Junming Huang

Contact Information

363 Wallace Hall
Princeton, NJ 08544
United States

✉ pub@junminghuang.com
junminghuang.com
Google Scholar

Research Highlights

Science of science

- Explain gender inequality in academic [7]
  Empirical evidence suggests significant gender differences in the total productivity and impact of academic careers across science, technology, engineering, and mathematics (STEM) fields. Paradoxically, the increase in the number of women academics over the past 60 years has increased these gender differences. Yet, we find that men and women publish a comparable number of papers per year and have equivalent career-wise impact for the same total number of publications. This suggests the productivity and impact of gender differences are explained by different publishing career lengths and dropout rates. This comprehensive picture of gender inequality in academic publishing can help rephrase the conversation around the sustainability of women's careers in academia, with important consequences for institutions and policy makers.
  Selected media: Nature Index, Nature Review Physics, Inside Higher Ed, PNAS Commentary
- Reverse brain drain [2]
  Our study reveals the widespread fear among scientists of Chinese descent in the United States arising from conducting routine research and academic activities. If this fear is not alleviated, there are significant risks of underutilization of scientific talent as well as losing scientific talent to China and other countries. Addressing the fear of US-based scientists of Chinese descent and making the American academic environment welcoming and attractive to all will help retain and attract scientific talent and strengthen the US global leadership in science and technology in the long run.
  Selected media: Wall Street Journal, Inside Higher Ed, Foreign Policy, Foreign Affairs, Scientific American, Asahi Shimbun

Human opinions and peer influence

- Identifying peer influence with Bayesian network [25]
  We work on confirming and quantifying the social influence how people's choices are affected by peer opinions on online social networks. To detect the potential influence while ruling out alternative factors such as homophily, we construct two Bayesian networks respectively representing correlation and causation between ego behavior and friend opinion, and examine whether and how those two Bayesian networks agree with observed data. With statistics hypothesis tests, we inspect the conditional independence relations characterizing those Bayesian networks, on two datasets of 800,000 online users who share with friends their ratings to millions of books and movies. The empirical results confirm that a friend's positive opinion on a book or movie increases a user's preference on it, and quantify the causation as social influence which is strongly related with people having high degree in network and good taste in content.
- Temporal scaling of peer influence [19]
  With statistics analysis and modeling we uncover the temporal scaling of evolving social influence on online social networks. We reveal the dynamic nature of social influence by observing power-law distributed idle latency of absence of interactions between two individuals, against the traditional assumption of static influence which leads to an exponential distribution of latency. We aim at how the latency decreases the successful rate of information propagation. Inspecting retweet behaviors among 500,000 users on a Twitter-like website, we find that the social influence decays in a power-law manner. That finding inspires a quantita-

tive model that predicts information propagation with error rate reduced by half compared with mainstream models.

Academic Positions

Center on Contemporary China, **Princeton University**, Princeton, NJ, United States

- Associate Research Scientist — 2020–present
- Postdoctoral Research Associate — 2018–2020

Center for Complex Network Research, **Northeastern University**, Boston, MA, United States

- Postdoctoral Research Associate — 2016-2018
- Visiting Scholar — 2015-2016

University of Electronic Science and Technology of China, Chengdu, China

- Assistant Researcher — 2014–2019

Education

PhD, Computer Science and Technology, University of Chinese Academy of Sciences, 2014

Thesis: Research on Influence In Social Recommendations
Advisor: Guojie Li and Xue-Qi Cheng

Bachelor of Science, Physics, Tsinghua University, 2007

Publications

[1] Donghui Wang, Yu Xie, and **Junming Huang**. "Trend Analysis with Pooled Data from Different Survey Series: The Latent Attitude Method". In: *Sociological Methodology* 54.1 (2024), pp. 118–141. DOI: 10.1177/00811750231193641.

[2] Yu Xie, Xihong Lin, Ju Li, Qian He, and **Junming Huang**. "Caught in the crossfire: Fears of Chinese-American scientists". In: *Proceedings of the National Academy of Sciences* 120.27 (2023), e2216248120. DOI: 10.1073/pnas.2216248120.

[3] Xiu-Xiu Zhan, Kaiyue Zhang, Lun Ge, **Junming Huang**, Zinan Zhang, Lu Wei, Gui-Quan Sun, Chuang Liu, and Zi-Ke Zhang. "Exploring the effect of social media and spatial characteristics during the COVID-19 pandemic in China". In: *IEEE Transactions on Network Science and Engineering* 10.1 (2023), pp. 553–564. DOI: 10.1109/TNSE.2022.3217419.

[4] **Junming Huang**, Gavin G. Cook, and Yu Xie. "Between reality and perception: the mediating effects of mass media on public opinion toward China". In: *Chinese Sociological Review* 53.5 (2021), pp. 431–450. DOI: 10.1080/21620555.2021.1980720.

