Jian GAO

Contact Information

Affiliation	Northwestern University	☎	: +1 (617)-500-3208
	Kellogg School of Management		: jian.gao1@northwestern.edu
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Research Interests

Summary   I am working in the fields of **Science of Science** and **Computational Socioeconomics**, focusing on studying social and economic phenomena using data-driven methods. I have coauthored **20+ publications** in peer-reviewed journals including **Science**, **Nature**, **Physics Reports**, *J. R. Soc. Interface*, *Regional Studies*, *Scientific Reports*, *Physica A*, *EPL*, etc.

Impact   My works have received in total **555+ citations**, with an **H-index: 13** (by Google Scholar)

Keywords   Science of Science, Computational Socioeconomics, Computational Social Science, Networks

Academic Positions

Northwestern University (NU)   Evanston, IL, USA
2019/09-Present   Postdoctoral Research Fellow, Kellogg School of Management, CSSI & NICO
Mentor: Prof. Dashun Wang

Massachusetts Institute of Technology (MIT)   Cambridge, MA, USA
2016/09-2017/09   Research Assistant, The MIT Media Lab, Collective Learning Group
Mentor: Prof. César A. Hidalgo

Boston University (BU)   Boston, MA, USA
2016/02-2016/04   Visiting Scholar, Department of Physics, Center for Polymer Studies
Mentor: Prof. H. Eugene Stanley

University of Electronic Science and Technology of China   Chengdu, China
2014/09-2019/07   Research Assistant, CompleX Lab & Big Data Research Center
Advisor: Prof. Tao Zhou

2012/09-2014/08   Research Assistant, School of Computer Science and Engineering
Mentor: Prof. Ming-Sheng Shang

Five Representative Publications

[1] **Jian Gao**, Yi-Cheng Zhang & Tao Zhou. Computational socioeconomics. **Physics Reports**, 2019. (Peer-reviewed review article; 5-year Journal Impact Factor: 24.66)

[2] Yian Yin[‡], **Jian Gao**[‡], Benjamin F. Jones & Dashun Wang. Coevolution of policy and science during the pandemic. **Science**, 2021. (‡:contributed equally)

[3] **Jian Gao**, Bogang Jun, Alex Pentland, Tao Zhou & César A. Hidalgo. Spillovers across industries and regions in China's regional economic diversification. **Regional Studies**, 2021.

[4] **Jian Gao** & Tao Zhou. Quantifying China's regional economic complexity. **Physica A: Statistical Mechanics and its Applications**, 2018.

[5] Yi Cao[‡], **Jian Gao**[‡], De-Fu Lian, Zhi-Hai Rong, Jia-Tu Shi, Qing Wang, Yi-Fan Wu[‡], Hua-Xiu Yao[‡] & Tao Zhou[‡]. Orderliness predicts academic performance: Behavioral analysis on campus lifestyle. **Journal of the Royal Society Interface**, 2018. (‡:contributed equally)

Education

2014/09-2019/07	**University of Electronic Science and Technology of China**	Chengdu, China

Ph.D. in *Computer Science*. School of Computer Science and Engineering
Thesis title: Research on the spatial structure and dynamics of socio-economic systems
Advisor: Prof. Tao Zhou

2012/09-2014/08	**University of Electronic Science and Technology of China**	Chengdu, China

Master student in *Computer Science*. School of Computer Science and Engineering
Advisor: Prof. Tao Zhou

2008/09-2012/07	**University of Electronic Science and Technology of China**	Chengdu, China

B.Sc. in *Information and Computing Science*. School of Mathematical Sciences
GPA: 88.6/100 (3.88/4)

Publications (Full List)

‡ : equal contribution   † : corresponding author   Profiles: G R⁶ ⓘD P

arXiv Pre-Print

[3] **Jian Gao**, Yian Yin, Kyle R. Myers, Karim R. Lakhani & Dashun Wang. Loss of new ideas: Potentially long-lasting effects of the pandemic on scientists. arXiv, 2021.

