

## RESEARCH INTERESTS

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GeoAI, Machine Learning/Deep Learning, Fairness-aware AI, Data Science, Data Mining, Geospatial Information Science, Spatio-Temporal Data

## EDUCATION

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**University of Minnesota** Minneapolis, MN, US  
Ph.D. in Computer Science 2020  
Thesis: “GeoAI: Challenges and Opportunities”  
Advisor: Shashi Shekhar

## PROFESSIONAL EXPERIENCE

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**University of Maryland** College Park, MD  
Assistant Professor in Geospatial Information Science 2020–Current  
Center for Geospatial Information Science  
Department of Geographical Sciences

## HONORS & AWARDS

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- **Best Paper Award**, IEEE International Conference on Data Mining (ICDM) 2021
- **Best Application Paper Award**, SIAM International Conference on Data Mining (SDM) 2023
- **Best Presentation - Honorable Mention**, Google’s AI for Social Good mid-program meeting 2022
- **Best Paper Award**, ACM SIGSPATIAL BigSpatial Workshop 2022
- **Winner (Top-3)**, ACM SIGSPATIAL GIS Cup Competition 2022
- **Best Paper Award**, SSTD 2019
- **Best Vision Paper Award**, ACM SIGSPATIAL 2019
  - Highlighted by the Great Innovative Ideas program of the Computing Community Consortium at CRA
- **Best Paper Award**, ACM SIGKDD DeepSpatial Workshop 2020
- **Best Poster Award**, Symposium of UCGIS 2017
- **Outstanding Student of the Year**, Esri Development Center at University of Minnesota 2014
- **Finalist Award**, Annual Figure of College Students in China (200 awardees) 2012

## FUNDING

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- **UMD PI, NSF/Amazon**, (2147195), \$755,098 (UMD share: \$424,774; collaborative with the University of Pittsburgh), “FAI: Advancing Deep Learning Towards Spatial Fairness”, 2022-2025.

- **PI, NASA** (80NSSC22K1164), \$599,956, “Coupled Statistics-Physics Guided Learning to Harness Heterogeneous Earth Data at Large Scales”, *Advanced Info. Sys. Tech.*, 2022-2024.
- **PI, NSF** (2126474), \$955,837, “Collaborative Research: EarthCube Capabilities: ICESpark: An Open-Source Big Data Platform for Science Discoveries in the New Arctic and Beyond”, 2021-2024 (collaborative with WSU: \$1.24M overall)
- **PI, NSF** (2105133), \$174,983, “CRII: III: Discovering Complex Mixture Patterns in Spatial Data to Advance Resilience of Communities”, 2021-2023
- **Co-I, NASA** (80NSSC21K0314), \$747,164, “High-Impact Hot Spots of Land Cover Land Use Change: Ukraine and Neighboring Countries”, 2021-2023 (PI: Sergii Skakun)
- **PI, Google**: “Greener Amazon: Combating Illegal Deforestation at Scale with Novel AI and Satellite Imagery”, 2023-2024
- **PI, Google**: “Leave No One Behind: Spatial AI Enabled Settlement Mapping to Enhance WASH Access for Vulnerable Populations”, 2021-2022
- **Team member, UMD Grand Challenges Grant** (Team Project), \$366,000 (minimum), “Remediation of Methane, Water, and Heat Waste,” 2023-2026
- **PI, UMD FSRA Seed Grant**, “The Spatial Pattern of Success: What Makes Small Businesses Grow Better in Certain Areas?”, 2023-2024
- **PI, UMD DRI Seed Grant**, “Transforming Deep Learning with Spatial Awareness”, 2021-2023

## PUBLICATIONS

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### Journals (Peer-Reviewed)

- [1] Erhu He\*, **Yiqun Xie\***, Weiye Chen\*, Sergii Skakun, Han Bao, Rahul Ghosh, Praveen Ravirathinam and Xiaowei Jia.  
Learning with Location-based Fairness: A Statistically-Robust Framework and Acceleration.  
*Accepted by: IEEE Transactions on Knowledge and Data Engineering (TKDE)*. 2024. (impact factor: 8.9)
- [2] **Yiqun Xie**, Shashi Shekhar and Yan Li.  
Statistically-Robust Clustering Techniques for Mapping Spatial Hotspots: A Survey.  
*ACM Computing Surveys (CSUR)*. 2022. (impact factor: 16.6)
- [3] **Yiqun Xie\***, Weiye Chen\*, Erhu He\*, Xiaowei Jia, Han Bao, Xun Zhou, Rahul Ghosh and Praveen Ravirathinam.  
Harnessing Heterogeneity in Space with Statistically-Guided Meta-Learning.  
*Knowledge and Information Systems (KAIS)*. Springer. 2023.
- [4] Shengyu Chen, Nasrin Kalanat, **Yiqun Xie**, Sheng Li, Jacob Zwart, Jeffrey Sadler, Alison Appling, Samantha Oliver, Jordan Read and Xiaowei Jia.  
Physics-Guided Machine Learning from Simulated Data with Different Physical Parameters.  
*Knowledge and Information Systems (KAIS)*. Springer. 2023.
- [5] **Yiqun Xie**, Xiaowei Jia, Han Bao, Xun Zhou and Shashi Shekhar.  
Significant DBSCAN+: Statistically Robust Density-based Clustering.  
*ACM Transactions on Intelligent Systems and Technology (TIST)*. 12(5). 2021. (impact factor: 10.489)
- [6] Han Bao, Xun Zhou, **Yiqun Xie**, Yingxue Zhang and Yanhua Li.

