Fengli Xu

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Research Interests

My research interests lie in the interdisciplinary area of *Computational Social Science*, *Urban Science* and *Data Science*, aiming to develop scientific methods and artificial intelligence tools to address the long-standing puzzles in complex networks arise from human behavior and social interactions. My research aims to fully exploit the opportunities offered by recent data explosion and push forward the boundary of computational social science research with novel *Data Science/AI* techniques.

Keywords: Computational Social Science, Data Science, Urban Science, Complex System, Network Science

Education & Career

The University of Chicago, U.S. (Aug. 2020 – Present)
Postdoc Fellow in *Mansueto Institute & KLab*.
Advisor: **Prof. Luis Bettencourt** and **Prof. James Evans**

Hong Kong University of Science & Technology, Hong Kong (Feb. 2020 – Aug. 2020)
Postdoc Researcher in *SyMLab*.
Advisor: **Prof. Pan Hui**

Tsinghua University, China (Sep. 2015 – Jan. 2020)
Ph.D. in *Department of Electronic Engineering*
Advisor: **Prof. Yong Li**
Graduate with Distinction

Huazhong University of Science and Technology, China (Sep. 2011 – Jul. 2015)
B.S. in *Department of Electronic Engineering*
Graduate with Distinction

Research Experience

Microsoft Research Asia, China (Oct. 2018 – Jan. 2019)
Research Intern, with **Prof. Xing Xie** in *Social Computing Group*.

Tencent Inc., Beijing, China (Dec. 2016 – May 2017)
Research Scientist Intern, *Mobile Data Mining Team*.

Georg-August-University of Goettingen, Germany (Jun. 2016 – Sep. 2016)
Visiting Researcher, with **Prof. Xiaoming Fu** in *Computer Networks Research Group*.

Tsinghua University, Beijing, China (Sep. 2015 – Jan. 2020)
Research Assistant, with **Prof. Yong Li** in *FIB Lab*.

Honors and Awards

Mansueto Institute Fellowship	2021
ACM SIGSPATIAL China Chapter Doctoral Dissertation Award	2020
CCF PhD Doctoral Dissertation Award Nominee	2020
Excellent Doctoral Dissertation of Tsinghua University	2020
Outstanding PhD Graduate of Tsinghua University	2020
MSRA Fellowship	2018
Outstanding Oral Presentation Award in Tsinghua PhD Forum	2017
ACM UBICOMP Honorable Mention Award	2016
National Graduate Student Scholarship of China	2016
Outstanding Graduate of Huazhong University of Science and Technology	2015
National Undergraduate Student Scholarship of China	2014

Publications

Journal Publications ($*$ equal contributions):

18. **Fengli Xu**, L. Wu, and J. Evans. Flat Teams Drive Scientific Innovation. To appear in *Proceedings of the National Academy of Sciences (PNAS)*.

17. **Fengli Xu**, Y. Li, D. Jin, J. Lu, and C. Song. Emergence of Urban Growth Patterns from Human Mobility Behavior. *Nature Computational Science*, 1.12 (2021): 791-800.

16. L. Chen*, **Fengli Xu***, Z. Han, K. Tang, P. Hui, J. Evans, and Y. Li. Strategic COVID-19 vaccine distribution can simultaneously elevate social utility and equity. To appear in *Nature Human Behavior*.

15. Z. Han*, **Fengli Xu***, Y. Li, T. Jiang, and J. Evans. Urban Mobility Model Reduces Data Demands for Estimating COVID-19 Growth and Informs Reopening Policy. In submission to *Nature Communications*.

14. Y. Yuan, **Fengli Xu**, H. Cao, G. Zhang, P. Hui, Y. Li, and D. Jin. Persuade to Click: Context-aware Persuasion Model for Online Textual Advertisement. *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 2021.

13. **Fengli Xu**, and Y. Li. Survey on user mobility behavior modelling in urban environment. *Journal on Communications* (in Chinese), 2020, 41(7): 18-28.

12. T. Xia, Y. Li, Y. Yu, **Fengli Xu**, Q. Liao, and D. Jin. Understanding urban dynamics via state-sharing hidden markov model. *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 33.10 (2020): 3468-3481.

11. **Fengli Xu**, Y. Li, Z. Tu, S. Chang, and H. Huang. No More than What I Post: Preventing Linkage Attacks on Check-in Services. *IEEE Transactions on Mobile Computing (TMC)*, 20.2 (2019): 620-633.

10. **Fengli Xu**, Z. Tu, and Y. Li. Connecting the Dots: User Privacy Is NOT Preserved in ID-removed Cellular Data. *IEEE Transactions on Network and Service Management (TNSM)*, 17.1 (2019): 147-159.

