## **CURRICULUM VITAE**

# Yang Xu

(Last updated July 2021)

Department of Land Surveying and Geo-Informatics The Hong Kong Polytechnic University Hung Hom, Kowloon, Hong Kong

#### **EDUCATION**

Ph.D. Geography, The University of Tennessee, Knoxville, TN, USA, 2015

Dissertation: Mobility and Activity Space: Understanding Human Dynamics From Mobile Phone Location

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Data

M.S. Geographic Information Science, Wuhan University, Wuhan, China, 2011

B.S. Remote Sensing and Photogrammetry, Wuhan University, Wuhan, China, 2009

#### RESEARCH INTERESTS

Urban Informatics, Geographic Information Science (GIScience), GIS for Transportation, Spatiotemporal Data Mining, Human Mobility

## **PROFESSIONAL POSITIONS**

2017 - Present	Assistant Professor, Department of Land Surveying and Geo-Informatics, The Hong Kong
	Polytechnic University
2016 - 2017	Joint Postdoctoral Associate, MIT SENSEable City Laboratory, Cambridge, MA, USA
	Singapore-MIT Alliance for Research and Technology (SMART), Singapore.
2013 - 2015	Research Intern/Assistant, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN, USA

#### RESEARCH

## A. Grants and Contracts

2020 - 2021	Algorithm Development of Jeju Travel Recommendation System, Jeju Tourism Organization (PI, HK\$ 110,000)
2019 - 2022	Coupling Mobile Phone and Socioeconomic Datasets: A New Approach to Quantifying Dynamic Social Segregation in A Hybrid Physical-Virtual Space, Research Grant Council (RGC) of Hong Kong, Early Career Scheme (PI, HK\$ 886,800).
2019 - 2021	Integrating Spatiotemporal Features for Travel Demand Analysis and Forecast of Dockless Bike-Sharing in Urban Areas (时空特征融合的城市共享单车出行规律理解与需求预测方法研究), National Natural Science Foundation of China (PI, RMB 251,700).

- 2019 2020 Big Data Analysis on Travel Patterns of Visitors to Jeju, *Jeju Tourism Organization* (Consultancy Project).
- 2019 Travel Pattern Analysis of Foreign Visitors Using Mobile Communication Big Data, *Korea Tourism Organization* (Consultancy Project).
- 2019 2020 Uncover Space-Time Dynamics of Tourist Mobility Patterns from Large-Scale Mobile Positioning Data, *PolyU Hospitality and Tourism Research Centre*, (Co-I, HK\$ 241,800).
- 2018 2021 Big Data as A Testbed for Urban Theories, Start-up Fund of Hong Kong Polytechnic University (PI, HK\$ 800,000).

