

# Junjun Yin, Ph.D

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## Contact Information

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## Current Position

*Assistant Research Professor*  
Social Science Research Institute

*ICS Associate*  
Institute for CyberScience  
The Pennsylvania State University, University Park, PA, USA

## Previous Position

*Postdoctoral Research Fellow*  
CyberGIS Center for Advanced Digital and Spatial Studies  
Department of Geography and Geographic Information Science  
National Center for Supercomputing Applications (NCSA)  
University of Illinois at Urbana-Champaign, IL, USA

## Research Interests

GIScience; Spatial Analysis and Modeling; Computational Geography; Urban Complexity and Human Mobility; (Geo)Visual-Analytics and Data Mining; GeoSpatial Big Data; GeoComputing; Spatial Interaction; High-performance (cyberGIS), Web and Mobile GIS

## Education

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| 2009 - 2013 | <i>Ph.D</i> in Spatial Information Science, Dublin Institute of Technology, Ireland<br><i>Advisors:</i> Dr. James D. Carswell (Dublin Institute of Technology), Dr. Michela Bertolotto (University College Dublin) |
| 2006 - 2009 | <i>MSc</i> in Geomatics, University of Gävle, Sweden<br><i>Advisor:</i> Dr. Bin Jiang (University of Gävle)  |
| 2002 - 2006 | <i>BSc</i> in Electronic Engineering, University of Electronic Science and Technology of China   |

## Academic Experience

2016-present	Social Science Big Data Research Scientist, Pennsylvania State University, USA
2016	Lecturer, Department of Geography and Geographic Information Science; University of Illinois at Urbana-Champaign, USA
2014-2016	Postdoctoral Research Associate, CyberGIS Center for Advanced Digital and Spatial Studies; National Center for Supercomputing Applications; University of Illinois at Urbana-Champaign, USA
2013-2014	Senior Demonstrator, Dublin Institute of Technology, Ireland
2007-2008	Research Assistant, Hong Kong Polytechnic University, Hong Kong SAR, China

## Research Grants and Projects

**Co-PI.** “RR: The Generalizability and Replicability of Twitter Data for Population Research”. National Science Foundation SOC grant, lead PI: Prof. Guangqing Chi, \$500,000. Project dates: 07/15/2018–06/30-2021

**PI.** “Data Science: Mining sequential mobility patterns from semantic Twitter user trajectories”. Microsoft Azure Data Science Research Award, \$10,000. Project dates: 05/01/2018–04/30/2019

**Co-PI.** “An Innovative Approach to Tackle the Opioid Epidemic: Utilizing Twitter Data and Integrating Big Data Analytics and Spatial and Social Network Analyses”. Social Science Research Institute Level 2 Research Award, lead PI: Prof. Zhen Lei, \$20,000. Project dates: 09/01/2018–08/30-2020

**Co-I.** “Cognitive Changes Associated with Hormonal Treatment for Breast Cancer”. Health & Environment initiative seed grant award, lead I: Prof. Sheri A. Berenbaum, \$49,972. Project dates: 07/01/2017–06/30-2019

**Co-PI.** “The Generalizability and Replicability of Twitter Data for Population Research”. ICS seed grant award, lead PI: Prof. Guangqing Chi, \$35,000. Project dates: 07/01/2018–06/30-2019

**Co-PI.** “Ecological Migration in a Large-Scale Quasi-Experiment Design in China: Implications of Climate Change, Landscape Structure, Ecosystem Services and Government Intervention”. IEEE seed grant award, lead PI: Prof. Guangqing Chi, \$25,000. Project dates: 04/15/2017–06/30-2018

**PI.** “Mining Twitter User Demographics as a First-Step in Big Data for Population Research”. XSEDE (Extreme Science and Engineering Discovery Environment) Startup computational resource allocation award, 50,000 SUs & 40 TB storage (estimated \$2,794.78). Project dates: 03/27/2017–09/26-2018

**PI.** “A cloud computing enabled GIS platform for the integration and synthesis of multi-layer geospatial data sources in urban studies: Understanding urban dynamics from geospatial Big Data”. Microsoft Azure Data Science Research Award, \$20,000. Project dates: 12/04/2016–12/03/2017

**SP/Research Scientist.** “Activity space contexts and measuring environmental exposure in behavioral research”. R21 NCI grant (ASCMEE Study), lead PI: Prof. Stephen Matthews.