9. H. Cao, **Fengli Xu**, J. Sankaranarayanan, Y. Li, and H. Samet. Habit2vec: Trajectory Semantic Embedding for Living Pattern Recognition in Population. *IEEE Transactions on Mobile Computing (TMC)*, 19.5 (2019): 1096-1108.

8. K. Zhao, Z. Tu, **Fengli Xu**, Y. Li, P. Zhang, D. Pei, L. Su, and D. Jin. Walking without friends: Publishing anonymized trajectory dataset without leaking social relationships. *IEEE Transactions on Network and Service Management (TNSM)*, 16.3 (2019): 1212-1225.

7. Z. Tu, **Fengli Xu**, Y. Li, P. Zhang, and D. Jin. A New Privacy Breach: User Trajectory Recovery From Aggregated Mobility Data. *IEEE/ACM Transactions on Networking (TON)*, 26.3 (2018): 1446-1459.

6. J. Feng, Y. Li, **Fengli Xu**, and D. Jin. A Bimodal Model to Estimate Dynamic Metropolitan Population by Mobile Phone Data. *Sensors*, 18.10 (2018): 3431.

5. Z. Tu, K. Zhao, **Fengli Xu**, Y. Li, L. Su, and D. Jin. Protecting Trajectory From Semantic Attack Considering *k*-Anonymity, *l*-Diversity, and *t*-Closeness. *IEEE Transactions on Network and Service Management (TNSM)*, 16.1 (2018): 264-278.

4. **Fengli Xu**, Y. Li, H. Wang, P. Zhang, and D. Jin. Understanding Mobile Traffic Patterns of Large Scale Cellular Towers in Urban Environment. *IEEE/ACM Transactions on Networking (TON)*, 25.2 (2016): 1147-1161.

3. **Fengli Xu**, Y. Li, M. Chen, and S. Chen. Mobile Cellular Big Data: Link Cyberspace and Physical World with Social Ecology. *IEEE Network*, 30.3 (2016): 6-12.

2. **Fengli Xu**, Y. Lin, J. Huang, D. Wu, H. Shi, J. Song, and Y. Li. Big Data Driven Mobile Traffic Understanding and Forecasting: A Time Series Approach. *IEEE Transaction on Service Computing (TSC)*, 9.5 (2016): 796-805.

1. Y. Li, and **Fengli Xu**. Trace-driven analysis for location-dependent pricing in mobile cellular networks. *IEEE Network*, 30.2 (2016): 40-45.

Conference Publications († corresponding author):

35. Y. Zhang, **Fengli Xu**†, L. Chen, Y. Yuan, J. Evans, and L. Bettencourt. Identifying Mobility Inequality in Urban Space with Large-scale Open Data. In Submission to *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, (2022).

34. L. Chen, **Fengli Xu**†, and P. Hui. Getting Back on Track: Understanding the Impact of Covid-19 on Urban Mobility and Experienced Segregation In Submission to *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, (2022).

33. **Fengli Xu**, Q. Yao, P. Hui, and Y. Li. Automorphic Equivalence-aware Graph Neural Network. *Advances in Neural Information Processing Systems (NeurIPS)*, 34 (2021).

32. Y. Zhang, **Fengli Xu**†, T. Xia, Y. Li. Quantifying the Causal Effect of Individual Mobility on Health Status in Urban Space. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 5.4 (2021): 1-30.

31. Q. Hao, **Fengli Xu**†, L. Chen, P. Hui, and Y. Li. Hierarchical Reinforcement Learning for Scarce Medical Resource Allocation with Imperfect Information. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2021.

30. **Fengli Xu**, G. Zhang, Y. Yuan, H. Huang, D. Yang, D. Jin, and Y. Li. Understanding the Invitation Acceptance in Agent-initiated Social E-commerce. *International AAAI Conference on Web and Social Media (ICWSM)*. Vol. 15. 2021.

29. J. Piao, G. Zhang, **Fengli Xu**, Z. Chen, Y. Zheng, C. Gao, and Y. Li. Bringing Friends into the Loop of Recommender Systems: An Exploratory Study. *ACM on Human-Computer Interaction (CSCW)*, 5.CSCW2 (2021): 1-26.

28. Z. Chen, H. Cao, Y. Deng, X. Gao, J. Piao, **Fengli Xu**, Y. Zhang, and Y. Li. Learning from Home: A Mixed-Methods Analysis of Live Streaming Based Remote Education Experience in Chinese Colleges during the COVID-19 Pandemic. *SIGCHI Conference on Human Factors in Computing Systems (SIGCHI)*, 2021.

27. Z. Han, H. Fu, **Fengli Xu**, Z. Tu, Y. Yu, P. Hui, and Y. Li. Who Will Survive and Revive Undergoing the Epidemic: Analyses about POI Visit Behavior in Wuhan via Check-in Records. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 5.2 (2021): 1-20.

