

# ZHE JIANG

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## RESEARCH INTERESTS

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Data Mining and Knowledge Discovery, Spatial Big Data Analytics, Spatial and Spatiotemporal Data Mining, Spatial Database, Geographic Information System

## EDUCATION

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**University of Minnesota, Twin Cities** August 2016

Ph.D. in Computer Science

Thesis: Spatial Big Data Analytics: Classification Techniques for Earth Observation Imagery

**University of Science and Technology of China, Hefei, China** July 2010

B.E. in Electrical Engineering

## APPOINTMENT

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- Assistant Professor, Department of Computer Science, University of Alabama, Tuscaloosa, AL, USA, since August 2016.

## AWARDS AND HONORS

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- Doctoral Dissertation Fellowship, University of Minnesota, Twin Cities, 2015 - 2016.
- NSF Travel Award: IEEE ICDM 2014-2015, ACM SIGSPATIAL 2012, 2015, SSTD 2011

## TEACHING EXPERIENCE

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### Ph.D. Advisees

- Mr. Arpan Man Sainju, joined in 2016, passed Ph.D. qualifying exam in 2017
- Mr. Miao Xie, joined in 2016, passed Ph.D. qualifying exam in 2018

### Courses Taught

- CS 491/591: Special Topics in Computer Science, Data Science, Fall 2018.
- CS 491/591: Special Topics in Computer Science, Spatial Computing, Spring 2018.
- CS 491/591: Special Topics in Computer Science, Data Mining, Fall 2017.
- CS 491/591: Special Topics in Computer Science, Spatial Big Data, Spring 2017.

## PUBLICATIONS

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### Books

1. **Zhe Jiang**, Shashi Shekhar: “Spatial Big Data Science - Classification Techniques for Earth Observation Imagery”. Springer 2017, ISBN 978-3-319-60194-6, pp. 1-131

### Journal Papers

1. Arpan Man Sainju, Daniel Aghajarian, **Zhe Jiang**, Sushil Prasad, “Parallel Grid-based Colocation Mining Algorithms on GPUs for Big Spatial Event Data”, IEEE Transactions on Big Data, 2018 (accepted).
2. **Zhe Jiang**, “A Survey on Spatial Prediction Methods”, IEEE Transactions on Knowledge and Data Engineering, 2018, DOI 10.1109/TKDE.2018.2866809. (accepted)

3. Anuj Karpatne, **Zhe Jiang**, Ranga Raju Vatsavai, Shashi Shekhar, Vipin Kumar, "Monitoring Land Cover Changes using Remote Sensing Data: A Machine Learning Perspective." Special Issue on Advances in Machine Learning for Remote Sensing and Geosciences, IEEE Geoscience and Remote Sensing Magazine, 4(2), pp. 8-21. 2016.
4. **Zhe Jiang**, Michael Evans, Dev Oliver, Shashi Shekhar. "Identifying K Primary Corridors from Urban Bicycle GPS Trajectories on a Road Network." Special Issue on Mining Urban Data, Information Systems Journal, Elsevier, 57, pp. 142-159, 2016.
5. Emre Eftelioglu, **Zhe Jiang**, Shashi Shekhar, "Spatial Computing Perspective on Food Energy and Water Nexus." Special Issues on the Food-Energy-Water Nexus, Journal of Environmental Studies and Sciences, Springer, 6(1), pp. 62-76, 2016.
6. **Zhe Jiang**, Shashi Shekhar, Xun Zhou, Joseph Knight, Jennifer Corcoran: "Focal-Test-Based Spatial Decision Tree Learning". IEEE Transactions on Knowledge and Data Engineering (TKDE) 27(6), pp. 1547-1559, 2015.
7. Shashi Shekhar, **Zhe Jiang**, Reem Ali, Emre Eftelioglu, Xun Tang, Viswanath Gunturi, Xun Zhou, "Spatiotemporal Data Mining: A Computational Perspective", Special Issue on Advances in Spatio-Temporal Data Analysis and Mining, ISPRS International Journal of Geo-Information, 4(4), pp. 2306-2338, 2015.

