Lingfei Wu

CONTACT INFORMATION

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

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RESEARCH INTERESTS

My current research focuses on the *Science of Team Science and Innovation*, a new interdisciplinary field that leverages big data, complexity sciences, and artificial intelligence to understand how science and technology can advance through team collaboration.

ACADEMIC POSITIONS

The University of Pittsburgh
   Assistant Professor, School of Computing and Information, 2019–*present*
The University of Chicago
   Postdoctoral Fellow, Department of Sociology, 2016–19
Arizona State University | Santa Fe Institute
   Postdoctoral Researcher, ASU-SFI Center for Biosocial Complex Systems, 2014–15

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

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

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. *Proceedings of the National Academy of Sciences (PNAS)*, 119(23), e2200927119.
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 & VISITS

Research Institutions | Government Agencies | Think Tanks | Art Museums
National Bureau of Economic Research (NBER), DC, 2022
Zhejiang University, Department of Sociology, 2022
Wuhan University, School of Information Management, 2021, 2022
Monash University, Department of Economics, 2021
The University of Texas at Austin, School of Information, 2021
Carnegie Mellon University, Institute for Software Research, 2020, 2021
MIT Sloan, Future of Work Program, 2021
Peking University, The Office of Scientific Research, 2021
UC Davis, Computational Communication Research Lab, 2020
Pew Research Center, 2019
Harvard Kennedy School, Center for International Development. 2018
National Opinion Research Center (NORC), 2018
Tencent Research Institute, 2018, 2019
National Natural Science Foundation of China (NSFC), 2018
Nanjing University, School of Journalism & Communication, 2017, 2018, 2019
GESIS Leibniz Institute for the Social Sciences, 2016
Volkswagen Foundation, 2016
Santa Fe Institute, 2015
Arizona State University, Global Biosocial Complexity Initiative, 2014
C5ART Institute, 2013
Swarma Club, 2013, 2014, 2015
Baidu Inc., Department of Personal Recommendation, 2012
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

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

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

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

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

Mentoring & Advising

Ph.D. Mentees
Yiling Lin, Information Science, University of Pittsburgh, 2021–*present*

Ph.D. 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   *Ph.D. student, University of Pittsburgh*
    Di Tong, 2020   *Ph.D. student, Massachusetts Institute of Technology*
    Yuanhao Liu, 2019   *Ph.D. student, Northwestern University*
Masters in Communication, Nanjing University
    Huiming Xu, 2021   *Ph.D. student, The University of Texas at Austin*

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