26. J. Piao, G. Zhang, **Fengli Xu**, Z. Chen, and Y. Li. Predicting Customer Value with Social Relationships via Motif-based Graph Attention Networks. *The Web Conference (WWW)*, 2021.

25. G. Zhang, Y. Li, Y. Yuan, **Fengli Xu**, H. Cao, Y. Xu, and D. Jin. Community Value Prediction in Social E-commerce. *The Web Conference (WWW)*, 2021.

24. Y. Zhang, **Fengli Xu**[†], T. Li, V. Kostakos, P. Hui, and Y. Li. Passive Health Monitoring Using Large Scale Mobility Data. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 5.1 (2021): 1-23.

23. T. Xia, Y. Qi, J. Feng, **Fengli Xu**, F. Sun, D. Guo, and Y. Li. AttnMove: History Enhanced Trajectory Recovery via Attentional Network. *AAAI Conference on Artificial Intelligence (AAAI)*, 35.5 (2021).

22. **Fengli Xu**, Y. Li, and S. Xu. Attentional Multi-graph Convolutional Network for Regional Economy Prediction with Open Migration Data. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2020.

21. **Fengli Xu**, Z. Lin, T. Xia, D. Guo, and Y. Li. SUME: Semantic-enhanced Urban Mobility Network Embedding for User Demographic Inference. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 4.3 (2020): 1-25.

20. Z. Lin, S. Lyu, H. Cao, **Fengli Xu**, Y. Wei, H. Samet, and Y. Li. HealthWalks: Sensing Fine-grained Individual Health Condition via Mobility Data. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 4.4 (2020): 1-26.

19. Z. Han, **Fengli Xu**, J. Shi, Y. Shang, H. Ma, P. Hui, and Y. Li. Genetic Meta-Structure Search for Recommendation on Heterogeneous Information Network. *ACM International Conference on Information and Knowledge Management (CIKM)*, 2020.

18. Z. Chen, H. Cao, **Fengli Xu**, M. Cheng, T. Wang, and Y. Li. Understanding the Role of Intermediaries in Online Social E-commerce: An Exploratory Study of Beidian. *ACM on Human-Computer Interaction (CSCW)*, 4.CSCW2 (2020): 1-24.

17. Z. Chen, H. Cao, H. Wang, and **Fengli Xu**, V. Kostakos, and Y. Li. Will You Come Back/Check-in Again? Understanding Characteristics Leading to Urban Revisitation and Re-check-in. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 4.3 (2020): 1-27.

16. Q. Hao, L. Chen, **Fengli Xu**[†], and Y. Li. Understanding the Urban Pandemic Spreading of COVID-19 with Real World Mobility Data. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2020.

15. J. Feng, Z. Yang, **Fengli Xu**, H. Yu, M. Wang, and Y. Li. Learning to Simulate Human Mobility. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2020.

14. H. Cao, Z. Chen, **Fengli Xu**, Y. Li, and T. Wang. When Your Friends Become Sellers: An Empirical Study of Social Commerce Site Beidian. *International AAAI Conference on Web and Social Media (ICWSM)*, Vol. 14. 2020.

13. **Fengli Xu**, J. Lian, Z. Han, Y. Li, Y. Xu, and X. Xie. Relation-Aware Graph Convolutional Networks for Agent-Initiated Social E-Commerce Recommendation. *Conference on Information and Knowledge Management (CIKM)*, 2019.

12. **Fengli Xu**, Z. Han, J. Piao, and Y. Li. "I Think You'll Like It": Modelling the Online Purchase Behavior in Social E-commerce. *ACM on Human-Computer Interaction (CSCW)*, 3.CSCW (2019): 1-23.

11. H. Cao, Z. Chen, **Fengli Xu**, Y. Li, and V. Kostakos. Revisitation in Urban Space vs. Online: A Comparison across POIs, Websites, and Smartphone Apps. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 2.4 (2018): 1-24.

10. **Fengli Xu**, Z. Tu, H. Huang, S. Chang, F. Sun, D. Guo, and Y. Li. No More than What I Post: Preventing Linkage Attacks on Check-in Services. *The Web Conference (WWW)*, 2019.

9. T. Xia, Y. Yu, **Fengli Xu**, F. Sun, D. Guo, D. Jin, and Y. Li. Understanding Urban Dynamics via State-sharing Hidden Markov Model. *The Web Conference (WWW)*, 2019.

8. **Fengli Xu**, T. Xia, H. Cao, Y. Li, F. Sun, and F. Meng. Detecting Popular Temporal Modes in Population-scale Unlabelled Trajectory Data. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 2.1 (2018): 1-25.