- COVID-GAN+: Estimating Human Mobility Responses to COVID-19 through Spatio-Temporal Generative Adversarial Networks with Enhanced Features.  
*ACM Transactions on Intelligent Systems and Technology (TIST)*. 13(2). 2022. (impact factor: 10.489)
- [7] Jayant Gupta, Carl Molnar, **Yiqun Xie**, Joseph Knight and Shashi Shekhar.  
Spatial Variability Aware Deep Neural Networks (SVANN): A General Approach.  
*ACM Transactions on Intelligent Systems and Technology (TIST)*. 12(6). 2021. (impact factor: 10.489)
- [8] Zhihao Wei, Kebin Jia, Pengyu Liu, Xiaowei Jia, **Yiqun Xie**, and Zhe Jiang.  
Large-Scale River Mapping Using Contrastive Learning and Multi-Source Satellite Imagery.  
*Remote Sensing*. 13(15): 2893. 2021. (impact factor: 5.349)
- [9] **Yiqun Xie** and Shashi Shekhar.  
A Unified Framework for Robust and Efficient Hotspot Detection in Smart Cities.  
*ACM/IMS Transactions on Data Science (TDS)*. 1(3). 2020.
- [10] **Yiqun Xie**, Xun Zhou and Shashi Shekhar.  
Discovering Interesting Spatio-temporal Sub-path with Statistical Significance.  
*ACM Transactions on Intelligent Systems and Technology (TIST)*. 11(1). 2020. (impact factor: 10.489)
- [11] Jiannan Cai, Min Deng, Yiwen Guo, **Yiqun Xie** and Shashi Shekhar.  
Discovering regions of anomalous spatial co-locations.  
*International Journal of Geographical Information Science (IJGIS)*. 2020. (impact factor: 4.186)
- [12] Yan Li, Pratik Kotwal, Pengyue Wang, **Yiqun Xie**, Shashi Shekhar and William Northrop.  
Physics-guided Energy-efficient Path Selection Using on-board diagnostics Data.  
*ACM/IMS Transactions on Data Science*. 1(3). 2020.
- [13] Jiannan Cai, **Yiqun Xie**, Min Deng and Shashi Shekhar.  
Significant spatial co-distribution pattern discovery.  
*Computers, Environment and Urban Systems*. 2020. (impact factor: 5.324)
- [14] **Yiqun Xie**, Jiannan Cai, Rahul Bhojwani, Shashi Shekhar and Joseph Knight.  
A Locally Constrained Deep Learning Framework for Detecting Small and Densely Distributed Building Footprints.  
*International Journal of Geographic Information Science (IJGIS)*. 2019. (impact factor: 5.152)
- [15] **Yiqun Xie**, Emre Eftelioglu, Reem Ali, Xun Tang, Yan Li, Ruhi Doshi and Shashi Shekhar.  
Transdisciplinary Foundations of Geospatial Data Science.  
*ISPRS International Journal of Geo-Information*. 2017, 6(12). (impact factor: 3.388)
- [16] **Yiqun Xie**, Bryan Runck, Shashi Shekhar, Len Kne, David Mulla, Nicholas Jordan and Peter Waringa.  
Collaborative Geodesign and Spatial Optimization for Fragmentation-Free Land Allocation.  
*ISPRS International Journal of Geo-Information*. 2017, 6(7). (impact factor: 3.388)
- [17] **Yiqun Xie**, Guoan Tang, Shijiang Yan and Hui Lin.  
Crater detection using the morphological characteristics of Chang'E-1 digital elevation models  
*IEEE Geoscience and Remote Sensing Letters*. 10(4), June 2013. (impact factor: 5.343)

### Conference Proceedings (Peer-Reviewed)

\*By both selectivity and impact, computing conferences are considered as important as journals ([National Academies Press](#)). For example, most revolutionizing AI/deep learning methods – such as Transformer (the architecture used in ChatGPT), ResNet, GAN & U-Net – are published in conferences.

