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

Tsinghua University, Beijing, 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, Wuhan, China (Sep. 2011 – Jul. 2015).
B.S. in Department of Electronic Engineering
Graduate with Distinction

Selected Research Experience

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

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

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

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

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

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

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

Featured Publications:

3. **Fengli Xu**, Lingfei Wu, James A. Evans. Flat Teams Drive Scientific Innovation. To appear in *Proceedings of the National Academy of Sciences (PNAS)*.

2. **Fengli Xu**, Yong Li, Depeng Jin, Jianhua Lu, Chaoming Song. Emergence of Urban Growth Patterns from Human Mobility Behavior. *Nature Computational Science*, 1.12 (2021): 791-800.

1. **Fengli Xu**, Quanming Yao, Pan Hui, Yong Li. Automorphic Equivalence-aware Graph Neural Network. *Advances in Neural Information Processing Systems (NeurIPS)*, 34 (2021).

Working Papers (∗ equal contributions):

2. Lin Chen∗, **Fengli Xu**∗, Zhenyu Han, Kun Tang, Pan Hui, James A. Evans, Yong Li. Strategic COVID-19 vaccine distribution can simultaneously elevate social utility and equity. Under Revision in *Nature Human Behavior*.

1. Zhenyu Han∗, **Fengli Xu**∗, Yong Li, Tao Jiang, James A. Evans. Urban Mobility Model Reduces Data Demands for Estimating COVID-19 Growth and Informs Reopening Policy. Under Review in *Nature Computational Science*.

Journal Publications:

14. Yuan Yuan, **Fengli Xu**, Hancheng Cao, Guozhen Zhang, Pan Hui, Yong Li, Depeng Jin. Persuade to Click: Context-aware Persuasion Model for Online Textual Advertisement. *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 2021.

13. **Fengli Xu**, Yong Li. Survey on user mobility behavior modelling in urban environment. *Journal on Communications* (in Chinese), 41.7 (2020): 18-28.

12. Tong Xia, Yong Li, Yue Yu, **Fengli Xu**, Qingmin Liao, Depeng 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**, Yong Li, Zhen Tu, Shuhao Chang, Hongjia 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**, Zhen Tu, Yong 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. Hancheng Cao, **Fengli Xu**, Jane Sankaranarayanan, Yong Li, Hamen Samet. Habit2vec: Trajectory Semantic Embedding for Living Pattern Recognition in Population. *IEEE Transactions on Mobile Computing (TMC)*, 19.5 (2019): 1096-1108.

8. Kai Zhao, Zhen Tu, **Fengli Xu**, Yong Li, Pengyu Zhang, Dan Pei, Li Su, Depeng 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. Zhen Tu, **Fengli Xu**, Yong Li, Pengyu Zhang, Depeng Jin. A New Privacy Breach: User Trajectory Recovery From Aggregated Mobility Data. *IEEE/ACM Transactions on Networking (TON)*, 26.3 (2018): 1446-1459.

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

5. Zhen Tu, Kai Zhao, **Fengli Xu**, Yong Li, Li Su, Depeng 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**, Yong Li, Huandong Wang, Pengyu Zhang, Depeng 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**, Yong Li, Min Chen, Shen Chen. Mobile Cellular Big Data: Link Cyberspace and Physical World with Social Ecology. *IEEE Network*, 30.3 (2016): 6-12.

2. **Fengli Xu**, Yujun Lin, Jiaxin Huang, Di Wu, Hongzhi Shi, Jeungeun Song, Yong 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. Yong Li, **Fengli Xu**. Trace-driven analysis for location-dependent pricing in mobile cellular networks. *IEEE Network*, 30.2 (2016): 40-45.

Conference Publications († corresponding author):

32. Yunke Zhang, **Fengli Xu†**, Tong Xia, Yong 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. Qianyue Hao, **Fengli Xu†**, Lin Chen, Pan Hui, Yong Li. Hierarchical Reinforcement Learning for Scarce Medical Resource Allocation with Imperfect Information. *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 2021.

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

29. Jinghua Piao, Guozhen Zhang, **Fengli Xu**, Zhilong Chen, Yu Zheng, Chen Gao, Yong Li. Bringing Friends into the Loop of Recommender Systems: An Exploratory Study. *ACM on Human-Computer Interaction (CSCW)*, 5.CSCW2 (2021): 1-26.

28. Zhilong Chen, Hancheng Cao, Yuting Deng, Xuan Gao, Jinghua Piao, **Fengli Xu**, Yu Zhang, Yong 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. Zhenyu Han, Haohan Fu, **Fengli Xu**, Zhen Tu, Yang Yu, Pan Hui, Yong 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. Jinghua Piao, Guozhen Zhang, **Fengli Xu**, Zhilong Chen, Yong Li. Predicting Customer Value with Social Relationships via Motif-based Graph Attention Networks. *The Web Conference (WWW)*, 2021.