7. **Fengli Xu**, G. Zhang, J. Huang, Y. Li, D. Yang, B. Zhao, and F. Meng. Understanding Motivations behind Inaccurate Check-ins. *ACM on Human-Computer Interaction (CSCW)*, 2.CSCW (2018): 1-22.

6. D. Yu, Y. Li, **Fengli Xu**, P. Zhang, and V. Kostakos. Smartphone App Usage Prediction Using Points of Interest. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 1.4 (2018): 1-21.

5. **Fengli Xu**, Z. Tu, Y. Li, P. Zhang, X. Fu, and D. Jin. Trajectory Recovery From Ash: User Privacy Is NOT Preserved in Aggregated Mobility Data. *International Conference on World Wide Web (WWW)*, 2017.

4. Z. Tu, K. Zhao, **Fengli Xu**, Y. Li, L. Su, and D. Jin. Beyond k-anonymity: protect your trajectory from semantic attack. *IEEE International Conference on Sensing, Communication, and Networking (SECON)*, 2017.

3. J. Huang, **Fengli Xu**, Y. Lin, and Y. Li. On the Understanding of Interdependency of Mobile App Usage. *IEEE International Conference on Mobile Ad Hoc and Sensor Systems (MASS)*, 2017.

2. **Fengli Xu**, J. Feng, P. Zhang, and Y. Li. Context-aware Real-time Population Estimation for Metropolis. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 2016.

1. M. Zhang, **Fengli Xu**, and Y. Li. Mobile Traffic Data Decomposition for Understanding Human Urban Activities. *IEEE International Conference on Mobile Ad Hoc and Sensor Systems (MASS)*, 2016.

Talks & Presentations

- Hidden Hierarchy in Scientific Teams and Research Output. Center for Science of Science and Innovation (CSSI), Northwestern University. Invited Talk. 25/08/2021

- Human Mobility Behavior Modeling in Urban Space. ACM Sigspatial China, Dissertation Award Ceremony. Invited Talk. 20/04/2021

- Structure of Research Team and Scientific Output. Department of Sociology, Zhejiang University, Invited Talk. 22/10/2021.

- Policy-Aware Mobility Model Explains the Growth of COVID-19 within U.S. Cities. International conference on social computation (ICSC), Invited Talk. 15/12/2020

- Strategic COVID-19 Vaccine Distribution Can Simultaneously Improve Social Utility and Equity. Knowledge Lab, University of Chicago, Seminar. 11/10/2021

- Human Mobility in Urban Space: COVID-19 Risk and City Structure. Mansueto Institute for Urban Innovation, University of Chicago, Seminar. 23/02/2021

- Data-driven Human Dynamic Modeling. Computer Science and Engineering Department, Hongkong Univ. of Sci.& Tech., Seminar. 08/08/2020

- Automorphic Equivalence-aware Graph Neural Network. Conference on Neural Information Processing Systems (NeurIPS), online. Conference Presentation. 07/12/2021.

- Understanding the Invitation Acceptance in Agent initiated Social E-commerce. International AAAI Conference on Web and Social Media (ICWSM), online. Conference Presentation. 10/06/2021

- Attentional Multi-graph Convolutional Network for Regional Economy Prediction with Open Migration Data. ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), online. Conference Presentation. 23/08/2020

Professional Activity

(Senior) PC Member:
International Joint Conference on Artificial Intelligence(IJCAI), 2020, 2021, 2022.
The Web Conference(WWW), 2021, 2022.
AAAI Conference on Artificial Intelligence(AAAI), 2021, 2022.
CPD Workshop (UBICOMP), 2019, 2020.
AppLens Workshop (UBICOMP), 2019.

Conference External Reviewing:
International Conference on Database Systems for Advanced Applications(DASFAA), 2021.
International Joint Conference on Pervasive and Ubiquitous Computing(UBICOMP), 2017~2021.
ACM SIGKDD Conference on Knowledge Discovery and Data Mining(KDD), 2019.
International World Wide Web Conference(WWW), 2017, 2018, 2019.
International AAAI Conference on Web and Social Media(ICWSM), 2017.
IEEE International Conference on Computer Communications(INFOCOM), 2017.
ACM Internet Measurement Conference(IMC), 2016, 2017, 2018.

Journal Reviewing:
The Proceedings of the National Academy of Sciences (PNAS), 2021, 2022.
Nature Communications, 2021.
ACM Transactions on Intelligent Systems and Technology (TIST), 2021.
IEEE Transactions on Network and Service Management (TNSM), 2018, 2019, 2020.
IEEE Transactions on Mobile Computing (TMC), 2017, 2019.
IEEE Communications Magazine, 2017.
IEEE Transactions on Services Computing (TSC), 2017.