### Conference and Workshop Papers

1. Miao Xie, **Zhe Jiang**, and Arpan Man Sainju. 2018. Geographical Hidden Markov Tree for Flood Extent Mapping. In KDD 18: The 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining, August 19-23, 2018, London, United Kingdom. ACM, New York, NY, USA, 10 pages. <https://doi.org/10.1145/3219819.3220053> (acceptance ratio: 10%)
2. Aibek Musaev, **Zhe Jiang**, Steven Jones, Pezhman Sheinidashtegol, Mirbek Dzhumaliev, "Detection of Damage and Failure Events of Road Infrastructure Using Social Media", International Conference on Web Services, Springer, pp. 134-148, 2018.
3. **Zhe Jiang**, Yan Li, Shashi Shekhar, Lian Rampi, Joe Knight, "Spatial Ensemble Learning for Heterogeneous Geographical Data with Class Ambiguity: A Summary of Results", ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM GIS), 2017.
4. Benjamin Romano, **Zhe Jiang**, "Visualizing Traffic Accident Hotspots Based on Spatial-Temporal Network Kernel Density Estimation (Demo Paper)", ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM GIS), 2017.
5. Arpan Man Sainju, **Zhe Jiang**, "Grid-based Colocation Mining Algorithms on GPU for Big Spatial Event Data: A Summary of Results", Symposium on Spatial and Temporal Database (SSTD), pp. 263-280, Springer, 2017.
6. Sarnath Ramnath, **Zhe Jiang**, Hsuan-Heng Wu, Venkata MV Gunturi, and Shashi Shekhar. "A Spatio-Temporally Opportunistic Approach to Best-Start-Time Lagrangian Shortest Path." In Proceedings of Advances in Spatial and Temporal Databases (SSTD), pp. 274-291. Springer International Publishing, 2015.
7. **Zhe Jiang**, Shashi Shekhar, Azamat Kamzin, Joseph Knight. "Learning A Spatial Ensemble of Classifiers for Raster Classification: A Summary of Results." International Workshop on Spatial and Spatiotemporal Data Mining (SSTDM-14) in cooperation with IEEE ICDM 2014.
8. **Zhe Jiang**, Shashi Shekhar, Xun Zhou, Joseph Knight, and Jennifer Corcoran. "Focal-test-based spatial decision tree learning: a summary of results." In Proceedings of International Conference on Data Mining (ICDM), pp. 320-329. IEEE, 2013.
9. **Zhe Jiang**, Shashi Shekhar, Pradeep Mohan, Joseph Knight, and Jennifer Corcoran. "Learning spatial decision tree for geographical classification: a summary of results." In Proceedings of the 20th International Conference on Advances in Geographic Information Systems, pp. 390-393. ACM, 2012.

10. Pradeep Mohan, Shashi Shekhar, James A. Shine, James P. Rogers, **Zhe Jiang**, and Nicole Wayant. "A neighborhood graph based approach to regional co-location pattern discovery: A summary of results." In Proceedings of the 19th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS), pp. 122-132. ACM, 2011.

### Book Chapters

1. Shashi Shekhar, **Zhe Jiang**, James Kang, Vijay Gandhi, "Spatial Data Mining", Book chapter in Encyclopedia of Database Systems, 2017.
2. Shashi Shekhar, Yan Li, Reem Ali, Emre Eftelioglu, Xun Tang, **Zhe Jiang**, "Spatial and Spatiotemporal Data Mining", Book chapter in "Comprehensive Geographic Information Systems", 264-286, Elsevier, 2017.
3. Reem Y. Ali, Viswnath Gunturi, **Zhe Jiang**, Shashi Shekhar, "Emerging Applications of Spatial Network Big Data in Transportation." Book chapter in Big Data and Computational Intelligence in Networking. Taylor & Francis LLC, CRC Press, December 2017.
4. Emre Eftelioglu, **Zhe Jiang**, Xun Tang, and Shashi Shekhar. The Nexus of Food, Energy, and Water Resources: Visions and Challenges in Spatial Computing". Book Chapter In Advances in Geocomputation (pp. 5-20). Springer, Cham, 2017.
5. **Zhe Jiang**, "Focal-Test-Based Spatial Decision Tree". Book chapter in Springer Encyclopedia of GIS: 622-627, 2017.