- [18] Zhihao Wang, **Yiqun Xie**, Zhili Li, Xiaowei Jia, Zhe Jiang, Aolin Jia and Shuo Xu.  
SimFair: Physics-Guided Fairness-Aware Learning with Simulation Models.  
*Accepted by: The 38th AAAI Conference on Artificial Intelligence (AAAI'24)*. Vancouver, Canada. 2024.  
(acceptance rate: 24%)
- [19] Weiye Chen, **Yiqun Xie**, Xiaowei Jia, Erhu He, Han Bao, Bang An and Xun Zhou.  
Referee-Meta-Learning for Fast Adaptation of Locational Fairness.  
*Accepted by: The 38th AAAI Conference on Artificial Intelligence (AAAI'24)*. Vancouver, Canada. 2024.  
(acceptance rate: 24%)
- [20] Erhu He, **Yiqun Xie**, Alexander Sun, Jacob Zwart, Jie Yang, Zhenong Jin, Yang Wang, Hassan Karimi and Xiaowei Jia.  
Fair Graph Learning Using Constraint-aware Priority Adjustment and Graph Masking in River Networks.  
*Accepted by: The 38th AAAI Conference on Artificial Intelligence (AAAI'24)*. Vancouver, Canada. 2024.  
(acceptance rate: 24%)
- [21] Zelin Xu, Tingsong Xiao, Wenchong He, Yu Wang, Zhe Jiang, Shigang Chen, **Yiqun Xie**, Xiaowei Jia, Da Yan and Yang Zhou.  
Spatial-Logic-Aware Weakly Supervised Learning for Flood Mapping on Earth Imagery.  
*Accepted by: The 38th AAAI Conference on Artificial Intelligence (AAAI'24)*. Vancouver, Canada. 2024.  
(acceptance rate: 24%)
- [22] Mingzhi Hu, Xin Zhang, Yanhua Li, **Yiqun Xie**, Xiaowei Jia, Xun Zhou and Jun Luo.  
Only Attending What Matter within Trajectories – Memory-Efficient Trajectory Attention.  
*Accepted by: SIAM International Conference on Data Mining (SDM'24)*. 2024. (acceptance rate: 29%)
- [23] Erhu He, **Yiqun Xie**, Licheng Liu, Zhenong Jin, Dajun Zhang and Xiaowei Jia.  
Knowledge Guided Machine Learning for Extracting, Preserving, and Adapting Physics-aware Features.  
*Accepted by: SIAM International Conference on Data Mining (SDM'24)*. 2024. (acceptance rate: 29%)
- [24] Nasrin Kalanat, **Yiqun Xie**, Yanhua Li and Xiaowei Jia.  
Spatial-Temporal Augmented Adaptation via Cycle-Consistent Adversarial Network: An Application in Streamflow Prediction.  
*Accepted by: SIAM International Conference on Data Mining (SDM'24)*. 2024. (acceptance rate: 29%)
- [25] Zhihao Wang, **Yiqun Xie**, Xiaowei Jia, Lei Ma and George Hurtt.  
High-Fidelity Deep Approximation of Ecosystem Simulation over Long-Term at Large Scale.  
*ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL'23)*. Hamburg. 2023. (acceptance rate: 20.1%)
- [26] **Yiqun Xie\***, Zhaonan Wang\*, Gengchen Mai, Yanhua Li, Xiaowei Jia, Song Gao and Shaowen Wang.  
Geo-Foundation Models: Reality, Gaps and Opportunities (Vision Paper).  
*ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL'23)*. Hamburg. 2023.
- [27] Mingzhi Hu, Zhuoyun Zhong, Xin Zhang, Yanhua Li, **Yiqun Xie**, Xiaowei Jia, Xun Zhou, and Jun Luo.  
Self-supervised Pre-training for Robust and Generic Spatial-Temporal Representations.  
*Accepted by: IEEE International Conference on Data Mining*. Shanghai. 2023. (acceptance rate: 9.37%)
- [28] Shengyu Chen, Nasrin Kalanat, Simon Topp, Jeffrey Sadler, **Yiqun Xie**, Zhe Jiang and Xiaowei Jia.

