

Dr. Sheng Wang (王胜)

Associate Professor

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EDUCATION

- 2016.04 - 2019.08: **Doctor of Philosophy**, RMIT University, Australia
Supervisors: A/Prof. Zhifeng Bao, Prof. J. Shane Culpepper, Prof. Timos Sellis
Thesis: *Fast Trajectory Search for Real-world Applications*.
- 2013.09 - 2016.03: **Master of Engineering**, Nanjing University of Aeronautics and Astronautics (NUAA), Jiangsu, China
Thesis: *Research on Durable Main Memory Index Technology and Application*.
- 2009.09 - 2013.06: **Bachelor of Engineering**, Nanjing University of Aeronautics and Astronautics (NUAA), Jiangsu, China
Thesis: *Resource Scheduling Algorithm under Cloud Computing Environment*.

WORKING EXPERIENCE

- 2021.09-Present: **Associate Professor**, Wuhan University.
- 2019.09-2021.08: **Smart cities postdoc** at CUSP & ViDA, New York University.
Supervisors: Prof. Juliana Freire, Prof. Daniel B. Neill.
- 2019.08-2019.09: **Visiting scholar**, Nanyang Technological University.
- 2019.07-2019.08: **Research assistant** (full time), RMIT.

HONORS & AWARDS

2×best paper awards
3×top student awards
2×thesis awards
2×travel awards

- 2020 **Best Ph.D. Thesis Award** at RMIT School of Computing Technologies (also nominated for 2021 John Makepeace Bennett Award).
- 2017 **Best Paper Award** of Australasian Database Conference.
- 2015 **Best Paper Award** of ICCCS.
- 3 × TIGER/BDDA Group **Top Student Paper Awards** (\$3000 AUD).
- 2016 **Excellent Master Thesis Award** of NUAA.
- 2018 **ACM SIGIR Student Travel Grant** (\$2000 USD).
- 2017 **Travel Scholarship** for ACM 50th Celebration of the **Turing Award**.
- 2016 **First Prize Award** of 3 Minute Thesis Competition in School of Computer Science and Information Technology, RMIT University.
- 2016 **People's Choice Winner** of 3 Minute Thesis Competition in School of Computer Science and Information Technology, RMIT University.
- 2016 **Outstanding Graduate** of NUAA.
- 2015 **Huawei Scholarship** of NUAA.
- 2014 and 2015 **Advanced Individual in Research** of NUAA.
- 2014 **Committee Member of Graduate Student Union** of NUAA.
- 2013 **Postgraduate Scholarship** of NUAA.
- 2010 and 2012 **National Endeavor Scholarship** of China.
- 2010, 2011, 2012 and 2014 **Merit Student** of NUAA.
- 2010, 2011 and 2012 **Second-Class Scholarship** of NUAA.
- 2008 **Top ten outstanding students** at Tuanfeng High school (out of 3000 students).

TEACHING EXPERIENCE

- 2021 Summer: **Instructor**, *Machine Learning for Cities* (CUSP-GX-5003), NYU.
- 2020 Fall: **Guest lecture** on Clustering at “Big Data” of Prof. Juliana Freire, NYU.
- 2020 Spring: **Instructor**, *Machine Learning for Cities* (CUSP-GX-5003-002), NYU.
- 2018 Semester 2: **Lecturer & Offering Coordinator**, *Big Data Processing*, RMIT.
- 2018 Semester 1: **Tutor**, *Big Data Management*, RMIT (**OSI: 100%**).
- 2017 Semester 1: **Tutor**, *Big Data Infrastructure*, RMIT (**OSI: 88.9%**).
- 2015 Semester 2: **Lecturer**, *Java Programming*, Continuing Education College, NUAA.
- 2014 Semester 2: **Lecturer**, *Java Programming*, Continuing Education College, NUAA.

RESEARCH INTERESTS

- **Dataset Search and Augmentation.**
 - **Applications:** Data augmentation, Algorithm selection, Self-driving.
- **Fast and Fair Large-Scale Clustering.**
 - **Publications:** [PVLDB'21](#), [PVLDB'20](#).
 - **Applications:** Site selection, Traffic monitoring.
- **Trajectory-Driven Transport Planning.**
 - **Publications:** [SIGMOD'21](#), [TKDE](#), [WSDM'19](#), [ICDE'18](#).
 - **Applications:** Bus route planning, Route capacity estimation.
- **Trajectory Data Management.**
 - **Publications:** [SIGMOD'18](#), [SIGIR'18](#), [WSDM'18](#), [ICDE'17](#).
 - **Applications:** Green transport, Smart cities.