### INVITED TALKS

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- Dec 3, 2018, Department of Computer Science, Missouri University of Science and Technology, Rolla, MO, "Geospatial Data Science Techniques for Earth Science Applications"
- Aug 16, 2018, Anhui Province Key Laboratory of Big Data Analysis and Application, School of Computer Science and Technology, University of Science and Technology of China (USTC), Hefei, China, "Disciplinary Knowledge Guided Spatial Structured Models for Geoscience Applications"
- April 25, 2018, Department of Computer Science and Engineering, Texas A&M University, College Station, TX, "Geospatial Data Science Techniques for Earth Science Applications"
- March 9, 2018, Distributed & Mobile Systems Lab, Department of Computer Science, Georgia State University, Atlanta, GA, "Geospatial Data Science Algorithms for Applications in Earth Science and Public Safety"
- March 2, 2018, University of Alabama Birmingham (UAB), Birmingham, AL, "CS + Neural Science Seminar for Potential Collaborations"
- October 23-24, 2017, Poster Session on Computing Research: Addressing National Priorities and Societal Needs, Washington DC, "Utilizing Spatial Data Science Techniques in Intelligent Infrastructure for Flood Disaster Management"
- July 13, 2017, Alabama Summer Computer Camps, University of Alabama, Tuscaloosa, "Introduction to Data Science"
- April 25, 2017, American Society for Photogrammetry and Remote Sensing (ASPRS) Chapter at Mississippi State University, "Mining Earth Observation Imagery Big Data : A Computational Perspective"
- October 18, 2016, ACM Student Chapter, University of Alabama, Tuscaloosa, "Spatial Big Data Analytics: Classification Techniques for Earth Observation Imagery"
- September 16, 2016, Applied Math Seminar, Department of Mathematics, University of Alabama, Tuscaloosa, "Spatial Big Data Analytics: Classification Techniques for Earth Observation Imagery"
- September 23, 2016, Department of Computer Science Seminar, University of Alabama Birmingham, "Spatial Big Data Analytics: Classification Techniques for Earth Observation Imagery"

- September 9, 2016, NASA Marshall Space Flight Center, Huntsville, AL, “Spatial Big Data Analytics: Classification Techniques for Earth Observation Imagery”

## **RESEARCH GRANT**

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### **Awarded**

- PI, NVIDIA GPU Research Grant, “Utilizing GPUs in Spatial Big Data Classification for Flood Mapping”, a gift NVIDIA P6000 GPU (worth around \$5000), Feb 2018.
- Co-PI, University Corporation for Atmospheric Research (UCAR), U.S. Dept. of Commerce, “Center for Remote Sensing of Snow and Soil Moisture Measurements”, total \$5m, my credit 5%, June 2018.

## **PROFESSIONAL ACTIVITIES**

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### **Conference Organization**

- Publicity Co-Chair, ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, 2019
- Best Poster Award Committee, ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, 2018
- Program Co-Chair, the 12th IEEE International Workshop on Spatial and Spatiotemporal Data Mining (SSTD-17), In Cooperation with IEEE International Conference on Data Mining (ICDM) 2017, New Orleans, USA
- Demo Session Award Committee, International Symposium on Spatial and Temporal Databases (SSTD), Arlington, VA, 2017
- Co-chair of Junior Faculty Workshop, International Symposium on Spatial and Temporal Databases (SSTD), Arlington, VA, 2017. The workshop invited two NSF Program Managers on CISE CRRI and CAREER, Smart & Connected Community to mentor young investigators.