## B. Refereed Journal Articles

- **Xu, Y.,** Santi, P. and Ratti, C. Beyond Distance Decay: Discover Homophily in Spatially Embedded Social Networks. *Annals of the American Association of Geographers* (in press).
- Li, Xi., Xu, Y., Chen, Q., Wang, L., Zhang, X. and Shi, W. Short-Term Forecast of Bicycle Usage in Bike Sharing Systems: A Spatial-Temporal Memory Network. *IEEE Transactions on Intelligent Transportation Systems* (in press).
- Yang, X., Fang, Z., **Xu, Y.**, Yin, L. and Zhao, Z. Revealing temporal stay patterns in human mobility using large-scale mobile phone location data. *Transactions in GIS* (in press).
- Yu, Z., Zhu, X., Liu, X., Wei, T., Yuan, H., **Xu, Y.**, et al. Reopening International Borders without Quarantine: Contact Tracing Integrated Policy against COVID-19. *International Journal of Environmental Research and Public Health*, 18(14), 7494.
- **Xu, Y.**, Xue, J., Park, S. and Yue, Y. Towards a multidimensional view of tourist mobility patterns in cities: A mobile phone data perspective. *Computers, Environment and Urban Systems*, 86, p101593.
- Kwok, C.Y.T., Wong, M.S., Chan, K.L., Kwan, M.P., Nichol, J.E., Liu, C.H., Wong, J.Y.H., Wai, A.K.C., Chan, L.W.C., **Xu, Y.** and Li, H. Spatial analysis of the impact of urban geometry and socio-demographic characteristics on COVID-19, a study in Hong Kong. *Science of The Total Environment*, 90, p102901.
- Zhou, Y., Thill, J.C., **Xu, Y.** and Fang, Z. Variability in individual home-work activity patterns. *Journal of Transport Geography*, 90, p102901.
- 2021 **Xu, Y.**, Li, J., Belyi, A. and Park, S. Characterizing destination networks through mobility traces of international tourists A case study using a nationwide mobile positioning dataset. *Tourism Management*, 82, p.104195
- 2020 **Xu, Y.**, Li, J., Xue, J., Park, S. and Li, Q. Tourism geography through the lens of time use A computational framework using fine-grained mobile phone data. *Annals of the American Association of Geographers* 111(5), 1420-1444.
- **Xu, Y.**, Li, X., Shaw, S. L., Lu, F., Yin, L. and Chen, B. Effects of data preprocessing methods on addressing location uncertainty in mobile signaling data. *Annals of the American Association of Geographers*, 111(2), 515-539.
- Park, S., **Xu, Y.**, Jiang, L., Chen, Z. and Huang, S. Spatial structures of tourism destinations: A trajectory data mining approach leveraging mobile big data. *Annals of Tourism Research*, 84, p. 102973. (IFITT Journal Paper of the Year Award)
- Tu, W., Mai, K., Zhang, Y., **Xu, Y.**, Huang, J., Deng, M., Chen, L. and Li, Q. Real-time Route Recommendations for E-Taxies Leveraging GPS Trajectories. *IEEE Transactions on Industrial Informatics*, 17(5), pp.3133-3142.

- Zhao, P., **Xu, Y.**, Liu, X. and Kwan, M.P. Space-time dynamics of cab drivers' stay behaviors and their relationships with built environment characteristics. *Cities*, 101, p.102689.
- **Xu, Y.**, Belyi, A., Santi, P. and Ratti, C. Quantifying segregation in an integrated urban physical-social space. *Journal of the Royal Society Interface*, 16(160), 20190536.
- Yu, H., Fang, Z., Lu, F., Murray, A.T., Zhao, Z., Xu, Y. and Yang, X. Massive Automatic Identification System Sensor Trajectory Data-Based Multi-Layer Linkage Network Dynamics of Maritime Transport along 21st-Century Maritime Silk Road. *Sensors*, 19(19), p.4197.
- Jia, T., Yu, X., Shi, W., Liu, X., Li, X., and **Xu, Y.** Detecting the regional delineation from a network of social media user interactions with spatial constraint: A case study of Shenzhen, China. *Physica A: Statistical Mechanics and its Applications*, 121719.
- Yang, X., Fang, Z., **Xu, Y.**, Yin, L., Li, J. and Lu, S. Spatial heterogeneity in spatial interaction of human movements Insights from large-scale mobile positioning data. *Journal of Transport Geography*, 78, 29-40
- Xu, Y., Chen, D., Zhang, X., Tu, W., Chen, Y., Shen, Y. and Ratti, C. Unravel the landscape and pulses of cycling activities from a dockless bike-sharing system. *Computers, Environment and Urban Systems*, 75, 184-203. (ESI Highly Cited Paper & ESI Hot Paper)
- Zhang, X., **Xu, Y.**, Tu, W. and Ratti, C. Do different datasets tell the same story about urban mobility A comparative study of public transit and taxi usage. *Journal of Transport Geography*, 70, pp.78-90.
- Zhu, J., **Xu, Y.**, Fang, Z., Shaw, S.L. and Liu, X. Geographic Prevalence and Mix of Regional Cuisines in Chinese Cities. *ISPRS International Journal of Geo-Information*, 7(5), p.183.
- 2018 **Xu, Y.**, Belyi, A., Bojic, I. and Ratti, C. Human mobility and socioeconomic status: Analysis of Singapore and Boston. *Computers, Environment and Urban Systems*. 72, 51-67. (ESI Highly Cited Paper)
- Tu, W., Cao, J., Yue, Y., Shaw, S.L., Zhou, M., Wang, Z., Chang, X., **Xu, Y.** and Li, Q., 2017. Coupling mobile phone and social media data: a new approach to understanding urban functions and diurnal patterns. *International Journal of Geographical Information Science*, 31(12), 2331-2358.
- Fang, Z., Yang, X., **Xu, Y.**, Shaw, S.L. and Yin, L., 2017. Spatiotemporal model for assessing the stability of urban human convergence and divergence patterns. *International Journal of Geographical Information Science*, 31(11), 2119-2141.
- Xu, Y., Belyi, A., Bojic, I. and Ratti, C. How Friends Share Urban Space: An Exploratory Spatiotemporal Analysis Using Mobile Phone Data. *Transactions in GIS*, 21(3), pp.468-487.
- Xu, Y., Wang, D., Janjusic, T., Wu, W., Pei, Y. and Yao, Z., 2017. A Web-based Visual Analytic Framework for Understanding Large-scale Environmental Models: A Use Case for The Community Land Model. *Procedia Computer Science*, 108, pp.1731-1740.
- Xu, Y., Wang, D., Iverson, C., Walker, A. and Warren, J. Building a Virtual Ecosystem Dynamic Model for Root Research. *Environmental Modelling & Software*, 89(C), 97-105.
- Yang, X., Fang, Z., **Xu, Y.**, Shaw, S-L., Zhao, Z., Yin, L., Zhang, T. and Lin Y. Understanding Spatiotemporal Patterns of Human Convergence and Divergence Using Mobile Phone Location Data. *ISPRS International Journal of Geo-Information*, 5(10), 177.
- 2016 **Xu, Y.**, Shaw, S-L., Fang, Z. and Yin, L. Estimating Potential Demand of Bicycle Trips from Mobile Phone Data An Anchor Point Based Approach. *ISPRS International Journal of Geo-Information*, 5(8), 131.