PREPRINT

- **Sheng Wang**, Yuan Sun, Songsong Mo, Juliana Freire. Fast and Memory-Efficient K-Means on Simplifying Large-Scale Point Clouds. (under review).
- Yuan Sun, **Sheng Wang**, Yunzhuang Shen, Xiaodong Li, Andreas T. Ernst, and Michael Kirley. Boosting Ant Colony Optimization via Solution Prediction and Machine Learning. (under review).

PUBLICATIONS Since 2017

8×A (CCF) + 1×ACM Computing Surveys + 2×WSDM

11×A* (CORE)

10 publications are in top-7 venues in the area of Databases & Information Systems, according to Google Scholar H5-index.

I am the first author of all these 11 papers.

- Yan Li, Liwei Wang, **Sheng Wang**, Yuan Sun, Zhiyong Peng. A Resource-Aware Deep Cost Model for Big Data Query Processing. **ICDE 2022**, to appear, (CORE A*, CCF A).
- **Sheng Wang**, Yuan Sun, Christopher Musco, Zhifeng Bao. Public Transport Planning: When Transit Network Connectivity Meets Commuting Demand. **SIGMOD 2021**, pp 1906-1919, Xi'an, Shaanxi, China (CORE A*, CCF A). (**Directly accepted without revision**)
- **Sheng Wang**, Zhifeng Bao, J. Shane Culpepper, Gao Cong. A Survey on Trajectory Data Management, Analytics, and Learning. **ACM Computing Surveys**, to appear (CORE A*, IF: 7.990)
- **Sheng Wang**, Yuan Sun, Zhifeng Bao. On the Efficiency of K-Means Clustering: Evaluation, Optimization, and Algorithm Selection. **PVLDB 2021** 14(2): 163 - 175, Copenhagen, Denmark (CORE A*, CCF A).
- **Sheng Wang**, Zhifeng Bao, J. Shane Culpepper, Timos Sellis, Xiaolin Qin. Fast Large-Scale Trajectory Clustering. **PVLDB 2020** 13(1): 29-42, Tokyo, Japan. (CORE A*, CCF A)

- **Sheng Wang**, Yunzhuang Shen, Zhifeng Bao, Xiaolin Qin. Intelligent Traffic Analytics: From Monitoring to Controlling. The 12th ACM International Conference on Web Search and Data Mining (**WSDM**), 2019, pp 778-781, Melbourne, Australia. (CORE A*, CCF B)
- **Sheng Wang**, Zhifeng Bao, J. Shane Culpepper, Zizhe Xie, Qizhi Liu, Xiaolin Qin. Torch: A Search Engine for Trajectory Data. The 41st International SIGIR Conference on Research & Development in Information Retrieval (**SIGIR**), 2018, pp 535-544, Ann Arbor Michigan, U.S.A. (CORE A*, CCF A. Acceptance rate: 21%, 86 out of 409 papers)
- **Sheng Wang**, Mingzhao Li, Yipeng Zhang, Zhifeng Bao, David Alexander Tedjopurnomoy, Xiaolin Qin. Trip Planning by an Integrated Search Paradigm. The ACM International Conference on Management of Data (**SIGMOD**), 2018, pp 1673-1676, Houston, U.S.A. (CORE A*, CCF A).
- **Sheng Wang**, Zhifeng Bao, J. Shane Culpepper, Timos Sellis, and Gao Cong. Reverse k Nearest Neighbor Search over Trajectories (Extended abstract). The 34st IEEE International Conference on Data Engineering (**ICDE**), 2018, pp 1785-1786, Paris, France. (CORE A*, CCF A).
- **Sheng Wang**, Zhifeng Bao, Shixun Huang, and Rui Zhang. A Unified Processing Paradigm for Interactive Location-based Web Search. The 11th ACM International Conference on Web Search and Data Mining (**WSDM**), 2018, pp 601-609, Los Angeles, U.S.A. (CORE A*, CCF B. Accepting rate: 16%, 84 out of 514 papers)
- **Sheng Wang**, Zhifeng Bao, J. Shane Culpepper, Timos Sellis, and Gao Cong. Reverse k Nearest Neighbor Search over Trajectories. *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 30(4): pp 757-771, 2018. (CORE A*, CCF A.)
- **Sheng Wang**, Zhifeng Bao, J. Shane Culpepper, Timos Sellis, Mark Sanderson, Xiaolin Qin. Answering Top-k Exemplar Trajectory Query. The 33st IEEE International Conference on Data Engineering (**ICDE**), 2017, pp 597-608, San Diego, U.S.A. (CORE A*, CCF A. Accepting rate: 17.7%, 63 out of 356 papers)
- **Sheng Wang**, Xiaolin Qin, Zhifeng Bao, Bohan Li. Tide-tree: a Self-tuning Indexing Scheme for Hybrid Storage System. *World Wide Web Journal* 2017, 20 (5), 1017-1045. (CORE A, CCF B).
- Munkh-Erdene Yadamjav, **Sheng Wang**, Zhifeng Bao, and Bang Zhang. Boosting Point-Based Trajectory Search with Quad-Tree. *ADC 2017*, pp 29-41, Brisbane, Australia. (**Best Paper Award**)

