Songtao He

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Education

Sept 2016 - May 2022 **Massachusetts Institute of Technology**
Ph.D in Computer Science
Advisor: Hari Balakrishnan
Thesis: Enriching Digital Maps with Aerial Imagery and GPS Data
Committee members: Hari Balakrishnan, Mohammad Alizadeh, and Samuel Madden

Sept 2016 - Sept 2018 **Massachusetts Institute of Technology**
M.S. in Electrical Engineering and Computer Science

Sept 2011 - Jun 2015 **University of Science and Technology of China**
B.E. in Computer Science and Technology

Research Interests

Quantitative Finance, Applied Machine/Deep Learning, Computer Systems, High-Performance Computing, Mobile and Sensing Systems, Urban Computing, and Smart Cities.

Experience

May 2022 - Present **Quantitative Researcher, Citadel Securities**
- Focus: Mid-Frequency Systematic Alpha Research for Equities
- I'm a full-stack alpha researcher with experience in open-ended alpha research, framework development, and alpha production.

Jun 2019 - Aug 2019 **Research Intern, Microsoft Research (Redmond)**
- Advisor: Sanjeev Mehrotra, Team: Mobility and Networking Group
- Project: Edge computing with Kubernetes

Aug 2015 - June 2016 **Visiting Scholar, Rice University**
- Advisor: Prof. Lin Zhong, Lab: Rice Efficient Computing Group (RECG)
- Project: Reducing Interaction Latency by Eliminating Synchrony in Android OS

Sept 2014 - June 2015 **Research Intern, Microsoft Research Asia (MSRA)**
- Advisor: Prof. Yunxin Liu, Lab: Wireless and Networking Group
- Project: Improving Smartphone Energy Efficiency

July 2014 - Aug 2014 **Research Intern, The University of Hong Kong (HKU)**
- Advisor: Prof. Cho-li Wang, Lab: Systems Research Group
- Project: Automatic Parallelization for GPU

Teaching

- TA, 6.858 Computer System Securities, Spring 2022
- TA, 6.S062 Mobile and Sensor Computing, Spring 2016

Professional Service

- Reviewer, Nature Machine Intelligence, 2023
- Reviewer, The European Conference on Computer Vision (ECCV), 2022
- Reviewer, IEEE CVF Winter Conference on Applications of Computer Vision (WACV), 2022
- Reviewer, International Conference on Learning Representations (ICLR), 2022
- Reviewer, Neural Information Processing Systems (NeurIPS), 2021
- Reviewer, IEEE International Conference on Computer Vision (ICCV), 2021
- External Reviewer, ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2021
- Reviewer, IEEE Transactions on Neural Networks and Learning Systems, 2021
- Reviewer, IEEE Conference on Computer Vision and Pattern Recognition(CVPR), 2021,2022
- Reviewer, AAAI Conference on Artificial Intelligence (AAAI), 2021, 2022
- Reviewer, ACM Transactions on Spatial Algorithms and Systems, 2020
- Reviewer, IEEE Transactions on Pattern Analysis and Machine Intelligence, 2019
- Reviewer, IEEE Geoscience and Remote Sensing Letters, 2019

Honors and Awards

- Best Demo Award, ACM MobiCom 2015
- Award of Excellence in the Microsoft Star of Tomorrow Internship Program (2015)
- Guo Moruo Scholarship, the highest honor of undergraduates at USTC (2015)
- 2nd Place Overall Winner, World Final, ISC14 Student Cluster Competition (2014)
- Google Excellence Scholarship (2014)
- National Scholarship, Ministry of Education, China (2012,2013)

Selected Publications (Reverse Chronological Order)

1. Songtao He, Hari Balakrishnan. "Lane-Level Street Map Extraction from Aerial Imagery" Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2022.

2. Songtao He, Mohammad Amin Sadeghi, Sanjay Chawla, Mohammad Alizadeh, Hari Balakrishnan, Samuel Madden. "Inferring High-Resolution Traffic Accident Risk Maps Based on Satellite Imagery and GPS Trajectories", The IEEE/CVF International Conference on Computer Vision (ICCV), 2021.

3. Songtao He, Favyen Bastani, Satvat Jagwani, Mohammad Alizadeh, Hari Balakrishnan, Sanjay Chawla, Mohamed M Elshrif, Samuel Madden, Mohammad Amin Sadeghi. "Sat2Graph: Road Graph Extraction through Graph-Tensor Encoding", European Conference on Computer Vision (ECCV), 2020.

4. Songtao He, Favyen Bastani, Arjun Balasingam, Karthik Gopalakrishna, Ziwen Jiang, Mohammad Alizadeh, Hari Balakrishnan, Michael Cafarella, Tim Kraska, Sam Madden. "BeeCluster: Drone Orchestration via Predictive Optimization", The 18th International Conference on Mobile Systems, Applications, and Services (MobiSys), 2020.

5. Favyen Bastani, Songtao He, Arjun Balasingam, Karthik Gopalakrishnan, Mohammad Alizadeh, Hari Balakrishnan, Michael Cafarella, Tim Kraska, Sam Madden. "MIRIS: Fast Object Track Queries in Video", The 2020 ACM SIGMOD International Conference on Management of Data (SIGMOD), 2020.

6. Songtao He, Favyen Bastani, Satvat Jagwani, Edward Park, Sofiane Abbar, Mohammad Alizadeh, Hari Balakrishnan, Sanjay Chawla, Samuel Madden, Mohammad Amin Sadeghi. "RoadTagger: Robust Road Attribute Inference with Graph Neural Networks", The AAAI Conference on Artificial Intelligence (AAAI), 2020.

7. Songtao He, Favyen Bastani, Sofiane Abbar, Mohammad Alizadeh, Hari Balakrishnan, Sanjay Chawla, Sam Madden. "RoadRunner: Improving the Precision of Road Network Inference from GPS Trajectories", The 26th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL), 2018.

8. Favyen Bastani, Songtao He, Sofiane Abbar, Mohammad Alizadeh, Hari Balakrishnan, Sanjay Chawla, Sam Madden, David DeWitt. "RoadTracer: Automatic Extraction of Road Networks from Aerial Images", The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018.

9. Min Hong Yun, Songtao He, Lin Zhong. "Reducing Latency by Eliminating Synchrony", The 26th International Conference on World Wide Web (WWW), 2017.

10. Songtao He, Yunxin Liu, Hucheng Zhou. "Optimizing Smartphone Power Consumption through Dynamic Resolution Scaling", The 21st Annual International Conference on Mobile Computing and Networking (MobiCom), 2015.