[5] **Junming Huang**, Gavin G. Cook, and Yu Xie. "Large-scale quantitative evidence of media impact on public opinion toward China". In: *Humanities & Social Sciences Communications* 8.181 (2021). DOI: 10.1057/s41599-021-00846-2.

[6] Linlin Liu, Jianfei Yu, **Junming Huang**, Feng Xia, and Tao Jia. "The dominance of big teams in China's scientific output". In: *Quantitative Science Studies* 2.1 (Apr. 2021), pp. 350–362. ISSN: 2641-3337. DOI: 10.1162/qss_a_00099.

[7] **Junming Huang**, Alexander J. Gates, Roberta Sinatra, and Albert-László Barabási. "Historical comparison of gender inequality in scientific careers across countries and disciplines". In: *Proceedings of the National Academy of Sciences* 117.9 (2020), pp. 4609–4616. DOI: 10.1073/pnas.1914221117.

[8] Peng Bao, Hua-Wei Shen, **Junming Huang**, and Haiqiang Chen. "Mention effect in information diffusion on a micro-blogging network". In: *PLOS ONE* 13.3 (2018), pp. 1–13. DOI: 10.1371/journal.pone.0194192.

[9] Chao Fan, **Junming Huang**, Zhihai Rong, and Tao Zhou. "Coupling diversity across human behavior spaces". In: *Europhysics Letters* 124.4 (2018), p. 48001. DOI: 10.1209/0295-5075/124/48001.

[10] Burcu Yucesoy, Xindi Wang, **Junming Huang**, and Albert-László Barabási. "Success in books: a big data approach to bestsellers". In: *EPJ Data Science* 7.7 (2018), pp. 1–25. ISSN: 2193-1127. DOI: 10.1140/epjds/s13688-018-0135-y.

[11] Chao Fan, Yiding Liu, **Junming Huang**, Zhihai Rong, and Tao Zhou. "Correlation between social proximity and mobility similarity". In: *Sci. Rep.* 7 (2017). DOI: 10.1038/s41598-017-12274-x.

[12] Tong Man, Huawei Shen, **Junming Huang**, and Xue-Qi Cheng. "SCMF: A Matrix Factorization Model With Soft". In: *Journal of Chinese Information Processing* 31.4, 174 (2017), p. 174. URL: http://jcip.cipsc.org.cn/EN/abstract/article_2430.shtml.

[13] Lu Yu, **Junming Huang**, Ge Zhou, Chuang Liu, and Zi-Ke Zhang. "TIIREC: A tensor approach for tag-driven item recommendation with sparse user generated content". In: *Information Sciences* 411 (2017), pp. 122–135. ISSN: 0020-0255. DOI: https://doi.org/10.1016/j.ins.2017.05.025.

[14] **Junming Huang**, Huawei Shen, and Xue-Qi Cheng. "Understanding Information Propagations via Influence Backbone Analysis on Social Networks". In: 30.2, 74 (2016), p. 74. URL: http://jcip.cipsc.org.cn/CN/Y2016/V30/I2/74.

[15] Keith Burghardt, Christopher Verzijl, **Junming Huang**, Matthew Ingram, Binyang Song, and Marie-Pierre Hasne. "Testing Modeling Assumptions in the West Africa Ebola Outbreak". In: *Scientific Reports* 6 (2016). DOI: 10.1038/srep34598.

[16] Chao Li, Tao Zhou, **Junming Huang**, Xue-Qi Cheng, and Shen Hua-Wei. "Transfer with Shared Users: A Cross-platform". In: *Journal of Chinese Information Processing* 30.2 (2016), pp. 90–98. URL: http://jcip.cipsc.org.cn/EN/Y2016/V30/I2/90.

[17] Lu Yu, Ge Zhou, Chuxu Zhang, **Junming Huang**, Chuang Liu, and Zi-Ke Zhang. "RankMBPR: Rank-aware mutual bayesian personalized ranking for item recommendation". In: *Web-Age Information Management: 17th International Conference, WAIM 2016, Nanchang, China, June 3-5, 2016, Proceedings, Part I 17*. Springer. 2016, pp. 244–256. ISBN: 978-3-319-39937-9. DOI: 10.1007/978-3-319-39937-9_19.

[18] Tong Man, Huawei Shen, **Junming Huang**, and Xueqi Cheng. "Context-Adaptive Matrix Factorization for Multi-Context Recommendation". In: *Proceedings of the 24th ACM International on Conference on Information and Knowledge Management*. CIKM '15. Melbourne, Australia: ACM, 2015, pp. 901–910. ISBN: 978-1-4503-3794-6. DOI: 10.1145/2806416.2806503.

