song. Accelerating Large-Scale Molecular Similarity Search through Exploiting High Performance Computing. *2019 IEEE International Conference on Bioinformatics and Biomedicine (***BIBM 2019***); Proceedings:* 330-333.

Cyber-Physical Systems.

(28) Xiaofei Zhao, Kam-Yiu Lam, Chun Jiang Zhu, Chi-Yin Chow and Tei-Wei Kuo. MVLevelDB: Using Log-Structured Tree to Support Temporal Queries in IoT. *The IEEE Internet of Things (***IoT***) Journal*, 2022.

(29) Chun Jiang Zhu, Kam-Yiu Lam, Yuan-Hao Chang and Joseph Kee-Yin Ng. Linked Block-based Multiversion B-Tree Index for PCM-based Embedded Databases, *Journal of Systems Architecture*, 61(9):383-397, 2015.

(30) Kam-Yiu Lam, Chun Jiang Zhu, Yuan-Hao Chang, Jen-Wei Hiseh, Po-Chun Huang, Chung Keung Poon, Jiantao Wang. Garbage Collection of Multi-version Indexed Data on Flash Memory, *Journal of Systems Architecture*, 60(8):630-643, 2014.

(31) Kam-Yiu Lam, Jiantao Wang, Joseph Kee-Yin Ng, Song Han, Limei Zheng, Calvin Ho Chuen Kam and Chun Jiang Zhu. SmartMood: Towards Pervasive Mood Tracking and Analysis for Manic Episode Detection, *IEEE Transactions on Human-Machine Systems*, 45(1):126-131, 2014.

(32) Kam-Yiu Lam, Jiantao Wang, Yuan-Hao Chang, Jen-Wei Hiseh, Po-Chun Huang, Chung Keung Poon and Chun Jiang Zhu. Garbage Collection for Multi-version Index on Flash Memory. *2014 Design, Automation and Test in Europe (***DATE 2014***); Proceedings:* 1-4.

Miscellaneous Topics.

(33) Chun Jiang Zhu, Geyuan Ding, Yong Sun and Junying Jia. Design and implementation of group chat service in IMS Client. *Computer Engineering and Design*, 32(7):2509-2513, 2011.

(34) Chun Jiang Zhu, Yumin Lu, Taoshen Li, Hengbin Du and Sheng Tang. Design and Implementation of the Auto Classifier Based on Web Mining. *Journal of Guangxi Academy of Sciences*, 24(4):310-312,316, 2008.

Manuscripts Under Review

(34) Chun Jiang Zhu, Jing Deng and Jinbo Bi. (2023). Adversarial Perturbations on Graph Sparsification for Graph Machine Learning.

(35) Kam-Yiu Lam, Xiaofei Zhao, Chun Jiang Zhu and Tei-Wei Kuo. (2023). Meeting Temporal Consistency Requirements of Queries in Sensor Streams Databases.

Professional Services

Senior Program Committee Member:
Thirtieth International Joint Conference on Artificial Intelligence (**IJCAI 2021**)

Session Chair:
2019 IEEE International Conference on Bioinformatics and Biomedicine (**BIBM 2019**)

Program Committee Member:
Thirty-Eighth AAAI Conference on Artificial Intelligence (**AAAI 2024**);
Thirty-Seventh Annual Conference on Neural Information Processing Systems (**NeurIPS 2023**);
Fortieth International Conference on Machine Learning (**ICML 2023**);
Thirty-Second International Joint Conference on Artificial Intelligence (**IJCAI 2023**);
Thirty-Sixth Annual Conference on Neural Information Processing Systems (**NeurIPS 2022**);
Thirty-Ninth International Conference on Machine Learning (**ICML 2022**);
Thirty-First International Joint Conference on Artificial Intelligence (**IJCAI 2022**);
Thirty-Fifth Annual Conference on Neural Information Processing Systems (**NeurIPS 2021**);
Thirty-Eighth International Conference on Machine Learning (**ICML 2021**);
Thirty-Fifth AAAI Conference on Artificial Intelligence (**AAAI 2021**);
Thirty-Fourth Annual Conference on Neural Information Processing Systems (**NeurIPS 2020**);
Thirty-Seventh International Conference on Machine Learning (**ICML 2020**);
Thirty-Fourth AAAI Conference on Artificial Intelligence (**AAAI 2020**);
2020 IEEE International Conference on Bioinformatics and Biomedicine (**BIBM 2020**)
2019 IEEE International Conference on Bioinformatics and Biomedicine (**BIBM 2019**).