## Publications

### PEER REVIEWED JOURNALS

- 2018 Gao, Y., Wang, S. Padmanabhan, A., **Yin, J.** and Cao, G. (2018). Mapping Spatiotemporal Patterns of Events Using Social Media: A Case Study of Influenza Trends. *International Journal of Geographical Information Science*, 32(3), pp. 425-449
- 2017 **Yin, J.**, Soliman, A., Yin, D. and Wang, S. (2017). Delineate Urban Boundaries in Great Britain from the Network of Large Scale Twitter User Spatial Interactions. *International Journal of Geographical Information Science*, 31(7), pp. 1293-1313
- 2017 Soliman, A., Soltani, Q., **Yin, J.**, Padmanabhan, A., and Wang, S (2017). Social sensing of urban land use based on analysis of Twitter users' mobility patterns. *PLoS ONE*, 12(7): e0181657. DOI:10.1371/journal.pone.0181657
- 2017 Zheng, K., Kwan, M.P., Fang, L., **Yin, J.**, Gu, D. and Fu, Y. (2017). A Topology-concerned Spatial Vector Data Model for Column-oriented Databases. *International Journal of Database Theory and Application*, 10(5), pp. 33-46
- 2016 **Yin, J.**, Gao, Y., Du, Z. and Wang, S. (2016). Exploring Multi-Scale Spatiotemporal Twitter User Mobility Patterns with a Visual-Analytics Approach. *ISPRS International Journal of Geo-Information*, 5(10):187.
- 2016 Jiang, B., Ma, D., **Yin, J.** and Sandberg, M. (2016). Spatial Distribution of Tweet Numbers and Densities in Cities. *Geographical Analysis*, 48(3), pp. 337-351
- 2015 Jiang, B., **Yin, J.** and Liu, Q. (2015). Zipf's Law for All the Natural Cities around the World. *International Journal of Geographical Information Science*, 29(3), pp. 498-522
- 2014 Jiang, B. and **Yin, J.** (2014). Ht-Index to Quantify the Fractal or Scaling Structure of Geographic Features. *Annals of the Association of American Geographers*, 104(3), pp. 530-540
- 2013 **Yin, J.** and Carswell, J.D. (2013). Spatial Search Techniques for Mobile 3D Queries in Sensor Web Environments. *ISPRS International Journal of Geo-Information*, 2(1): pp.135-154
- 2010 Carswell, J. D., **Yin, J.** and Gardiner, K. (2010). 3DQ: Threat Dome Visibility Querying on Mobile Devices *GIM International*, 24(8)
- 2010 Carswell, J.D., Gardiner, K. and **Yin, J.** (2010). Mobile Visibility Querying for LBS. *Transactions in GIS*, 14(6): pp. 791-809, Wiley online library
- 2009 Jiang, B., **Yin, J.** and Zhao, S. (2009). Characterizing the human mobility pattern in a large street network. *Physical Review E*, 80(2), 021136
- 2008 Jiang, B., Zhao, S. and **Yin, J.** (2008). Self-organized natural roads for predicting traffic flow: a sensitivity study. *Journal of statistical mechanics: Theory and experiment*, P07008, IOP Publishing

### PEER REVIEWED CONFERENCES AND LECTURE NOTES

- 2018 **Yin, J.**, Chi, G. and Van Hook, J. (2018). Evaluating the Representativeness in the Geographic Distribution of Twitter User Population. *The 12th Workshop on Geographic Information Retrieval in ACM SIGSPATIAL 2018*, November 6-9, 2018, Seattle, Washington, USA
- 2018 Jeong, M., **Yin, J.**, and Wang, S. (2018). Outliers Detection and Comparison of Origin-Destination Flows with Data Depth. *The 10th International Conference on Geographic Information Science (GIScience 2018)*, August 28-31, 2018, Melbourne, Australia
- 2017 **Yin, J.** (2017). Mining sequential mobility pattern from semantics enriched Twitter user