[19] **Junming Huang**, Chao Li, Wen-Qiang Wang, Hua-Wei Shen, Guojie Li, and Xue-Qi Cheng. "Temporal scaling in information propagation". In: *Sci. Rep.* 4 (2014). DOI: 10.1038/srep05334.

[20] Suqi Cheng, Huawei Shen, **Junming Huang**, Wei Chen, and Xueqi Cheng. "IMRank: Influence Maximization via Finding Self-consistent Ranking". In: *Proceedings of the 37th International ACM SIGIR Conference on Research & Development in Information Retrieval*. SIGIR '14. 2014, pp. 475–484. DOI: 10.1145/2600428.2609592.

[21] Peng Bao, Hua-Wei Shen, **Junming Huang**, and Xue-Qi Cheng. "Popularity prediction in microblogging network: a case study on sina weibo". In: *Proceedings of the 22nd international conference on World Wide Web companion*. WWW'13 Companion. Rio de Janeiro, Brazil: Association for Computing Machinery, 2013, pp. 177–178. ISBN: 978-1-4503-2038-2. DOI: 10.1145/2487788.2487877.

[22] Suqi Cheng, Hua-Wei Shen, **Junming Huang**, and Xue-Qi Cheng. "StaticGreedy: solving the scalability-accuracy dilemma in influence maximization". In: *Proceedings of the 22nd ACM international conference on Information and knowledge management*. CIKM '13. San Francisco, California, USA: Association for Computing Machinery, 2013, pp. 509–518. ISBN: 9781450322638. DOI: 10.1145/2505515.2505541.

[23] Tong Man, Hua-Wei Shen, **Junming Huang**, and Xue-Qi Cheng. "SCMF: A Matrix Factorization Model With Soft Constraint for Multi-Source Heterogeneous Network". In: *The 9th Chinese Conference of Information Retrieval*. CCIR 2013. Taiyuan, China, 2013.

[24] Yu-Xiao Zhu, **Junming Huang**, Zi-Ke Zhang, Qian-Ming Zhang, Tao Zhou, and Yong-Yeol Ahn. "Geography and Similarity of Regional Cuisines in China". In: *PLoS ONE* 8.11 (Nov. 2013), e79161. DOI: 10.1371/journal.pone.0079161.

[25] **Junming Huang**, Xue-Qi Cheng, Hua-Wei Shen, Tao Zhou, and Xiaolong Jin. "Exploring social influence via posterior effect of word-of-mouth recommendations". In: *Proceedings of the fifth ACM international conference on Web search and data mining*. WSDM '12. 2012, pp. 573–582. DOI: 10.1145/2124295.2124365.

[26] Zhi-Dan Zhao, Shi-Min Cai, **Junming Huang**, Yan Fu, and Tao Zhou. "Scaling behavior of online human activity". In: *EPL (Europhysics Letters)* 100.4 (2012), p. 48004. URL: http://stacks.iop.org/0295-5075/100/i=4/a=48004.

[27] **Junming Huang**, Xue-Qi Cheng, Jiafeng Guo, Hua-Wei Shen, and Kun Yang. "Social Recommendation with Interpersonal Influence". In: *Proceedings of the 19th European Conference on Artificial Intelligence (ECAI 2010)*. Amsterdam, The Netherlands: IOS Press, 2010, pp. 601–606. ISBN: 978-1-60750-605-8. DOI: 10.3233/978-1-60750-606-5-601.

Teaching

Guest lecturer, Princeton University

SOC504 Advanced Social Statistics	Spring 2023
SOC504 Advanced Social Statistics	Spring 2021
SOC504 Advanced Social Statistics	Spring 2020
SOC504 Advanced Social Statistics	Spring 2019

Grants

Researcher, DARPA (N66001-16-1-4067) 2016–2017

Talks

Invited talks and lectures

- Parity & Equality Symposium in the academic world by Center for Research in Epidemiology and Statistics (CRESS) Mar 2023
- Carnegie Mellon University Jan 2023
- Chinese University of Hong Kong Jan 2023
- Nankai University Oct 2022
- Swarma Club online seminar Sep 2022
- Summer Institute in Computational Social Science, University of Pennsylvania Jun 2022
- Princeton Psychology forum Apr 2022
- Beijing University of Technology Sep 2021
- Nanjing University Dec 2020
- Socioeconomic networks and network science workshop Jul 2020
- Swarma Club online seminar Feb 2020
- Applied Statistics Workshop, Harvard University [video] Sep 2018
- The frontier forum of complex systems, Shaanxi Normal University, China Jun 2018
- Tsinghua University, China May 2018
- Beijing Normal University, China May 2018
- Beijing Jiaotong University, China May 2018
- Beihang University, China May 2018
- Chongqing University of Technology, China May 2018
- Southwest University, China May 2018
- Southwest Jiaotong University, China May 2018
- Xinghai Junior Scholar Forum, Dalian University of Technology, China May 2018