- Meta-Transfer-Learning for Time Series Data with Extreme Events: An Application to Water Temperature Prediction.  
*Accepted by: 32nd ACM International Conference on Information and Knowledge Management.* Birmingham. 2023. (acceptance rate: 24%)
- [29] Dongyao Zhu, Bowen Lei, Jie Zhang, Yanbo Fang, **Yiqun Xie**, Ruqi Zhang and Dongkuan Xu.  
Rethinking Data Distillation: Do Not Overlook Calibration.  
*International Conference on Computer Vision (ICCV'23).* Paris. 2023.
- [30] Zhili Li, **Yiqun Xie** and Xiaowei Jia.  
Confidence-based Spatial Self-Corrective Learning to Expand Height Data in High Latitudes.  
*International Joint Conference on Artificial Intelligence (IJCAI'23).* Macao. 2023. (acceptance rate: ~20%)
- [31] Erhu He, Yue Wan, Ben Letcher, Jenn Fair, **Yiqun Xie** and Xiaowei Jia.  
CGS: Coupled Growth and Survival Model with Cohort Fairness.  
*International Joint Conference on Artificial Intelligence (IJCAI'23).* Macao. 2023. (acceptance rate: ~20%)
- [32] **Yiqun Xie**<sup>\*</sup>, Zhili Li<sup>\*</sup>, Han Bao, Xiaowei Jia, Dongkuan Xu, Xun Zhou and Sergii Skakun.  
Auto-CM: Unsupervised Deep Learning for Satellite Imagery Composition and Cloud Masking Using Spatio-Temporal Dynamics.  
*Thirty-Seventh AAAI Conference on Artificial Intelligence (AAAI'23).* Washington D.C., 2023. (acceptance rate: 19.6%)
- [33] Zhili Li, **Yiqun Xie**, Xiaowei Jia, Kara Stuart, Caroline Delaire and Sergii Skakun.  
Point-to-Region Co-Learning for Poverty Mapping at High Resolution Using Satellite Imagery.  
*Thirty-Seventh AAAI Conference on Artificial Intelligence (AAAI'23).* Washington D.C., 2023. (acceptance rate: 19.6%)
- [34] Erhu He<sup>\*</sup>, **Yiqun Xie**<sup>\*</sup>, Licheng Liu, Weiye Chen, Zhenong Jin and Xiaowei Jia.  
Physics Guided Neural Networks for Time-aware Fairness: An Application in Crop Yield Prediction.  
*Thirty-Seventh AAAI Conference on Artificial Intelligence (AAAI'23).* Washington D.C., 2023. (acceptance rate: 19.6%)
- [35] Zhexiong Liu, Licheng Liu, **Yiqun Xie**, Zhenong Jin and Xiaowei Jia.  
Task-Adaptive Meta-Learning Framework for Advancing Spatial Generalizability.  
*Thirty-Seventh AAAI Conference on Artificial Intelligence (AAAI'23).* Washington D.C., 2023. (acceptance rate: 19.6%)
- [36] Shengyu Chen, **Yiqun Xie**, Xiang Li, Xu Liang and Xiaowei Jia.  
Physics-Guided Meta-Learning Method in Baseflow Prediction over Large Regions.  
*SIAM International Conference on Data Mining (SDM'23).* 2023. (acceptance rate: 27.4%)  
**Best Application Paper Award (1/459)**
- [37] Xiaowei Jia, Shengyu Chen, Can Zheng, **Yiqun Xie**, Zhe Jiang, Nasrin Kalanat.  
Physics-guided Graph Diffusion Network for Combining Heterogeneous Simulated Data: An Application in Predicting Stream Water Temperature.  
*SIAM International Conference on Data Mining (SDM'23).* 2023. (acceptance rate: 27.4%)
- [38] Yan Li, Mingzhou Yang, Matthew Eagon, Majid Farhadloo, **Yiqun Xie**, William Northrop and Shashi Shekhar.  
Eco-PiNN: A Physics-informed Neural Network for Eco-toll Estimation..

- SIAM International Conference on Data Mining (SDM'23)*. 2023. (acceptance rate: 27.4%)
- [39] Zhe Jiang, Yupu Zhang, Saugat Adhikari, Da Yan, Arpan Man Sainju, Xiaowei Jia and **Yiqun Xie**. Hidden Markov Forest for Terrain-Aware Flood Inundation Mapping on Earth Imagery. *SIAM International Conference on Data Mining (SDM'23)*. 2023. (acceptance rate: 27.4%)
- [40] **Yiqun Xie\***, Erhu He\*, Xiaowei Jia, Weiye Chen, Han Bao, Sergii Skakun, Zhe Jiang, Rahul Ghosh and Praveen Ravirathinam. Fairness by “Where”: A Statistically-Robust and Model-Agnostic Bi-Level Learning Framework. *The Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI'22)*. Virtual online, 2022. (acceptance rate: 15%)
- [41] **Yiqun Xie\***, Erhu He\*, Xiaowei Jia, Han Bao, Xun Zhou, Rahul Ghosh and Praveen Ravirathinam. Statistically-Guided Deep Network Transformation to Harness Heterogeneity in Space (Extended Abstract). *The 31st International Joint Conference on Artificial Intelligence (IJCAI'22)*, Sister Conference Best Paper Track. 2022. (invitation only)
- [42] Han Bao, Xun Zhou, **Yiqun Xie**, Yanhua Li and Xiaowei Jia. STORM-GAN: Spatio-Temporal Meta-GAN for Cross-City Estimation of Human Mobility Responses to COVID-19. *IEEE International Conference on Data Mining (ICDM'22)*. 2022. (acceptance rate: 9.77%)
- [43] Wenchong He, Marcus Kriby, Zhe Jiang, **Yiqun Xie**, Xiaowei Jia, Da Yan and Yang Zhou. Quantifying and Reducing Registration Uncertainty of Spatial Vector Labels on Earth Imagery. *The 28th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD'22)*. 2022. (acceptance rate: 15%)
- [44] Erhu He\*, **Yiqun Xie\***, Xiaowei Jia, Weiye Chen, Han Bao, Xun Zhou, Zhe Jiang, Rahul Ghosh and Praveen Ravirathinam. Sailing in the Location-Based Fairness-Bias Sphere. *The 30th ACM SIGSPATIAL International Conference on Advancements in Geographic Information Systems (SIGSPATIAL'22)*. 2022. (acceptance rate: 23.8%)
- [45] Xiaowei Jia, Shengyu Chen, **Yiqun Xie**, Haoyu Yang, Alison Appling, Samantha Oliver and Zhe Jiang. Modeling Reservoir Release in Stream Temperature Prediction Using Pseudo-Pro prospective Learning and Physical Simulations. *SIAM International Conference on Data Mining (SDM'22)*. 2022. (acceptance rate: 27.8%)
- [46] Xiaohu Zhao, Kebin Jia, Benjamin Letcher, Jennifer Fair, **Yiqun Xie**, and Xiaowei Jia. VIMTS: Variational-based Imputation for Multi-modal Time Series. *IEEE International Conference on Big Data (BigData'22)*. 2022. (acceptance rate: 19.2%)
- [47] **Yiqun Xie\***, Erhu He\*, Xiaowei Jia, Han Bao, Xun Zhou, Rahul Ghosh and Praveen Ravirathinam. A Statistically-Guided Deep Network Transformation and Moderation Framework for Data with Spatial Heterogeneity. *IEEE International Conference on Data Mining (ICDM'21)*. 2021. (acceptance rate: 9.9%)  
**Best Paper Award (1/990)**
- [48] Xiaowei Jia, **Yiqun Xie**, Sheng Li, Shengyu Chen, Jacob Zwart, Jeffrey Sadler, Alison Appling, Samantha Oliver and Jordan Read. Physics-Guided Machine Learning from Simulation Data: An Application in Modeling Lake and River Systems.