- He, H., Wang, D., **Xu, Y**. and Tan, J. Data synthesis in the Community Land Model for ecosystem simulation. *Journal of Computational Science*, 13, 83-95.
- 2016 **Xu, Y.**, Shaw, S-L., Zhao, Z., Yin, L., Lu, F., Chen, J., Fang, Z. and Li, Q. Another Tale of Two Cities Understanding Human Activity Space Using Actively Tracked Cellphone Location Data. *Annals of the American Association of Geographers*, 106(2), 489-502.
- Zhao, Z., Shaw, S-L., **Xu, Y.**, Lu, F., Chen, J. and Yin, L. Understanding the Bias of Call Detail Records in Human Mobility Research. *International Journal of Geographical Information Science*, 30(9), 1738-1762.
- **Xu, Y.**, Shaw, S-L., Zhao, Z., Yin, L., Fang, Z. and Li. Q. Understanding aggregate human mobility patterns using passive mobile phone location data: a home-based approach. *Transportation*, 42(4), 625-646.
- Wang, D., **Xu, Y.**, Thornton, P., King, A., Steed, C., Gu, L. and Schuchart, J. A functional test platform for the Community Land Model. *Environmental Modelling & Software*, 55, 25-31.
- Wang, D., Schuchart, T., Janjusic, T., Winkler, F., **Xu, Y.** and Kartsaklis. Toward Better Understanding of the Community Land Model within the Earth System Modeling Framework. *Procedia Computer Science*, 29, 1515-1524.
- 2011 **Xu, Y.**, Li, Q. and Tang, L. Road Damage Detection from Remote Sensing Imagery Based on Road Network Vector Data. *Bulletin of Surveying and Mapping*, 4, 14-16 (in Chinese).

## C. Book Chapters

- 2019 **Xu, Y.** and Ratti, C. Conquer the Divided Cities. *Towards a New Enlightenment: A Transcend Decade*. pp.428-455. BBVA Open Mind, Spain.
- Liu, X., Xu, Y. and Ye, X. Outlook and Next Steps: Integrating social network and spatial analyses for urban research in the new data environment. In *Cities as Spatial and Social Networks*, pp. 227-238. Springer, Cham.
- 2018 **Xu. Y.**, Shaw, S-L., Lu, F., Chen, J. and Li, Q. Uncovering the Relationships Between Phone Communication Activities and Spatiotemporal Distribution of Mobile Phone Users. In *Human Dynamics Research in Smart and Connected Communities*, pp. 41-65, Springer, Cham.