- Beijing University of Technology, China May 2018
- Institute of Science and Development, Chinese Academy of Sciences May 2018
- Nanjing University of Science and Technology, China May 2018
- Chinese Academy of Sciences Apr 2018
- Southwestern University of Finance and Economics, China Apr 2018
- Tongji University, China Apr 2018
- Hangzhou Normal University, China Apr 2018
- Information Sciences Institute, University of Southern California Jan 2018
- University of Massachusetts Amherst Oct 2017
- Channing Network Science Seminar, Harvard Medical School Jul 2017
- Knowledge Lab, University of Chicago Mar 2017
- Northwestern Institute on Complex Systems, Northwestern University Feb 2017
- Media Lab, Massachusetts Institute of Technology Sep 2017
- Clarivate Analytics Mid-Year meeting Aug 2017
- Workshop on Hacking the Web of Science data? From bibliometric projects to researcher portals, American Library Association Annual Conference & Exhibition, Chicago Jun 2017
- Workshop on Web of Science as a Research Dataset, Indiana University Nov 2016
- IBM T. J. Watson Research Center Aug 2016
- Channing Network Science Seminar, Harvard Medical School Sep 2015
- Northeastern University Dec 2014
- University of Electronic Science and Technology of China Nov 2014
- Sohu Inc., Beijing Jul 2014
- Institute of Computing Technology, Chinese Academy of Sciences, Beijing Jul 2012

Conference presentations

- Workshop on Quantifying Science, Conference on Complex Systems 2015 Sep 2015
- Fifth ACM International Conference on Web Search and Data Mining Feb 2012

Public (non-academic) audience

- Women in Physics by Consulate General of France [video] Mar 2021
- TEDx, Chengdu, China May 2018

Academic Service

Editorial services

- Guest editor, Special Issue on AI as Intelligent Technology and Agent to Understand and Be Understood by Human Mind, *Frontiers in Psychology* (2024)
- Guest editor, Special Issue on Big Data in Sociology, *Chinese Journal of Sociology* (2024)
- Guest editor, Special Issue on Novel Methods and Engineering Applications for Network Data Mining, *Mathematical Problems in Engineering* (2021)

Conference and workshop organizer

- Workshop on AI's impact on Society and Advancements in Technology (2023)
- 1st satellite on Science of Team Science and Innovation at the International School and Conference on Network Science (2022)
- Satellite on Quantifying Success at the International School and Conference on Network Science: 2016, 2017, 2018, 2019, 2021
- 8th ACM International Conference on Web Search and Data Mining (WSDM'15)

Reviewer

- Fund: National Science Foundation
- Journal: *ACM Transactions on Information Systems (TOIS), Advances in Complex Systems, BMC Biology, Chinese Journal of Computers, Complexity, eLife, EPJ Data Science, IEEE Transactions on Computational Social Systems (TCSS), IEEE Transactions on Knowledge and Data Engineering (TKDE), IEEE Transaction on Systems, Man and Cybernetics: Systems (SMCS), International Journal of Social Network Mining, Journal of Informatics, Nature Communications, Nature Physics Review, Palgrave*

Communications, PLoS One, Proceedings of the National Academy of Sciences, Royal Society Open Science, Sustainability

Program committee member

- CompleNet: 2016, 2017, 2018, 2019, 2024
- NetSciX: 2018, 2020, 2023
- Complex Networks: 2019

In the press

Media coverage

- Caught in the Crossfire: Fears of Chinese-American Scientists, *Proceedings of the National Academy of Sciences* (2023)
  - Wall Street Journal
  - U.S. News
  - Asian American Scholar Forum
  - Asahi Shimbun
  - Swarma
  - Inside Higher Ed
  - Physics World
  - Phys.org
  - South China Morning Post
  - Counter Punch
  - Foreign Policy
  - DNyuz
  - Deutsche Welle
  - China Daily
  - South China Morning Post
  - Chemistry World
  - Foreign Affairs
  - Scientific American
- Historical comparison of gender inequality in scientific careers across countries and disciplines, *Proceedings of the National Academy of Sciences* (2020)
  - Nature Review Physics
  - Nature Index
  - Inside Higher Ed
  - Northeastern Global News
  - Drug Target Review
  - C&EN
  - Diverse
  - The Paper
  - ScienceNorway
  - PNAS Commentary
- Success in books: a big data approach to bestsellers, *EPJ Data Science* (2018)
  - Northeastern Global News
- Geography and Similarity of Regional Cuisines in China, *PLoS ONE* (2013)
  - Wired
  - MIT Technology Review
  - Pacific Standard