Lingfei Wu

CONTACT INFORMATION

School of Computing and Information
The University of Pittsburgh
Pittsburgh, PA 15260, USA

Mobile: (480) 435-2217
E-mail: wlf850927@gmail.com
Homepage: lingfeiwu.github.io

RESEARCH INTERESTS

My current research focus is on the *Science of Team Science and Innovation*, a new interdisciplinary field that aims to understand how science and technology can achieve breakthroughs by team collaboration, leveraging big data, complexity sciences, and artificial intelligence.

ACADEMIC POSITIONS

The University of Pittsburgh
Assistant Professor, School of Computing and Information, 2019–*present*
The University of Chicago
Postdoctoral Fellow, Department of Sociology, 2016–2019
Arizona State University
Postdoctoral Researcher, Global Biosocial Complexity Initiative, 2014–2015

EDUCATION

City University of Hong Kong	Communication	Ph.D., 2013
Peking University	Communication	M.A., 2009
China University of Political Science and Law	Political Science	B. A., 2006

REPRESENTATIVE RESEARCH PUBLICATIONS

- **Wu, L.**, Wang, D., & Evans, J. A. (2019). Large teams develop and small teams disrupt science and technology. ***Nature***, 566(7744), 378-382.
- Xu, F., Wu, L., & Evans, J. (2022). Flat Teams Drive Scientific Innovation. ***Proceedings of the National Academy of Sciences (PNAS)***, 119(23), e2200927119.

The New York Times Can Big Science Be Too Big?
The Atlantic Small Teams of Scientists Have Fresher Ideas
Forbes It Takes More Than Members to Make a Team
Harvard Business Review When Small Teams Are Better Than Big Ones

- Börner, K., Scrivner, O., Gallant, M., Ma, S., Liu, X., Chewning, K., **Wu, L.**, Evans, J. A. (2018). Skill discrepancies between research, education, and jobs reveal the critical need to supply soft skills for the data economy. ***Proceedings of the National Academy of Sciences (PNAS)***, 115(50), 12630-12637.

The Conversation How to fix the gap between school and work in South Africa
Complexity Science In an Age of Workplace Automation, Being Human Matters
Open Science Learning as Part of a Community Is a Powerful Skill

- **Wu, L.**, & Zhang, J. (2011). Accelerating growth and size-dependent distribution of human online activities. ***Physical Review E***, 84(2), 026113.
- **Wu, L.** (2011), The accelerating growth of online tagging systems. ***European Physical Journal B***, 83(2), 283.

New Scientist Why Social Networks Are Sucking up More of Your Time
Science Daily Online Activity Grows in a Similar Pattern to Real-Life Networks
Springer Select Predicting Collective Online Behavior

GRANTS

PI, "Understanding Team Age Dynamics and Scientific Innovation", Alfred P. Sloan Foundation, $250k, 2023–2026 (tentative).

PI, "Sideline to Frontline: Data-driven Technologies to Reskill Displaced Workers for Healthcare Economy and Beyond", Richard King Mellon Foundation, $100k, 2020–2021.

Co-PI, "Quantifying Hyperlocal Digital Disadvantage: A Path to Supporting Digital Participation", NSF RAPID, $196,271, 2020–2023.

PI, "Measuring Worldviews: A Map of Stubborn Social Skills", Institute for Cyber Law, Policy, and Security, University of Pittsburgh, $6500, 2020-2021.

PI, "International Symposium on Complex Systems, Geometry, and Machine Learning", Kaifeng Foundation, $442,930, 2016–2026.

PI, "International Symposium on Artificial Intelligence and Public Policy", Tencent Research Institute, $43,700, 2018–2019.

Senior personnel, "Collaborative Research: Understanding Team Success and Failure", National Science Foundation (NSF) Award #1829344, $592,772, 2018–2021.

Senior personnel, "Understanding Online Attention and User-generated Content Creation", Australian Research Council (ARC) Discovery Grant #140103688, $225,000, 2014–2016.

AWARDS

Oxford Martin Fellowship, University of Oxford, 2021
Top 100 most-discussed papers across all sciences, Altmetric, 2019
Economic Graph Research Award, LinkedIn, 2016

BOOK

Wu, L. (2014). *Data Visualization*, https://lingfeiwu1.gitbooks.io/data-mining-in-social-science/

UNDER REVIEW

Lin, Y., Frey, C. B., & **Wu, L.** (2022). Remote Collaboration Fuses Fewer Breakthrough Ideas. arXiv preprint arXiv:2206.01878. ***Nature***.