### **Program Committee**

- AAAI Conference on Artificial Intelligence (AAAI), 2019
- International Conference on Services Computing (SCC), 2019
- ACM SIGSPATIAL Advances in Geographic Information Systems, 2018
- IEEE International Conference on Data Mining (ICDM), 2018
- IEEE International Conference on Tools with Artificial Intelligence (ICTAI), 2018
- ACM International Conference on Information and Knowledge Management (CIKM), 2018
- ACM SIGKDD Urban Computing Workshop 2018
- ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2018
- AAAI Conference on Artificial Intelligence (AAAI), 2018.
- ACM International Conference on Information and Knowledge Management (CIKM), 2017
- IEEE International Conference on Tools with Artificial Intelligence (ICTAI), 2017.
- ACM SIGSPATIAL Student Research Competition, 2017.
- ACM SIGSPATIAL Workshop on Analytics for Local Events and News (LENS), 2017.
- ACM SIGSPATIAL Advances in Geographic Information Systems, 2017
- International Symposium on Spatial and Temporal Databases, 2017
- ACM SIGSPATIAL Advances in Geographic Information Systems, 2016

- International Conference on CyberGIS and Geospatial Data Science (CyberGIS), 2016
- IEEE International Workshop on Spatial and Spatiotemporal Data Mining (SSTDM) 2016, co-organized with IEEE International Conference on Data Mining (ICDM) 2016

### **Journal Reviewer**

- ACM Transactions on Spatial Algorithms and Systems, 2018
- IEEE Transactions on Knowledge and Data Engineering (TKDE), 2018, 2017, 2015
- Knowledge and Information Systems (KAIS), Springer, 2018
- MDPI Geosciences, 2018
- MDPI Sensors, 2018
- IEEE Transactions on Big Data (TBD), 2018, 2017
- IEEE Transactions on Vehicle Technologies (TVT), 2018
- ACM Transactions on Intelligent Systems and Technology (TIST), 2018, 2017
- MDPI Remote Sensing Journal, 2017
- IEEE Transactions on Systems, Man and Cybernetics, 2017
- Springer Geo-Informatica, 2018, 2017
- MDPI Energies Journal, 2017
- Elsevier, Engineering Applications of Artificial Intelligence, the International Journal of Intelligent Real-Time Automation, 2017, 2014
- Data Science Journal, 2016
- IEEE Transactions on Geoscience and Remote Sensing (TGRS), 2016
- AIAA, Journal of Aerospace Information Systems (JAIS), 2015.

### **Proposal Panelist/Reviewer**

- External Reviewer, Research Grants Council (RGC) of Hong Kong, 2018
- NASA Panel, 2018
- NSF Panel and Adhoc Reviewer, 2016, 2017

### **Thesis Committee**

- Ziye Liu, Department of Mechanical Engineering, Ph.D. Thesis Defense Committee, 2018, Advisor Yuebin Guo
- Xin Zhao, Department of Computer Science, Ph.D. Thesis Proposal Exam Committee, 2018, Advisor Dr. Jeff Gray
- Meng Kuai, Department of Computer Science, Ph.D. Thesis Defense, 2018, Advisor Xiaoyan Hong
- Ziye Liu, Department of Mechanical Engineering, Ph.D. Thesis Proposal Exam Committee, 2018, Advisor Yuebin Guo
- Pawan Subedi, Department of Computer Science, Ph.D. Qualifying Exam Committee, 2018, Advisor Dr. Xiaoyan Hong
- Hao Wu, Department of Geological Science, Ph.D. Thesis Proposal Exam Committee, 2018, Advisor Dr. Bo Zhang
- Kuai Meng, Department of Computer Science, Ph.D. Thesis Proposal Exam Committee, 2016, Advisor Dr. Xiaoyan Hong