- trajectories. *NSF Mobility Workshop on Analyzing Movement and Mobility within Geographic Context*, May 11-12, 2017, The Ohio State University, Columbus, Ohio
- 2017 Chi, G., **Yin, J.** and Hook, J.V. (2017). Predicting Twitter User Demographics as a First Step in Big Data for Population Research. *The 28th International Population Conference of the International Union for the Scientific Study of Population*, October 29-November 4, 2017, Cape Town, South Africa
- 2016 **Yin, J.**, Lu, B., Yin, D. and Wang, S. (2016). A scalable visual-analytics approach for studying mobility networks: Revealing hierarchical structures in taxi mobility flows of New York, *The Third International Conference on CyberGIS and Geospatial Data Science*, July 26-28, 2016, Urbana, Illinois
- 2016 **Yin, J.**, Gao, Y. and Wang, S. (2016). Urban Sensing from Volunteered Citizen Participation using Mobile Devices. In *Seeing Cities through Big Data: Research, Methods and Applications in Urban Informatics*, Springer
- 2015 Soliman, A., **Yin, J.**, Soltani, K., Padmanabhan, A., and Wang, S. (2015). Where Chicagoans tweet the most: Semantic analysis of preferential return locations of Twitter users, *1st International Workshop on Smart Cities and Urban Analytics 2015, 23rd ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*
- 2014 **Yin, J.** and Wang, S. (2014). Understanding the Evolvments of Natural Cities from Night-time Light Images: A CyberGIS-Enhanced Approach to Large Scale Geospatial Data Analysis, *The Second International Conference on CyberGIS and Geodesign*, August 19-21, 2014, Redlands, California
- 2014 **Yin, J.**, Gao, Y. and Wang, S. (2014). CyberGIS Enabled Urban Sensing from Volunteered Citizen Participation using Mobile Devices. *NSF Workshop on Big Data and Urban Informatics 2014*
- 2013 Truong-Hong, L., Thi, T.T.P, **Yin, J.** and Carswell, J.D. (2013). Detailed 3D building models for Google Earth integration. In *Proceedings of the 13th International Conference on Computational Science and Its Applications (ICCSA 2013)*, Ho Chi Minh City, Vietnam: Springer (**\*Best paper award**)
- 2013 Thi, T.T.P, Truong-Hong, L., **Yin, J.** and Carswell, J.D. (2013). Exploring Spatial Business Data: A ROA based eCampus application. In *Proceedings of the 11th International conference on Web and Wireless Geographical Information Systems*, Banff, AB: Springer Berlin Heidelberg, pp. 164-179
- 2012 **Yin, J.** and Carswell, J.D. (2012). Effects of Variations in 3D Spatial Search Techniques on Mobile Query Speed vs Accuracy. *Web and Wireless Geographical Information Systems*, Naples, Italy. (**\*Best paper award**)
- 2012 Carswell, J.D. and **Yin, J.** (2012). Mobile Spatial Interaction in the Future Internet of Things. In *Proceedings of the 20th International Conference on Geoinformatics (GEOINFORMATICS)*, 2012, pp. 1-6
- 2012 **Yin, J.** and Carswell, J.D. (2012). MobiSpatial: Open-source for Mobile Spatial Interaction. *Proceedings of the 27th Annual ACM Symposium on Applied Computing*, pp. 572-573
- 2012 **Yin, J.** and Carswell, J.D. (2011). Touch2Query enabled mobile devices: A case study using OpenStreetMap and iPhone. *Web and Wireless Geographical Information Systems*, pp. 203-218, Springer
- 2009 Gardiner, K., **Yin, J.** and Carswell, J.D. (2009). EgoViz: A mobile based spatial interaction system. *Web and Wireless Geographical Information Systems*, pp. 135-152, Springer

## BOOKS

- 2009     **Yin, J.** (2009), *The Topological Patterns of Urban Street Networks: Exploring the topological patterns of urban street networks from analytical and visual perspectives*, VDM: Germany, ISBN: 3639161734

## INVITED TALKS

- 2018     Yin, J. (2018). Computational Geography for Capturing Geo-Complexity in Urban Studies. June, 2018, Newcastle University, Newcastle upon Tyne, UK
- 2018     Yin, J. (2018). Advanced Methods and Techniques for Big GeoData. June, 2018, ITC, University of Twente, Enschede, the Netherlands
- 2018     Yin, J. (2018). Geo-Complexity and Human mobility: Through the lens of spatial Big Data to understand urban dynamics. February, 2018, University of Denver, Denver, USA
- 2018     Yin, J. (2018). High-performance Computing with Hadoop. Software in the Humanities and Social Sciences Workshop. February, 2018, Penn State, University Park, USA

## PRESENTATIONS

- 2018     Yin, J. (2018). Spatial Interaction Patterns of Preferential Return Behaviors in People's Daily Life. The Association of American Geographers Annual Meeting, April 10-14, 2018, New Orleans, Louisiana, USA
- 2017     Yin, J. (2017). A mobility network approach to modeling urban spatial interactions: Insights from the movement Big Data in New York City. The Association of American Geographers Annual Meeting, April 5-9, 2016, Boston, Massachusetts, USA
- 2016     Yin, J. and Wang, S. (2016). Mining Mobility Patterns From Semantic Twitter User Trajectories. The Association of American Geographers Annual Meeting, March 29-April 2, 2016, San Francisco, California, USA
- 2015     Yin, J. and Wang, S. (2015). Finding community structures of UK cities based on large-scale Twitter user mobility patterns, *Association of American Geographers Annual Meeting, Chicago, 2015*, April 21-25, 2015, Chicago, Illinois, USA
- 2011     Yin, J. (2011), Web-service based Mobile Geospatial Application Development using Python, *PyCon 2011*, Dublin, Oct 8-9