### **D.** Conference Proceedings

- 2020 Luo, Y., Xiang, L., **Xu, Y.** and Gui, Z., 2020. Road Network Extraction from GPS Trajectories–A Tensor Voting Based Algorithm. *Proceedings of the GISRUK 2020, London.*
- **Xu, Y.,** Shaw, S-L., Yin, L. and Zhao, Z. Understanding Individual Daily Activity Spaces Based on Large Scale Mobile Phone Location Data. *Proceedings of The 13th International Conference on GeoComputation*. Dallas, Texas, USA. pp. 256-261.
- **Xu, Y.**, Wang, D., Janjusic, T. and Xu, X. A Web-based Visual Analytic System for Understanding the Structure of Community Land Model. *Proceedings of The 13th International Conference on Software Engineering Research and Practice.* Las Vegas, NV. USA. pp. 3-9.
- Wang, D. and **Xu. Y**. Software Engineering for Scientific Application: Effort Report on The Community Land Model within the Earth System Modeling Framework. *Proceedings of The 7th International Congress on Environmental Modelling and Software*. San Diego, CA, USA.

**Xu, Y.,** Shaw, S-L., Chen, J., Li, Q., Fang, Z. and Li, Y. Uncover Repeated Spatiotemporal Behavioral Patterns Embedded in GPS-based Taxi Tracking Data. *Proceedings of The 7th International Conference on Geographic Information Science* (Extended abstract). Columbus, OH, USA.

## E. Presentations Delivered at Professional Conferences

2020	"大数据视角下的旅游地理与游客时间分配",第十六届空间行为与规划研究会,厦门大学,December 12.
2020	"A new approach to understanding spatial and social-network segregation in cities", Virtual Symposium on Big Data and Neighborhood Change, The University of Sydney & University of California, Berkeley, August 10-25.
2019	"Unravel the Landscape and Pulses of Cycling Activities From A Dockless Bike-Sharing System – A case study of Singapore", presentation at the $26^{th}$ ITS World Congress, Singapore, October 21-25.
2019	"Uncover Spatiotemporal Dynamics of Cycling Activities From A Dockless BikeSharing System", presentation at the 16th International Conference on Computers in Urban Planning and Urban Management (CUPUM), Wuhan, China, July 8-12.
2019	"Unravel the Landscape and Pulses of Cycling Activities From A Dockless Bike-Sharing System", presentation at the 2 <sup>nd</sup> International Conference on Urban Informatics (ICUI), Hong Kong, China, June 24-26.
2018	"Human Mobility and Socioeconomic Status: Analysis of Singapore and Boston", presentation at The 2018 Annual Meeting of the American Association of Geographers. New Orleans, USA, April 10-14.
2017	"How Friends Share Urban Space – Evidence From Mobile Phone Data", presentation at The 2017 Esri User Conference. San Diego, CA, USA, July 10-14.
2017	"How Friends Share Urhan Space – An Exploratory Spatiotemporal Analysis Using Mobile Phone Data", presentation at The 2017 Annual Meeting of the American Association of Geographers. Boston, USA, April 5-9.
2016	"Comparing Home Detection Methods Through Multi-Source Geo-Social Data", Future Urban Mobility Symposium 2016, National University of Singapore, Singapore, July 25-26 (Poster Presentation).
2015	"Understanding Individual Daily Activity Spaces Based on Large Scale Mobile Phone Location Data", presentation at the GeoComputation 2015 Conference, Dallas, Texas, USA, May 20-23.
2014	"Understand Individual and Aggregate Human Mobility Patterns from Mobile Phone Location Data — A Case Study in Shenzhen, China", presentation at The 2014 Annual Meeting of the Association of American Geographers, Tampa, Florida, USA, April 8-12.
2014	"A Web-based Visual Analytic System for Understanding the Structure of Community Land Model", presentation at The 2014 International Conference on Software Engineering Research and Practice, Las Vegas, NV, USA, July 21-24.
2013	"Exploring spatiotemporal changes of user generated content from Flickr data", presentation at The 2014 Annual Meeting of the Association of American Geographers, Los Angeles, CA, USA, April 9-13.
2012	"Uncover Repeated Spatiotemporal Behavioral Patterns Embedded in GPS-based Taxi Tracking Data", presentation at The 2012 International Conference on Geographic Information Science, Columbus, OH, USA, September 18-21.