Cui, H., **Wu, L.**, & Evans, J. A. (2022). Aging Scientists and Slowed Advance. arXiv preprint arXiv:2202.04044. ***Nature Communication***.

Tong, D., Wu, L., & Evans, J. A. (2021). Low-skilled Occupations Face the Highest Re-skilling Pressure. arXiv preprint arXiv:2101.11505. ***PNAS***.

IN PREPARATION

Risha, Z., Lin, Y., Leahey, E., & Wu, L. The Productivity Cost of Convergence Science.

Chen, M., Neffke, F., & Wu, L. The Hard Challenge of Soft Knowledge.

Lin, Y. & Wu, L. Two kinds of Innovation in Science and Technology.

PUBLICATIONS (FULL LIST)

1. Xu, F., Wu, L., & Evans, J. (2022). Flat Teams Drive Scientific Innovation. *Forthcoming in* ***Proceedings of the National Academy of Sciences (PNAS)***
2. Wu, L., Kittur, A., Youn, H., Milojević, S., Leahey, E., Fiore, S. M., & Ahn, Y. Y. (2022). Metrics and Mechanisms: Measuring the Unmeasurable in the Science of Science. ***Journal of Informetrics,*** 16(2), 101290.
3. Lin, Y., Evans, J. A., & Wu, L. (2022). New directions in science emerge from disconnection and discord. ***Journal of Informetrics***, 16(1), 101234.
4. Li, L., Wu, L., & Evans, J. A. (2020). Social centralization and semantic collapse: Hyperbolic embeddings of networks and text. ***Poetics***, 101428.
5. Xu, H., Zhang, Z., Wu, L., & Wang, C. J. (2019). The Cinderella Complex: Word embeddings reveal gender stereotypes in movies and books. ***PLOS ONE***, 14(11).
6. Wu, L., Wang, D., & Evans, J. A. (2019). Large teams develop and small teams disrupt science and technology. ***Nature***, 566(7744), 378-382.
7. Börner, K., Scrivner, O., Gallant, M., Ma, S., Liu, X., Chewning, K., Wu, L., Evans, J. A. (2018). Skill discrepancies between research, education, and jobs reveal the critical need to supply soft skills for the data economy. ***Proceedings of the National Academy of Sciences (PNAS)***, 115(50), 12630-12637.
8. Wu, L., & Wang, C. J. (2016). Tracing the attention of moving citizens. ***Scientific Reports***, 6, 33103.
9. Wang, C. J., Wu, L., Zhang, J., & Janssen, M. A. (2016). The collective direction of attention diffusion. ***Scientific Reports***, 6, 34059.
10. Wang, C. J., & Wu, L. (2016). The scaling of attention networks. ***Physica A: Statistical Mechanics and its Applications***, 448, 196-204.
11. Wu, L., Baggio, J. A., & Janssen, M. A. (2016). The role of diverse strategies in sustainable knowledge production. ***PLOS ONE***, 11(3), e0149151.
12. Zhang, J., Li, X., Wang, X., Wang, W. X., & Wu, L. (2015). Scaling behaviours in the growth of networked systems and their geometric origins. ***Scientific reports***, 5, 9767.
13. Li, X., Wang, X., Zhang, J., & Wu, L. (2015). Allometric scaling, size distribution and pattern formation of natural cities. ***Palgrave Communications***, 1, 15017.
14. Wu, L., Zhang, J., & Zhao, M. (2014). The metabolism and growth of Web forums. ***PLOS ONE***, 9(8), e102646.
15. Wu, L., & Ackland, R. (2014). How Web 1.0 fails: The mismatch between hyperlinks and clickstreams. ***Social Network Analysis and Mining***, 4(1), 202.
16. Zhang J. and Wu, L. (2013), Allometry and dissipation of ecological networks. ***PLOS ONE***, 8(9), e72525.
17. Wu, L. and Zhang, J. (2013), The decentralized structure of collective attention on the Web. ***European Physical Journal B***, 86(6), 266.

18. **Wu, L.**, & Zhang, J. (2011). Accelerating growth and size-dependent distribution of human online activities. ***Physical Review E***, 84(2), 026113.
19. **Wu, L.** (2011), The accelerating growth of online tagging systems. ***European Physical Journal B***, 83(2), 283.
20. Wu, L., Cai, Y., and Liu, D. (2011), Online shopping among Chinese consumers: An exploratory investigation of demographics and value orientation. ***International Journal of Consumer Studies***, 35(4), 458.