[2] **Jian Gao**[‡], Yian Yin[‡], Benjamin F. Jones & Dashun Wang. Quantifying policy responses to a global emergency: Insights from the COVID-19 pandemic. arXiv:2006.13853, 2020.

[1] **Jian Gao**, Bogang Jun, Alex Pentland, Tao Zhou & César A. Hidalgo. Collective learning in China's regional economic development. arXiv:1703.01369, 2017.

Journal Paper

[25] Luo-Luo Jiang[†], **Jian Gao**[†], Zhi Chen[†], Wen-Jing Li & Jürgen Kurths. Reducing the bystander effect via decreasing group size to solve the collective-risk social dilemma. ***Applied Mathematics and Computation***, 410: 126445, 2021.

[24] **Jian Gao**[†], Bogang Jun, Alex 'Sandy' Pentland, Tao Zhou & César A. Hidalgo[†]. Spillovers across industries and regions in China's regional economic diversification. ***Regional Studies***, 55(7): 1311-1326, 2021.

[23] Yian Yin[‡], **Jian Gao**[‡], Benjamin F. Jones & Dashun Wang. Coevolution of policy and science during the pandemic. ***Science***, 371(6525): 128–130, 2021. (‡:contributed equally)

[22] Bogang Jun, Aamena Alshamsi, **Jian Gao** & César A. Hidalgo. Bilateral relatedness: Knowledge diffusion and the evolution of bilateral trade. ***Journal of Evolutionary Economics***. 30: 247–277, 2020.

[21] **Jian Gao**, Yi-Cheng Zhang & Tao Zhou. Computational socioeconomics. ***Physics Reports***, 817: 1–104, 2019. (Peer-reviewed review article; 5-year Journal Impact Factor: 24.66)

[20] **Jian Gao**[†] & Tao Zhou. Stamp out fake peer review. ***Nature***, 546(7656): 33–33, 2017. (Correspondence opinion piece; Replied by T. Welschot. ***Nature***, 546(7657): 210-210, 2017).

[19] Jun Wang, **Jian Gao**[†], Jin-Hu Liu, Dan Yang & Tao Zhou. Regional economic status inference from online information flow and offline talent mobility. ***EPL***, 125(6): 68002, 2019.

[18] Yi Cao[‡], **Jian Gao**[‡], De-Fu Lian, Zhi-Hai Rong, Jia-Tu Shi, Qing Wang, Yi-Fan Wu[‡], Hua-Xiu Yao[‡] & Tao Zhou[‡]. Orderliness predicts academic performance: Behavioral analysis on campus lifestyle. ***Journal of the Royal Society Interface***, 15: 20180210, 2018.

[17] **Jian Gao**[†] & Tao Zhou. Quantifying China's regional economic complexity. ***Physica A***, 492: 1591–1603, 2018.

[16] Xiao Yang, **Jian Gao**[†], Jin-Hu Liu & Tao Zhou. Height conditions salary expectations: Evidence from large-scale data in China. ***Physica A***, 501: 86–97, 2018.

[15] **Jian Gao**[†] & Tao Zhou. Evaluating user reputation in online rating systems via an iterative group-based ranking method. ***Physica A***, 473: 546–560, 2017.

[14] Qing Wang, **Jian Gao**, Tao Zhou, Zheng Hu & Hui Tian. Critical size of ego communication networks. ***EPL***, 114(5): 58004, 2016.

[13] **Jian Gao**, Tao Zhou & Yanqing Hu. Bootstrap percolation on spatial networks. ***Scientific Reports***, 5: 14662, 2015.

[12] **Jian Gao**, Yu-Wei Dong, Ming-Sheng Shang, Shi-Min Cai & Tao Zhou. Group-based ranking method for online rating systems with spamming attacks. ***EPL***, 110(2): 28003, 2015.

[11] **Jian Gao**[†] & Tao Zhou. Big data reveal the status of economic development. *Journal of University of Electronic Science and Technology of China*, 45(4): 625–633, 2016. In Chinese.

[10] Ling-Jiao Chen & **Jian Gao**[†]. A trust-based recommendation method using network diffusion processes. ***Physica A***, 506: 679–691, 2018.