Reviewer:
IEEE Transactions on Knowledge and Data Engineering (**TKDE**);
IEEE Transactions on Computers (**TC**);
Forty-Seventh International Colloquium on Automata, Languages, and Programming (**ICALP 2020**);
Twenty-Fifth ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD 2019**);
Thirty-Second Annual Conference on Neural Information Processing Systems (**NIPS 2018**);
2018 IEEE Global Communications Conference (**GLOBECOM 2018**);
Thirty-First IEEE International Conference on Data Engineering (**ICDE 2015**).

Teaching Activities

Instructor:
CSC350 (Fall, 22): Foundations of Computer Science II, UNC Greensboro;
CSC429/629 (Fall 23, Spring 23, Fall, 22, Spring, 22, Fall, 21, Spring, 21): Artificial Intelligence, UNC Greensboro;
CSC452/652(Fall, 21): Theory of Computation, UNC Greensboro.
CSC730(Fall, 23): Advanced Topics in AI, UNC Greensboro.

Tutorial Instructor:
CS6492 (Fall, 13): Advanced Database Systems, City University of Hong Kong;
CS6492 (Fall, 12): Advanced Database Systems, City University of Hong Kong.

Teaching Assistant:

CS6223 (Spring, 14): Distributed System, City University of Hong Kong;
CS6492 (Fall, 13), Advanced Database Systems, City University of Hong Kong;
CS6492 (Fall, 12), Advanced Database Systems, City University of Hong Kong;
CS2311 (Spring, 13): Computer Programming, City University of Hong Kong;
CS2311 (Spring, 12): Computer Programming, City University of Hong Kong;
CS3334 (Fall, 11): Data Structures, City University of Hong Kong.

Undergraduate Students Supervision

Eli Stafford, University of North Carolina Greensboro. Developing Algorithms for 3-Sourcewise Roundtrip Spanners with Fast Computation Time.

Dominic Turmenne, University of North Carolina Greensboro. Developing Algorithms for Answering Approximate Shortest Path Graph Queries.

Andrew Kawabata, University of North Carolina Greensboro. Developing Adversarial Attack and Defense Algorithms for Graph Sparsification.

Nadia Doudou, University of North Carolina Greensboro. Developing Deep Learning-based Hypergraph Neural Sparsification.

Haining Li, University of Connecticut. Accelerating Large-Scale Molecular Similarity Search through Exploiting High Performance Computing.

Chris Nhat Phan, University of Connecticut. Design and Implementation of a Website for Publishing Benchmarking Results of Indexing Algorithms for Accelerating Molecular Similarity Search.

Conference Talks

- Efficient Optimal Pick-up and Drop-off Point Selection for Ridehailing Systems.
  At **ICWS 2023**, Virtual, July 2023.
- Heterogeneous Graph Sparsification for Efficient Representation Learning.
  At **BIBM 2022**, Las Vegas. December, 2022.
- Spectral Vertex Sparsifiers and Pair-Wise Spanners over Distributed Graphs.
  At **ICML 2021**, Virtual. July, 2021.
- Communication Efficient Distributed Hypergraph Clustering.
  At **SIGIR 2021**, Virtual. July, 2021.
- Accelerating Large-Scale Molecular Similarity Search through Exploiting High Performance Computing.
  At **BIBM 2019**, San Diego, CA, USA. November, 2019.
- Improved Dynamic Graph Learning through Fault-Tolerant Sparsification.
  At **ICML 2019**, Long Beach, CA, USA. June, 2019.
- Communication-Optimal Distributed Dynamic Graph Clustering.
  At **AAAI 2019**, Honolulu, HI, USA. January, 2019.
- Garbage Collection for Multi-version Index on Flash Memory.
  At **DATE 2014**, Dresden, Germany. March, 2014.
- Energy-efficient Air-indices for Distance Queries on Road Networks.
  At **ACM GIS 2012**, Redondo Beach, CA, USA. November, 2012.

References

Dr. Jinbo Bi
Professor
Associate Head
Department of Computer Science and Engineering, University of Connecticut
371 Fairfield Way, Unit 4155
Storrs, CT 06269-4155
860-486-1458
jinbo.bi@uconn.edu

Dr. Kam-Yiu Lam
Associate Professor
Department of Computer Science, City University of Hong Kong
83 Tat Chee Avenue, Kowloon
Hong Kong
(852)3442-9807
cskylam@cityu.edu.hk

Dr. Song Han
Associate Professor
Department of Computer Science and Engineering, University of Connecticut
371 Fairfield Way, Unit 4155
Storrs, CT 06269-4155
860-486-8771
song.han@uconn.edu