TEACHING

- **Data Visualization**
  Information Visualization (INSCI2415), The Master of Science in Information Science program, University of Pittsburgh, 2019–present

- **Computational Social Science**
  AI for Team Science and Innovation (INFSCI 3350), Doctoral Seminar, University of Pittsburgh, 2020–present
  Computational Communication Seminar, Nanjing University. 2015
  Complex Network Analysis Seminar, Arizona State University. 2014

TALKS

Research Institutions | Government Agencies
National Bureau of Economic Research (NBER), DC, 2022
Zhejiang University, Department of Sociology. 2022.
Peking University, Department of Information Management. 2022.
Monash University, Department of Economics. 2021.
UT Austin, School of Information. 2021.
CMU, Societal Computing program. 2021.
MIT Sloan, Future of Work program. 2021.
Wuhan University, School of Information Management. 2021.
CMU, Social Cybersecurity Working Group, 2020
UC Davis, Computational Communication Research Lab, 2020
Harvard Kennedy School, Center for International Development. 2018
National Opinion Research Center (NORC). 2018.
National Natural Science Foundation of China (NSFC). 2018.
Nanyang Tech. University. School of Comm. and Information. 2011.
The Commonwealth Scientific and Industrial Research Organisation. 2011.
Australian National University, Demographic & Social Research Inst. 2011.
Wolfram Research. 2010.

Academic Conferences
Int. Conf on the Science of Science and Innovation (ICSSI), DC, 2022
Int. Conf on Computational Social Science (IC2S2). 2015, 2018, 2020, 2021
Network Science Society Annual Conference (NetSci). 2012, 2017, 2019
Science of Team Science Conference (SciTS). 2017, 2018
Chinese National Conference on Social Media Processing (SMP), 2016, 2018
Int. Conf on Social Informatics (SocInfo). 2014.
Int. Conf on the Simulation and Synthesis of Living Systems (ALIFE), 2012
International Communication Association Conference (ICA). 2012.
Agricultural and Applied Economics Association Conference (AAEA). 2009.
ACM Web Science Conference. 2009.

Media coverage

SAGE Research Methods Ask a Researcher: Lingfei Wu on Networks and Computational Social Science
SAGE Big Data & Data Visualization in the Study of the Science of Science
The New York Times Can Big Science Be Too Big?
The Atlantic Small Teams of Scientists Have Fresher Ideas
Forbes It Takes More Than Members to Make a Team
Harvard Business Review When Small Teams Are Better Than Big Ones
New Scientist Why Social Networks Are Sucking up More of Your Time
Science Daily Online Activity Grows in a Similar Pattern to Real-Life Networks
Springer Select Predicting Collective Online Behavior
The Conversation How to fix the gap between school and work in South Africa
Complexity Science In an Age of Workplace Automation, Being Human Matters
Open Science Learning as Part of a Community Is a Powerful Skill

Service

Conference/Workshop Co-Chair/Organizer
International Conference on Computational Social Science (IC2S2) 2022
International Science of Team Science Conference (SciTS) 2022
Network Science Society Annual Conference (NetSci) 2017, 2019, 2021, 2022
The Web Conference (WWW) 2020
Duke Forest Conference 2016
Conference on Complex Systems (CCS) 2015

Invited Reviewer for Academic Journals
Scientometrics
Quantitative Science Studies (QSS)
Journal of the Association for Information Science and Technology (JASIST)
Physica A: Statistical Mechanics and its Applications
PLOS ONE

Research Evaluation Consultant for Private Funding Agencies
Novo Nordisk Fonden
John Templeton Foundation

Invited Reviewer for Federal Funding Agencies
National Science Foundation
U.S. Department of Energy

Mentoring & Advising

PhD Mentees
Yiling Lin, Information Science, University of Pittsburgh, 2021–*present*

PhD Dissertation Advising
Zak Risha, Information Science, University of Pittsburgh, estimated 2023
Rongqian Ma, Library and Information Science, University of Pittsburgh, 2022
Assistant Professor, Indiana University Bloomington
Linzhuo Li, Sociology, The University of Chicago, 2020
Assistant Professor, Zhejiang University
Chengjun Wang, Communication, City University of Hong Kong, 2014
Associate Professor, Nanjing University

Master Thesis Advising

Masters in Computational Social Science, The University of Chicago

Yiling Lin, 2021 *PhD student, University of Pittsburgh*

Di Tong, 2020 *PhD student, Massachusetts Institute of Technology*

Yuanhao Liu, 2019 *PhD student, Northwestern University*

Masters in Communication, Nanjing University

Huiming Xu, 2021 *PhD student, The University of Texas at Austin*

SKILLS

Python, R, Mathematica, STATA, IBM SPSS, SQL, Adobe Illustrator, Processing