- IEEE International Conference on Data Mining (ICDM'21)*. 2021. (acceptance rate: 9.9%)
- [49] **Yiqun Xie\***, Xiaowei Jia\*, Han Bao, Xun Zhou, Jia Yu, Rahul Ghosh and Praveen Ravirathinam. Spatial-Net: A Self-Adaptive and Model-Agnostic Deep Learning Framework for Spatially Heterogeneous Datasets. *Proceedings of the 29th ACM SIGSPATIAL International Conference on Advancements in Geographic Information Systems (SIGSPATIAL'21)*. 2021. (acceptance rate: 22.4%)
- [50] **Yiqun Xie**, Han Bao, Yan Li and Shashi Shekhar. Discovering Spatial Mixture Patterns of Interest. *Proceedings of the 28th ACM SIGSPATIAL International Conference on Advancements in Geographic Information Systems (SIGSPATIAL'20)*. 2020. (acceptance rate: 22.1%)
- [51] Han Bao, Xun Zhou, Yingxue Zhang, Yanhua Li and **Yiqun Xie**. COVID-GAN: Estimating Human Mobility Responses to COVID-19 Pandemic through Spatio-Temporal Conditional Generative Adversarial Networks. *Proceedings of the 28th ACM SIGSPATIAL International Conference on Advancements in Geographic Information Systems (SIGSPATIAL'20)*. 2020. (acceptance rate: 22.1%)
- [52] **Yiqun Xie**, Shashi Shekhar, Richard Feiock and Joseph Knight. Revolutionizing Tree Management via Intelligent Spatial Techniques. *Proceedings of the 27th ACM SIGSPATIAL International Conference on Advancements in Geographic Information Systems (SIGSPATIAL'19)*. Chicago, IL, Nov. 2019. (acceptance rate: 15% for vision papers). **Best Vision Paper Award**
- [53] **Yiqun Xie** and Shashi Shekhar. Significant DBSCAN towards Statistically Robust Clustering. *International Symposium on Spatial and Temporal Databases (SSTD'19)*. Vienna, Austria, Aug. 2019. (acceptance rate: 32%) **Best Paper Award**
- [54] **Yiqun Xie** and Shashi Shekhar. A Nondeterministic Normalization based Scan Statistic (NN-scan) towards Robust Hotspot Detection. *SIAM International Conference on Data Mining (SDM'19)*. Calgary, Canada, May 2019. (acceptance rate: 22.7%)
- [55] **Yiqun Xie**, Han Bao, Shashi Shekhar and Joseph Knight. TIMBER: A Framework for Mining Inventories of Individual Trees in Urban Environments using Remote Sensing Datasets. *IEEE International Conference on Data Mining (ICDM'18)*. Singapore, Nov. 2018. (acceptance rate: 19.94%)
- [56] **Yiqun Xie**, Rahul Bhojwani, Shashi Shekhar and Joseph Knight. An Unsupervised Augmentation Framework for Deep Learning based Geospatial Object Detection: A Summary of Results. *Proceedings of the 26th ACM SIGSPATIAL Conference on Advances in Geographic Information Systems (SIGSPATIAL'18)* Seattle, WA, Nov. 2018. (acceptance rate: 20%)
- [57] **Yiqun Xie**, Jayant Gupta, Yan Li and Shashi Shekhar. Transforming Smart Cities with Spatial Computing. *IEEE International Smart Cities Conference (ISC2'18)*. Kansas City, MO, Sep. 2018. (invited)
- [58] **Yiqun Xie** and Shashi Shekhar.