25. Guozhen Zhang, Yong Li, Yuan Yuan, **Fengli Xu**, Hancheng Cao, Yujian Xu, Depeng Jin. Community Value Prediction in Social E-commerce. *The Web Conference (WWW)*, 2021.

24. Yunke Zhang, **Fengli Xu**[†], Tong Li, Vassilis Kostakos, Pan Hui, Yong 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. Tong Xia, Yunhan Qi, Jie Feng, **Fengli Xu**, Funing Sun, Diansheng Guo, Yong Li. AttnMove: History Enhanced Trajectory Recovery via Attentional Network. *AAAI Conference on Artificial Intelligence (AAAI)*, 35.5 (2021).

22. **Fengli Xu**, Yong Li, Shusheng 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**, Zongyu Lin, Tong Xia, Diansheng Guo, Yong 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. Zongyu Lin, Shiqing Lyu, Hancheng Cao, **Fengli Xu**, Yuqiong Wei, Hanan Samet, Yong 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. Zhenyu Han, **Fengli Xu**, Jinghan Shi, Yu Shang, Haorui Ma, Pan Hui, Yong Li. Genetic Meta-Structure Search for Recommendation on Heterogeneous Information Network. *ACM International Conference on Information and Knowledge Management (CIKM)*, 2020.

18. Zhilong Chen, Hancheng Cao, **Fengli Xu**, Mengjie Cheng, Tao Wang, Yong 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. Zhilong Chen, Hancheng Cao, Huangdong Wang, **Fengli Xu**, Vassilis Kostakos, Yong 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. Qianyue Hao, Lin Chen, **Fengli Xu**[†], Yong 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. Jie Feng, Zeyu Yang, **Fengli Xu**, Haisu Yu, Mudan Wang, Yong Li. Learning to Simulate Human Mobility. *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2020.

14. Hancheng Cao, Zhilong Chen, **Fengli Xu**, Yong Li, Tao 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**, Jianxun Lian, Zhenyu Han, Yong Li, Yujian Xu, Xing Xie. Relation-Aware Graph Convolutional Networks for Agent-Initiated Social E-Commerce Recommendation. *Conference on Information and Knowledge Management (CIKM)*, 2019.

12. **Fengli Xu**, Zhenyu Han, Jinhua Piao, Yong 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. Hancheng Cao, Zhilong Chen, **Fengli Xu**, Yong Li, Vassilis 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**, Zhen Tu, Hongjia Huang, Shuhao Chang, Funing Sun, Diansheng Guo, Yong Li. No More than What I Post: Preventing Linkage Attacks on Check-in Services. *The Web Conference (WWW)*, 2019.

9. Tong Xia, Yue Yu, **Fengli Xu**, Funing Sun, Diansheng Guo, Depeng Jin, Yong Li. Understanding Urban Dynamics via State-sharing Hidden Markov Model. *The Web Conference (WWW)*, 2019.

8. **Fengli Xu**, Tong Xia, Hancheng Cao, Yong Li, Funing Sun, Fanchao 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**, Guozhen Zhang, Jiaxin Huang, Yong Li, Diyi Yang, Ben Y. Zhao, Fanchao Meng. Understanding Motivations behind Inaccurate Check-ins. *ACM on Human-Computer Interaction (CSCW)*, 2.CSCW (2018): 1-22.

6. Donghan Yu, Yong Li, **Fengli Xu**, Pengyu Zhang, Vassilis 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**, Zhen Tu, Yong Li, Pengyu Zhang, Xiaoming Fu, Depeng Jin. Trajectory Recovery From Ash: User Privacy Is NOT Preserved in Aggregated Mobility Data. *International Conference on World Wide Web (WWW)*, 2017.

4. Zhen Tu, Kai Zhao, **Fengli Xu**, Yong Li, Li Su, Depeng Jin. Beyond k-anonymity: protect your trajectory from semantic attack. *IEEE International Conference on Sensing, Communication, and Networking (SECON)*, 2017.

3. Jiaxin Huang, **Fengli Xu**, Yujun Lin, Yong 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**, Jie Feng, Pengyu Zhang, Yong Li. Context-aware Real-time Population Estimation for Metropolis. *ACM International Joint Conference on Pervasive and Ubiquitous Computing (UBICOMP)*, 2016.

1. Mingyang Zhang, **Fengli Xu**, Yong 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:

The Web Conference(WWW), 2021, 2022.
AAAI Conference on Artificial Intelligence(AAAI), 2021, 2022.
International Joint Conference on Artificial Intelligence(IJCAI), 2020, 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, 2018, 2019, 2020.
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:

ACM Transactions on Intelligent Systems and Technology, 2021.
IEEE Transactions on Network and Service Management, 2018, 2019, 2020.
IEEE Transactions on Mobile Computing, 2017, 2019.
IEEE Communications Magazine, 2017.
IEEE Transactions on Services Computing, 2017.