

LINGFEI WU

School of Computing and Information, University of Pittsburgh
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Academic Positions

University of Pittsburgh, School of Computing and Information

Assistant Professor, Information Science 2019 - Present

University of Chicago, Department of Sociology

Postdoctoral Scholar, Knowledge Lab 2016 - 2018

Arizona State University & Santa Fe Institute

Postdoctoral Scholar, ASU-SFI Center for Biosocial Complex Systems 2014 - 2015

Industrial Positions

Senior Research Consultant, Tencent Research Institute

2018 - 2019

Machine Learning Engineer, Baidu, Inc.

2013 - 2014

Education

Ph.D. in Communication, City University of Hong Kong

2013

M.A. in Communication, Peking University

2009

B.A. in Political Science, China University of Political Science and Law

2006

Research Interests

Computational Social Science, Science of Science, Team Science and Innovation

Selected Publications ([†] mentored student or postdoc)

Lin, Y.[†], Frey, C. B., & Wu, L. (forthcoming). Remote Collaboration Fuses Fewer Breakthrough Ideas. *Nature*

Xu, F.[†], Wu, L., & Evans, J. (2022). Flat teams drive scientific innovation. *Proceedings of the National Academy of Sciences*

Wu, L., Wang, D., & Evans, J. A. (2019). Large teams develop and small teams disrupt science and technology. *Nature*

Media Coverage: The New York Times, The Atlantic, Forbes, Harvard Business Review

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*

Media Coverage: The Conversation, Complexity Science, Open Science

Grants

- **National Science Foundation CAREER Award: Science of Science**

PI, “How Does Core Scientific Knowledge Advance? Understanding Team Innovation at the Foundations of Sciences.” \$565,087

2023 - 2028

- **Alfred P. Sloan Foundation: Economics Program**

PI, “Disappearing Mentorship: How Funding Shifts PIs from Mentors to Managers in Scientific Teams.” \$250,000

In progress

- **Richard King Mellon Foundation**
PI, “Sideline to Frontline: Data-driven Technologies to Reskill Displaced Workers for Healthcare Economy and Beyond.” \$100,00 2020 - 2021
- **National Science Foundation: Information & Intelligent Systems**
Co-PI, “Quantifying Hyperlocal Digital Disadvantage: A Path to Supporting Digital Participation.” \$196,271 2020 - 2023
- **Kaifeng Foundation: Complexity Science Program**
PI, “Complex Systems, Geometry, and Machine Learning Workshops.” \$442,930 2016 - 2026
- **Pitt Institute for Cyber Law, Policy, and Security**
PI, “Measuring Worldviews: A Map of Stubborn Social Skills.” \$6,500 2020 - 2021
- **Tencent Research Institute: Computational Social Science Program**
PI, “Tencent & Tsinghua AI and Public Policy Workshops.” \$43,700 2018 - 2019
- **National Science Foundation: Social, Behavioral and Economic Sciences**
Senior personnel, “Understanding Team Success and Failure.” \$592,772 2018 – 2021
- **Australian Research Council: Discovery Program**
Senior personnel, “Understanding Online Attention and User-generated Content Creation.” \$225,000 2014 - 2016

Awards & Honors

- CAREER Award, *National Science Foundation* 2023
- Oxford Martin Fellowship, *University of Oxford* 2021
- Top 100 most-discussed papers across all sciences, *Altmetric* 2019
- Best Student Paper Award, *Chinese Association for Journalism and Communication* 2009
- Student Travel Award, *Agricultural and Applied Economics Association Conference* 2009
- P&G Best Student Paper Award, *China Marketing Research Association* 2008
- China National Petroleum Corporation Scholarship, *Peking University* 2006
- National Scholarship, *Chinese Ministry of Education* 2002

Selected Teaching Experiences

- **Information Visualization**
Lecturer, for B.S. and M.S. in Information Science, University of Pittsburgh 2019 - Present
- **Data Mining**
Lecturer, for M.S. and Ph.D. in Information Science, University of Pittsburgh 2021 - Present
Guest Lecturer, for M.S. in Complex Systems Science, Arizona State University 2014 - 2015
- **Communication Research Methods**
Guest Lecturer, for Ph.D. in Media and Communication, Nanjing University 2016 - 2018
Teaching Assistant, for Ph.D. in Communication, City University of Hong Kong 2012 - 2013

Publications (Full List) († mentored student or postdoc)