## Teaching Experience as Instructor

- 2016 -     GEOG 479: Advanced Topics in GIS – CyberGIS, Spring, 2016, *Lecturer*, Department of Geography and Geographic Information Science, UIUC
- 2015 -     Parallel Databases, *workshop/short course series*, CyberGIS Center, UIUC
- 2015 -     Interactive Visualization of Large-scale Movement Data using Apache Spark, *Summer school series*, CyberGIS Center, UIUC
- 2015 -     Introducing the CyberGIS Toolkit in high performance computing environment, *workshop/short course series*, CyberGIS Center, UIUC
- 2015 -     Taming with geospatial Big Data with Hadoop, *workshop/short course series*, CyberGIS Center, UIUC
- 2014 -     Getting to know CyberGIS, *workshop/short course series*, CyberGIS Center, UIUC

2014 - 2016	Education and outreach at the CyberGIS Commons, <i>Lead</i> , University of Illinois at Urbana-Champaign, 2014 - 2016
2013	Programming in C, <i>assistant lecturer</i> , Dublin Institute of Technology, 2013 - 2014
2013	Object oriented programming for game development, <i>senior demonstrator/assistant lecturer</i> , Dublin Institute of Technology, 2013 - 2014
2013	User interface design and GUI programming with Java, <i>senior demonstrator/assistant lecturer</i> , Dublin Institute of Technology, 2013 - 2014

## Skills

Programming languages: Java, Python, Objective-C, Matlab, R, JavaScript, NoSQL  
 High performance computing: Apache Hadoop, Apache Spark, MongoDB  
 Mobile and Web development: iOS and Android, Cesium 3D Globe, D3.js  
 Spatial databases: PostGIS, Oracle Spatial, SpatiaLite, ArcGIS

## Honors and Awards

2013	<i>Fiosraigh Head of School Research Award</i> : for excellence in research, Dublin Institute of Technology
2013	<i>EU Future Internet Award</i> : for excellence in Future Internet research
2009	<i>PhD scholarship from Science Foundation Ireland (SFI)</i> : StratAG PhD scholarship
2006	<i>Outstanding Graduate Student Award</i> : University of Electronic Science and Technology of China
2006	<i>Best Undergraduate Dissertation Award</i> : Department of Electronic Engineering, University of Electronic Science and Technology of China
2005	<i>National Undergraduate Electronic Design Contest: Second prize</i> : Embedded system for Multi-channel and frequency wave generating, (Team: Junjun Yin, Yu Chen, and Xia Yu)

## Service to the Profession

### GUEST EDITORS

Guest editor for Special Issue of “Chinese Sociological Dialogue”: Spatiotemporal Big Data and Sustainable Social Development (2017)

### PROGRAM COMMITTEES AND ORGANIZERS

- **PC** member for W2GIS 2019: 17th International Symposium on Web and Wireless Geographical Information Systems, May 16-17, 2019, Kyoto, Japan
- **PC** member for International Conference on Location-based Social Media Data, March 5-7, 2015, Athens, Georgia, USA
- **Co-chair** for Advances in Spatial Interaction Models and Methods in the Big Data Era I, Spatiotemporal Symposium, 2018 AAG Annual Meeting, New Orleans, April 10 – April 14, 2018

- **Chair** for Big Movement Data for Geospatial Analytics on Urban Interactions, Symposium on Human Dynamics in Smart and Connected Communities, 2017 AAG Annual Meeting, Boston, Massachusetts, April 5 - April 9, 2017
- **Chair** for Understanding Urban Dynamics Based on Movement Big Data, 2016 AAG Annual Meeting, San Francisco, California, March 29 - April 2, 2016

#### REVIEWER FOR JOURNALS

Has reviewed for **21** journals

- *Annals of the American Association of Geographers* (2018)
- *International Journal of Geographical Information Science (IJGIS)* (2010, 2014-2018)
- *Journal of Geovisualization and Spatial Analysis* (2018)
- *Cartography and Geographic Information Science* (2018)
- *Computers, Environment and Urban Systems (CEUS)* (2009-2010, 2013-2017)
- *EPJ Data Science* (2017)
- *Geomatica* (2018)
- *GeoJournal* (2018)
- *Chinese Sociological Dialogue* (2018)
- *Spatial Information Research* (2018)
- *Sensors* (2018)
- *Geographical Analysis* (2016-2018)
- *Cluster Computing* (2017)
- *Journal of Geographical Systems* (2016-2017)
- *Demography* (2016-2018)
- *Environment and Planning B: Planning and Design* (2016-2017)
- *Science China Information Science* (2015)
- *PLOS One* (2013, 2015, 2017)
- *Cities* (2014)
- *ISPRS International Journal of Geo-Information* (2013-2015)
- *Journal of Location Based Services* (2013)

#### REVIEWER FOR CONFERENCES

- *GIScience* (2014, 2016)
- *UbiComp* (2016)

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