## F. Invited Talks and Guest Presentations

2021/06	Invited talk at School of Geography and Planning, Sun Yat-Sen University ("科技论文中的数据可视化与表达")
2021/05	Invited panel speech at Smart Tourism in the Great Bay Area Forum, organized by The School of Hotel and Tourism Management The Hong Kong Polytechnic University ("Understanding tourist travel behavior from cellphone big data")
2021/04	Invited talk by GeoInsider ("Using cellphone big data to measure human mobility and interactions in cities")
2021/03	Guest lecture at the School of Architecture and Urban Planning, Shenzhen University ("Big Data for Human Mobility")
2021/01	Guest lecture at the Department of Urban Planning and Design, Hong Kong University ("Big Data for Human Mobility")
2019/11	Invited talk at the School of Urban Informatics, Shenzhen University ("Quantifying segregation in an integrated urban physical-social space")
2019/11	Invited talk at the School of Resource and Environmental Sciences, Wuhan University ("Big Data for Smart Urban Mobility")
2019/06	Invited talk at the School of Urban Informatics, Shenzhen University ("Urban Informatics – Some Practice and Thoughts")
2019/06	Invited talk at the School of Resource and Environmental Sciences, Wuhan University ("Urban Informatics and Applications for Smart Cities")
2019/06	Invited talk at the School of Urban Design, Wuhan University ("Urban Informatics and Applications for Smart Cities")
2019/06	Invited talk at the Central China Normal University ("Urban Informatics and Applications for Smart Cities")
2019/04	Invited DBA Public Lecture at the Faculty of Business, The Hong Kong Polytechnic University, Hong Kong ("Future of Urban Sensing and Smart Cities")
2019/04	Invited talk at the FCE Translational Research Forum on Sustainable Urban Development in the Greater Bay Area, The Hong Kong Polytechnic University, Hong Kong ("Big Data for Sustainable Urban Mobility")
2018/10	Invited talk at the Hong Kong FinTech Week – FinTech and Beyond, Hong Kong, China ("Latest Research Progress in Smart Cities").
2018/06	Invited talk at Sinagpore-MIT Alliance for Research and Technology (SMART), Singapore ("Quantifying Urban Dynamics Using Large-Scale Mobility Datasets").
2018/03	Invited speech at the Workshop on Urban and Transport Analytics, Hong Kong Baptist University ("Urban Analytics – A Mobile Phone Data Perspective").
2018/01	Invited seminar talk at the Institute of Space & Earth Information Science, Chinese University of Hong Kong ("Urban Sensing – A Mobile Phone Data Perspective").
2017/11	Invited speech at 2017 中国地理信息科学理论与方法学术年会 ("Sensing Urban and Social Dynamics Using Large-Scale Mobile Phone Data").
2017/06	Invited keynote speech at 2017 EmTech Hong Kong Conference ("SENSEable Cities").
2016/10	Invited seminar talk at Sinagpore-MIT Alliance for Research and Technology (SMART), Singapore ("How Friends Share Urban Space: Evidence from Mobile Phone Data").
2016/06	Invited presentation at School of Remote Sensing and Information Engineering, Wuhan University, Wuhan, China ("Mobility and Activity Space: Understanding Human Dynamics from Mobile Phone Location Data").

2016/04 Invited presentation at the 3<sup>rd</sup> Wuhan University International Forum for Interdisciplinary Sciences

and Engineering, Wuhan, China ("Mobility and Activity Space: Understanding Human Dynamics from

Mobile Phone Location Data").