FF-SA: Fragmentation-Free Spatial Allocation.

*International Symposium on Spatial and Temporal Databases (SSTD'17)*. Arlington, VA, Aug. 2017. (acceptance rate: 32.8%)

- [59] S. K. Prasad, D. Aghajarian, Mi. McDermott, D. Shah, M. Mokbel, S. Puri, S. J. Rey, S. Shekhar, **Y. Xie**, R. R. Vatsavai, F. Wang, Y. Liang, H. Vo and S. Wang. In: Parallel Processing over Spatial-Temporal Datasets from Geo, Bio, Climate and Social Science Communities: A Research Roadmap. *IEEE Big Data Congress*. June 2017, Honolulu, HI.
- [60] E. Eftelioglu, S. Shekhar, D. Oliver, X. Zhou, M. Evans, **Y. Xie**, J. Kang, R. Laubscher and C. Farah. Ring-shaped hotspot detection: a summary of results. *IEEE International Conference on Data Mining (ICDM'14)*. Shenzhen, China, Dec. 2014. (acceptance rate: 19.5%)

## Workshops

- [61] Yan Li, Majid Farhadloo, Santhoshi Krishnan, **Yiqun Xie**, Timothy L Frankel, Shashi Shekhar and Arvind Rao. CSCD: Towards Spatially Resolving the Heterogeneous Landscape of MxIF Oncology Data. *10th ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data (BigSpatial'22)* (Best Paper Award)
- [62] Jayant Gupta, **Yiqun Xie** and Shashi Shekhar. Towards Spatial Variability Aware Deep Neural Networks (SVANN): A Summary of Results. *1st ACM SIGKDD Workshop on Deep Learning for Spatiotemporal Data, Applications, and Systems (DeepSpatial)*. Aug. 2020. (Best Paper Award)
- [63] Yan Li, **Yiqun Xie**, Pengyue Wang, Shashi Shekhar and William Northrop. Significant Lagrangian Linear Hotspot Discovery. *13th ACM SIGSPATIAL International Workshop on Computational Transportation Science (IWCTS)*. Nov. 2020.
- [64] **Yiqun Xie**, KwangSoo Yang, Shashi Shekhar, Brent Dalzell, David Mulla. Spatially-constrained Geodesign Optimization for Improving Agricultural Watershed Sustainability. *AAAI'17 Workshop on AI and OR for Social Good*. 2017.

## Non-Computing Conferences/Workshops

- [65] Ramanath, Anushree, Saipreethi Muthusrinivasan, **Yiqun Xie**, Shashi Shekhar, and Bharathkumar Ramachandra. NDVI versus CNN features in deep learning for land cover classification of aerial images. *IEEE International Geoscience and Remote Sensing Symposium (IGARSS'19)*. 2019.

## Reports

- [66] Weiye Chen\*, Zhihao Wang\*, Zhili Li\*, **Yiqun Xie**, Xiaowei Jia, Anlin Li. Deep Semantic Segmentation for Building Detection Using Knowledge-Informed Features from Li-DAR Point Clouds.



ACM SIGSPATIAL 2022. Seattle, WA. (invited as a top-3 SIGSPATIAL Cup solution)

- [67] Naoki Abe, **Yiqun Xie**, Shashi Shekhar, Chid Apte, Vipin Kumar, Mitch Tuinstra, and Ranga Raju Vatsavai.  
Data Science for Food, Energy and Water: A Workshop Report.  
*SIGKDD Explorations*. 2017.
- [68] **Yiqun Xie**, Majid Farhadloo, Ning Guo, Shashi Shekhar, Eric Watkins, Len Kne, Han Bao, Aaron J. Patton, and Kevin Morris.  
NTEP-DB 1.0: A relational database for the national turfgrass evaluation program.  
*International Turfgrass Society Research Journal*. 2021.
- [69] Jia Yu and **Yiqun Xie**.  
Front matter. Proceedings of the 3rd ACM SIGSPATIAL International Workshop on APIs and Libraries for Geospatial Data Science.  
ACM, New York, NY, USA.

## Book Chapters

- [70] **Yiqun Xie**, Xiaowei Jia, Weiye Chen, Erhu He.  
Heterogeneity-Aware Deep Learning in Space: Performance and Fairness.  
*Chapter in: Handbook of Geospatial Artificial Intelligence (1st Ed.)*. Eds.: Gao, S., Hu, Y., & Li, W. CRC Press. 2023.
- [71] Yan Li, **Yiqun Xie** and Shashi Shekhar.  
Spatial Data Science.  
*Chapter in: Machine Learning for Data Science Handbook*. Eds.: Rokach, L., Maimon, O., Shmueli, E. Springer, Cham.
- [72] Bryan C. Runck, Carissa Slotterback, David Pitt, Len Kne, David Mulla, Nicholas Jordan, Marcus Grubbs, Madeline Goldkamp, Alexander Heid, Peter Wiringa and **Yiqun Xie**.  
Designing and Deploying Collaborative Models for Multifunctional Landscape Design: Geodesign in Practice.  
*Chapter in: Innovations in Collaborative Modeling*. MSU Press.