**PUBLICATIONS
BEFORE Ph.D.**

- **Sheng Wang**, Xiaolin Qin, Yao Shen, Bohan Li, Wenhao Shi. Research on Durable CSB+-Tree Indexing Technology. *Journal of Frontiers of Computer Science and Technology*, 2015, 9(2): 182-192.
- Yao Shen, Ping Lu, Xiaolin Qin, Yuming Qian, **Sheng Wang**. Efficient Query Algorithm of Coallocation-Parallel-Hash-Join in the Cloud Data Center. In *International Conference on Cloud Computing and Security*. Springer International Publishing, 306-320, 2015. (**Best Paper Award**)
- Yao Shen, Xiaolin Qin, **Sheng Wang**, Ning Wang. An Energy Management Strategy on IaaS. *Journal of Computational Information Systems*, 2014, 10(17): 7369-7381.
- Wenhao Shi, Guohua Jiang, Xiaolin Qin, **Sheng Wang**. Access control model research for HDFS based on user trust value. *Journal of Frontiers of Computer Science and Technology*, 2016, 10(1) : 25-35.

SYSTEMS & DEMOS

- Torch-trajectory: <https://github.com/tgbnhy/torch-trajectory>.
- T4 (traffic analytic system): <https://sites.google.com/site/shengwangcs/torch>.
- TISP (trip planning system): <https://sites.google.com/site/shengwangcs/tisp>.

PROFESSIONAL SERVICES

- **Grant Reviewer:**
 - Meta-reviewer for 2021 Climate Change AI Innovation Grants
- **Journal Reviewer:**
 - The VLDB Journal
 - IEEE Transactions on Knowledge and Data Engineering (TKDE)
 - IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
 - ACM Transactions on Intelligent Systems and Technology (TIST)
 - GeoInformatica
 - World Wide Web Journal (WWWJ)
 - Environment and Planning B: Urban Analytics and City Science
- **PC Member:**
 - PVLDB 2022: International Conference on Very Large Data Bases
 - IJCAI 2021-2024: International Joint Conferences on Artificial Intelligence
 - WSDM 2022: International Conference on Web Search and Data Mining
 - CIKM 2021: ACM International Conference on Information and Knowledge Management
 - APWeb-WAIM 2020-2018: International Joint Conference on Web and Big Data
 - ADC 2020, 2019: Australasian Database Conference
- **Membership:**
 - **ACM Professional Member**
- **External Conferences Reviewer:** SIGMOD 2021, 2018; VLDB 2018, 2017, 2016; ICDE 2019, 2018, 2017; SIGIR 2018, 2016.

INVITED TALKS

- 2020 Wuhan University, “Management & Applications of Large-scale Trajectory Data”
- 2019 HUST, “Management & Applications of Large-scale Trajectory Data”
- 2019 CUSP, NYU, “Management and Applications of Large-scale Trajectory Data”
- 2018 NUAA, “Torch: A Search Engine for Trajectory Data”
- 2017 NUAA, “Answering Top-k Exemplar Trajectory Query”

RESEARCH FUNDING

- **Sole investigator**, “Durable Main-memory Indexing Technology under Cloud Environment”, SJZZ_043, 2014 Funding of Jiangsu Province Innovation Program for Graduate Education, \$2000.

PATENTS

- Xiaolin Qin, **Sheng Wang**, Guangwei Zhu, Yao Shen, and Ning Wang. Database primary memory indexing method. Chinese Patent, **CN103823865A**.
- Xiaolin Qin, **Sheng Wang**, Wenhao Shi, Xiaoyi Wang, Bohan Li. Hybrid index structure with storage perception. Chinese Patent, **CN104899297A**.
- Xiaolin Qin, Wenhao Shi, and **Sheng Wang**. Access control model research for HDFS based on user trust value. Chinese Patent, CN104935590A.

REFERENCE

- Prof. Juliana Freire, Email: juliana.freire@nyu.edu, ACM Fellow.
- Prof. Timos Sellis, Email: tsellis@swin.edu.au, ACM Fellow.
- Prof. Zhifeng Bao, Email: zhifeng.bao@rmit.edu.au
- Prof. Gao Cong, Email: gaocong@ntu.edu.sg
- Prof. J. Shane Culpepper, Email: shane.culpepper@rmit.edu.au