## **HONORS AND AWARDS**

2021	International Federation for IT and Travel & Tourism (IFITT) Journal Paper of the Year Award 2021 (Second Place)
	Awarded Paper: Spatial structures of tourism destinations: A trajectory data mining approach leveraging mobile big data, Annals of Tourism Research
2020	Fast Company's Innovation by Design Award (Honorable Mention, Data Design Category)
	Awarded Project: "Singapore Calling"
2020	LSGI's Awards for Excellent Performance / Achievement in Teaching, Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University
2020	Successful recruitment of awardee of the Hong Kong PhD Fellowship Scheme
2019	Successful recruitment of awardee of the Hong Kong PhD Fellowship Scheme
2018	LSGI's Awards for Excellent Performance / Achievement in Teaching, Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University
2015	Exceptional Professional Accomplishment Award, Department of Geography, The University of Tennessee, Knoxville
2015	NSF Travel Award, The 13th International Conference of GeoComputation
2015	Graduate Student Publication Award, Department of Geography, The University of Tennessee, Knoxville
2014	Graduate Student Publication Award, Department of Geography, The University of Tennessee, Knoxville
2011	Outstanding Graduate Student, Wuhan University, China
	Second-class Scholarship for Graduate Student, Wuhan University, China
2007	First-class Undergraduate Scholarship, Wuhan University, China
2006	First-class Undergraduate Scholarship, Wuhan University, China

## **TEACHING**

# A. University Courses Offered

CE634	Urban Big Data (PhD Level)
LSGI524	Urban Big Data (Master Level)
LSGI544	Urban Science and Systems
LSGI3431A	System Customization and Development
LSGI3243A	Geospatial Database
LSGI3292A	Internet GIS and Web Services
LSGI4653A	Utility Data Management

#### **SERVICE**

## A. Reviewer of Manuscripts for the Following Journals

ACM Transactions on Knowledge Discovery from Data

Annals of the American Association of Geographers

Annals of Tourism Research

Applied Geography

Cities

Computers, Environment and Urban Systems

Ecosystem Services

Environment and Planning B: Urban Analytics and City Science

**EPJ** Data Science

IEEE Intelligent Transportation Systems Magazine

IEEE Transactions on Big Data

IEEE Transactions on Systems, Man, and Cybernetics: Systems

International Journal of Applied Earth Observations and Geoinformation

International Journal of Geographical Information Science

International Journal of Sustainable Transportation

International Journal of Tourism Research

Journal of Geographical Systems

Journal of Rural Studies

Journal of The Royal Society Interface

Journal of Transport Geography

Transactions in GIS

Transportation Research Part A: Policy and Practice

Transportation Research Part C: Emerging Technologies

Transportmetrica A: Transport Science

Travel Behaviour and Society

Tourism Geographies

## B. Guest Editor for the Following Journals

Special issue on "Human Dynamics Research in the Age of Smart and Intelligent Systems", ISPRS

International Journal of Geo-Information

#### C. Organizer/Chair for Conference Sessions and Workshops

2020 Chair, Co-Organizer, Symposium on Human Dynamics Research: Spatial-Social Networks and

Network Science, Annual Conference of American Association of Geographers, Denver, USA,

April 6-10.

2019 Co-Organizer, Workshop on "Smart Mobility and Big Data", RISUD Annual International

Symposium, Hong Kong, China, November 25-26.

2018 Chair, Co-Organizer, Symposium on New Horizons in Human Dynamics Research: Spatial-Social Networks in GIS (I), Annual Conference of American Association of Geographers, New Orleans, USA, April 10-14.

2018 Co-Organizer, Symposium on New Horizons in Human Dynamic Research: Time-Geography – a way of thinking, Annual Conference of American Association of Geographers, New Orleans, USA, April 10-14.

## D. Service to the Professional Society

Board Member, Chinese Professionals in Geographic Information Sciences (CPGIS), 2018 – 2020 Member, American Association of Geographers, 2015 – present

## E. Service to the University

Program leader, MSc in Urban Informatics and Smart Cities, Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University, 2020 – present;

Deputy program leader, MSc in Geomatics, Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University, 2018 – present;

Department program exchange officer, Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University, 2018 – present