## TALKS/PRESENTATIONS/POSTERS

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\*This section does not include presentations for conference/workshop papers.

- Yiqun Xie. Fast Approximation of Ecosystem Projection with Deep Learning. Invited Innovation Session panel talk at 2023 American Geophysical Union (AGU) Fall Meeting. San Francisco, CA. December, 2023.
- Yiqun Xie. AI-powered Ecosystem Simulation. Department Open Research Day, University of Maryland. December, 2023.
- Yiqun Xie. Harnessing AI Challenges for Earth Science Problems: From Space to Physics. Invited talk at iHARP: NSF HDR Institute for Harnessing Data and Model Revolution in the Polar Regions. University of Maryland Baltimore County, October 2023.
- Yiqun Xie. AI for Geospatial Problems: Gaps, Risks & Opportunities. National Geospatial Advisory Committee (NGAC) meeting. Washington D.C., US, May 2023.

- Yiqun Xie. Opportunities & Risks of GeoAI for Digital Resilience: A Technical Perspective. Invited Panel Talk at the National Academies' of Science, Engineering and Medicine, Meeting on GeoAI and the Future of Mapping: Implications for 21st-Century Digital Resilience, Washington D.C., US, May 2023.
- Yiqun Xie. Heterogeneity-Aware Learning in Space: Performance and Fairness. Keynote Talk at the ACM SIGSPATIAL International Workshop on Advances in Resilient and Intelligent Cities (ARIC 2022), Seattle, WA, US, Nov. 2022.
- Yiqun Xie. Harnessing Distribution Shift: When Machine Learning Meets Spatial Big Data. Keynote Talk at Seoul Big Data Forum, Seoul, South Korea. Nov. 2022.
- Yiqun Xie. Heterogeneity-Aware Learning in Space: Performance and Fairness. Seminar Talk at the Department of Computer Science, University of Maryland. Oct. 21, 2022.
- Yiqun Xie, Weiye Chen, Xiaowei Jia and Erhu He. Fairness-Aware Machine Learning in Space: Tackling Bias Related to Locations. Social Data Science (SoDa) Center Workshop, University of Maryland. Sep. 21, 2022.
- Yiqun Xie and Kara Stuart. Leave No One Behind: Spatial AI Enabled Settlement Mapping to Enhance WASH Access for Vulnerable Populations. Google AI for Social Good Mid-Program Workshop. Feb. 2022.
- Jia Yu, Yiqun Xie, Kyle A. Duncan and Sinead Louise Farrell. Apache Sedona in Action: Analyzing Large-scale Arctic Observations Using an Open-source Big Data Platform. AGU Fall Meeting 2021. New Orleans, LA. Dec. 2021.
- Yiqun Xie and Xiaowei Jia. Spatial-Net: A Statistically-Guided and Model-Agnostic Deep Learning Framework for Earth Observation with Spatially Heterogeneous Datasets. UMD/NASA Workshop on AI and Machine Learning in Earth Sciences. University of Maryland. Sep. 2021.
- Xiaowei Jia, Yiqun Xie, Sheng Li, Shengyu Chen, Jacob Zwart, Jeffrey Sadler, Alison Appling, Samantha Oliver and Jordan Read. Physics-Guided Machine Learning from Simulation Data: An Application in Modeling Lake and River Systems. UMD/NASA Workshop on AI and Machine Learning in Earth Sciences. University of Maryland. Sep. 2021.
- Yiqun Xie. Spatial Data Science: Challenges and New Techniques. Departmental Seminar. University of Maryland, College Park. Nov. 12, 2020.
- Yiqun Xie, Shashi Shekhar, Richard Feiock and Joseph Knight. Intelligent Spatial Technologies for Urban Tree Mapping. USDA-NIFA Next Generation Land-Use Change Methodology Project Workshop 2: Machine learning and data fusion for aerial imagery interpretation of land use change. Virtual via Zoom. June 10-11, 2020.
- Yiqun Xie and Shashi Shekhar. Spatial Computing. Inaugural meeting of the Center for Excellence in Remote Sensing (CERS), University of Minnesota, May 16, 2018.
- Yiqun Xie, Shashi Shekhar, Brent Dalzell, David Mulla. Fragmentation-Free Land Allocation: A Spatial Optimization Approach. Machine Learning: From Farm to Table Workshop, Midwest Big Data Hub, University of Illinois at Urbana-Champaign, Apr. 2017.
- Yiqun Xie. On the road with collaborative Geodesign. ESRI Developer Summit, Palm Springs, CA, Mar. 2014.