1. Lin, Y.[†], Frey, C. B., & **Wu, L.** (forthcoming). Remote Collaboration Fuses Fewer Breakthrough Ideas. *Nature*
2. Xu, F.[†], **Wu, L.**, & Evans, J. (2022). Flat Teams Drive Scientific Innovation. *Proceedings of the National Academy of Sciences*
3. **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*
4. Lin, Y.[†], Evans, J. A., & **Wu, L.** (2022). New directions in science emerge from disconnection and discord. *Journal of Informetrics*
5. Li, L., **Wu, L.**, & Evans, J. A. (2020). Social centralization and semantic collapse: Hyperbolic embeddings of networks and text. *Poetics*
6. Xu, H.[†], Zhang, Z., **Wu, L.**, & Wang, C. J. (2019). The Cinderella Complex: Word embeddings reveal gender stereotypes in movies and books. *PLOS One*
7. **Wu, L.**, Wang, D., & Evans, J. A. (2019). Large teams develop and small teams disrupt science and technology. *Nature*
8. Börner, K., Scrivner, O., Gallant, M., Ma, S., Liu, X., Chewing, 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.
9. **Wu, L.**, & Wang, C. J. (2016). Tracing the attention of moving citizens. *Scientific Reports*
10. Wang, C. J., **Wu, L.**, Zhang, J., & Janssen, M. A. (2016). The collective direction of attention diffusion. *Scientific Reports*
11. Wang, C. J., & **Wu, L.** (2016). The scaling of attention networks. *Physica A: Statistical Mechanics and its Applications*
12. **Wu, L.**, Baggio, J. A., & Janssen, M. A. (2016). The role of diverse strategies in sustainable knowledge production. *PLOS One*
13. 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*
14. Li, X., Wang, X., Zhang, J., & **Wu, L.** (2015). Allometric scaling, size distribution and pattern formation of natural cities. *Palgrave Communications*
15. **Wu, L.**, Zhang, J., & Zhao, M. (2014). The metabolism and growth of web forums. *PLOS One*
16. **Wu, L.**, & Ackland, R. (2014). How Web 1.0 fails: The mismatch between hyperlinks and clickstreams. *Social Network Analysis and Mining*
17. Zhang J. and **Wu, L.** (2013). Allometry and dissipation of ecological networks. *PLOS One*

18. **Wu, L.** & Zhang, J. (2013), The decentralized flow structure of clickstreams on the web. *European Physical Journal B*
19. **Wu, L.,** & Zhang, J. (2011). Accelerating growth and size-dependent distribution of human online activities. *Physical Review E*
20. **Wu, L.** (2011), The accelerating growth of online tagging systems. *European Physical Journal B*
21. **Wu, L.,** Cai, Y., & Liu, D. (2011), Online shopping among Chinese consumers: An exploratory investigation of demographics and value orientation. *International Journal of Consumer Studies*

Books

22. **Wu, L.** (2014). Data Mining in Social Science. eBook.

Python Package

Wu, L., & Wang, C. J. (2016). **scholarNetwork**

This *Python* package is designed to assist researchers in web-scraping, analyzing, and visualizing collaboration networks based on Google Scholar data. It is built upon *BeautifulSoup* and *NetworkX* and integrated into pip, the standard tool for installing Python packages.

Reference manual: <https://pypi.org/project/scholarNetwork/>

Invited Talks and Visits

National Bureau of Economic Research, 2022, 2023
 Santa Fe Institute, 2015, 2023
 Northwestern University, Kellogg School of Management, 2018, 2022, 2023
 Carnegie Mellon University, Institute for Software Research, 2020, 2021, 2022, 2023
 Tsinghua University, Department of Computer Science and Technology, 2018, 2023
 University of California, Irvine, Paul Merage School of Business, 2023
 Complexity Science Hub Vienna, Austria, 2022
 Monash University, Department of Economics, 2021
 University of Texas at Austin, School of Information, 2021
 Peking University, The Office of Scientific Research, 2021
 UC Davis, Computational Communication Research Lab, 2020
 Michigan State University, Department of Communication, 2020
 Pew Research Center, 2019
 Harvard Kennedy School, The Growth Lab. 2018
 Kaifeng Foundation, 2018
 National Opinion Research Center, 2018
 Tencent Research Institute, 2018, 2019
 National Natural Science Foundation of China, 2018
 Nanjing University, School of Journalism & Communication, 2017, 2018, 2019
 GESIS Leibniz Institute for the Social Sciences, 2016
 Volkswagen Foundation, 2016
 Nanyang Technological University, School of Communication and Information, 2011
 The Commonwealth Scientific and Industrial Research Organisation, Australia, 2011
 Australian National University, Demographic & Social Research Inst, 2011
 Wolfram Research, 2010

Service

Grant Reviewer & Consultant

National Science Foundation | U.S. Department of Energy | Novo Nordisk Fonden | John Templeton Foundation

Journal Reviewer

American Journal of Sociology | *Nature Human Behavior* | *Scientific Reports* | *PLOS One* | *EPJ Data Science* | *Journal of the Association for Information Science and Technology* | *Quantitative Science Studies* | *Scientometrics* | *Physica A*

Conference Reviewer & Organizer

International Conference on Computational Social Science (IC2S2) | International Society for Scientometrics and Informetrics (ISSI) | International Science of Team Science Conference (SciTS) | Network Science Society Annual Conference (NetSci) | The Web Conference (WWW) | Duke Forest Conference | Conference on Complex Systems (CCS)

Mentorship & Advising

Ph.D. Students

Yiling Lin (ongoing)

Zak Risha (joint with Erin Walker University of Pittsburgh)

Postdocs or Research Assistants

Haochuan Cui (Postdoc, ongoing)

Fengli Xu (Postdoc joint with James Evans University of Chicago,

Faculty job placement: Tsinghua University, Dept. of Electrical Engineering)

Rongqian Ma (RA, Faculty job placement: IU Bloomington, Dept. of Information and Library Science)

Linzhuo Li (RA, Faculty job placement: Zhejiang University, Dept. of Sociology)

Di Tong (RA, PhD program placement: MIT, Sloan School of Management)

Huimin Xu (RA, PhD program placement: UT Austin, School of Information)

Selected Media Coverage

China Science Daily Fresh Team Members for New Ideas

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

Computer Skills

- Proficient in Python, R, Mathematica, MATLAB, STATA, SPSS, SQL, Adobe Illustrator, Processing
- Familiar with C/C++, Java, JavaScript, Gephi, Linux, SPSS Amos, HLM