## TEACHING

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• Instructor at University of Maryland

Spring 2024

<i>Introduction to Spatial Artificial Intelligence</i>	
• Instructor at University of Maryland <i>Introduction to Spatial Artificial Intelligence</i>	Spring 2023
• Instructor at University of Maryland <i>Spatial Data Mining</i>	Fall 2022
• Instructor at University of Maryland <i>Deep Learning for Spatial and Spatio-Temporal Data</i>	Spring 2022
• Instructor at University of Maryland <i>Introduction to Spatial Artificial Intelligence</i>	Spring 2022
• Instructor at University of Maryland <i>Spatial Data Mining</i>	Fall 2021
• Instructor at University of Maryland <i>Introduction to Spatial Artificial Intelligence</i>	Spring 2021
• Guest Lecture & Teaching Assistant at University of Minnesota <i>Spatial Data Science Research</i>	Spring 2018
• Guest Lecture & Teaching Assistant at University of Minnesota <i>Introduction to Machine Learning</i>	Spring 2017
• Guest Lecture & Teaching Assistant at University of Minnesota <i>Machine Learning</i>	Fall 2016
• Guest Lecture & Teaching Assistant at University of Minnesota <i>Database Management Systems</i>	Spring 2016
• Guest Lecture & Teaching Assistant at University of Minnesota <i>From Virtual Globe and Google Maps to Spatial Computing</i>	Fall 2015

## STUDENTS

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- Weiye Chen, PhD student, 2021 – current
- Zhili Li, PhD student, 2022 (Spring) – current
- Zhihao Wang, PhD student, 2022 - current
- Ruichen Wang, PhD student, 2023 - current
- Kangyang Chai, PhD student, 2023 - current
- Xiaoyue Tian, MS student, 2022 - 2023
- Anh Nhu, BS student, 2022 - current
- Leo Du, BS student, 2023 - current
- Evan Khym, High School intern, 2023
- Aditya Lahiri, High School intern, 2023
- Aditya Mogul, High School intern, 2023
- Emma Zou, High School intern, 2023
- William Lu, High School intern, 2023-2024

## SERVICES

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### Co-Chair

- ACM SIGSPATIAL Workshop on Spatial Big Data and AI for Industrial Apps. (GeoIndustry), 2023, 2022
- ACM SIGSPATIAL Workshop on APIs and Libraries for Spatial Data Sci. (SpatialAPI), 2022, 2021.

### Session Chair

- SIAM International Conference on Data Mining, 2023
- AAAI Conference on Artificial Intelligence, 2023
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining, 2022
- The 13th International Workshop on Spatial and Spatiotemporal Data Mining (SSTDM-18), IEEE International Conference on Data Mining 2018 (ICDM'18)

### Senior Program Committee

- SIAM International Conference on Data Mining (SDM): 2024, 2023
- Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD), 2024

### Technical Program Committee (Conferences)

- AAAI Conference on Artificial Intelligence: 2024, 2023, 2022
- International Joint Conferences on Artificial Intelligence (IJCAI): 2024, 2023, 2022, 2021
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining: 2022, 2021
- SIAM International Conference on Data Mining: 2022
- ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems: 2023, 2022, 2021, 2020

### Technical Program Committee (Workshops)

- ACM SIGKDD DeepSpatial 2022, 2021
- ACM SIGSPATIAL GeoAI 2021
- ACM SIGSPATIAL SpatialEpi 2023, 2021, 2020 (formerly named COVID)
- ACM SIGKDD UrbComp 2020
- ACM SIGKDD FEED 2020

### Journal/Special Issue Editors

- Guest Editor: International Journal of Geographical Information Science, Special Issue on “GeoHealth Data Science for Geographic Knowledge Discovery, Prediction and Transfer in Health Research”
- Guest Editor: International Journal of Applied Earth Observation and Geoinformation, Special Issue on “Spatially Explicit ML&AI”
- Guest Editor: Remote Sensing, Special Issue on “Advancing Machine Learning for Remote Sensing to Enhance Spatio-Temporal Generalizability”

### Journal Reviewers

- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- ACM Transactions on Intelligent Systems and Technology (TIST)
- ACM Transactions on Knowledge Discovery from Data (TKDD)
- ACM/IMS Transactions on Data Science
- Artificial Intelligence In Medicine
- ACM Transactions on Spatial Algorithms and Systems (TSAS)
- Geoinformatica
- Neurocomputing
- Remote Sensing of Environment
- International Journal of Geographical Information Science
- Transactions in GIS
- International Journal of Applied Earth Observation and Geoinformation
- ISPRS International Journal of Geo-Information
- Frontiers in Big Data
- New Generation Computing
- Remote Sensing
- Scientific Reports

### **Grant Proposal Reviewing**

- National Science Foundation (NSF)
- NASA
- NSERC (Canada)

### **University Services**

- Department merit review committee, 2023
- Department advisory committee, 2022-now
- Department graduate committee, 2021-2022
- Organizer, GIS Day Lightning Talk Session, CGIS, 2020
- Proposal/Thesis Committee: Yunting Song, Guimin Zhu, Ruohan Li, Yiming Zhang, Songhua Hu (Civil Eng.)
- PAC: Weiye Chen (Chair), Zhili Li (Chair), Peiqi Zhang, Yuehui Qian, Abdul Qadir, Yingrui Zhao, Liu Zhen, Caraballo V. Jordan