[9] Ling-Jiao Chen, Zi-Ke Zhang, Jin-Hu Liu, **Jian Gao**[†] & Tao Zhou. A vertex similarity index for better personalized recommendation. ***Physica A***, 466: 607–615, 2017.

[8] Jun Wang, **Jian Gao**, Xiao Yang, Jin-Hu Liu & Tao Zhou. Online data reveal key factors on salary expectation. *Journal of University of Electronic Science and Technology of China*, 48(2): 307–314, 2019. In Chinese.

[7] Wei-Jie You, **Jian Gao** & Tao Zhou. Application of carrier data on precise poverty alleviation and emergency management. *Journal of University of Electronic Science and Technology of China (Social Sciences Edition)*, 20(6): 83–88, 2018. In Chinese.

[6] Linyan Zhang, **Jian Gao**, Xiang Hong & Tao Zhou. Human resource management based on big data. *Big Data Research*, 1: 2015012, 2015. In Chinese.

[5] Jia Yuan, Qian-Ming Zhang, **Jian Gao**, Linyan Zhang, Xue-Song Wan, Xiao-Jun Yu & Tao Zhou. Promotion and resignation in employee networks. ***Physica A***, 444: 442–447, 2016.

[4] Mei Xie, Wei Bai, Qinyuan Wu, **Jian Gao** & Tao Zhou. Impact of high-speed railway on economic development. *Journal of University of Electronic Science and Technology of China*, 49(6): 891–904, 2020. In Chinese.

[3] Dan-Dan Zhao, An Zeng, Ming-Sheng Shang & **Jian Gao**. Long-term effects of recommendation on the evolution of online systems. ***Chinese Physics Letters***, 30: 8901, 2013.

[2] Fangjian Guo, Jiang Su & **Jian Gao**. Finding conspirators in the network via machine learning. *The UMAP Journal*, 33(3): 275–292, 2012. Outstanding paper (MCM/ICM 2011).

[1] **Jian Gao**[†] & Xi-Nan Zhang. Comprehensive scholarship evaluation model in colleges and universities. *Journal of CTBU (Natural Science Edition)*, 29(1): 36–41, 2012. In Chinese.

Conference Paper (w/ or w/o Proceedings)

[3] The moderated curvilinear relationship between work experience diversity and salary (with Lusi Wu & Tao Zhou). 2021 AOM Annual Meeting, HR Division Accepted Paper.

[2] **Jian Gao**[†]. Maximizing the collective learning effects in regional economic development. In: *2017 14th International Computer Conference on Wavelet Active Media Technology and Information Processing (ICCWAMTIP)*, IEEE Press, 2017, pp. 337–341.

[1] Liming Pan, Lei Gao & **Jian Gao**. Link prediction in weighted networks via structural perturbations. In: *2017 14th International Computer Conference on Wavelet Active Media Technology and Information Processing (ICCWAMTIP)*, IEEE Press, 2017, pp. 5–8.

Book Chapter

[3] **Jian Gao**[†], Tao Zhou & Quan-Hui Liu. Computational Socioeconomics: A data-driven framework for quantifying progress towards achieving the Sustainable Development Goals (SDGs). In *Future Cities, New Economy, and Shared City Prosperity Driven by Technological Innovations*, Lei Guo (Eds). United Nations Human Settlements Programme (UN-Habitat): Nairobi GPO KENYA, Ch. 1, pp. 30–43, 2020. In both English & Chinese

[2] Yi Cao, **Jian Gao** & Tao Zhou. Orderliness of campus lifestyle predicts academic performance: A case study in Chinese university. In *Digital Phenotyping and Mobile Sensing: New Developments in Psychoinformatics*, H. Baumeister & C. Montag (Eds). Springer: Berlin, Germany, Ch. 8, pp. 125–137, 2019.

[1] **Jian Gao**, Linyan Zhang, Qian-Ming Zhang & Tao Zhou. Big data human resources: Performance analysis and promotion/resignation in employee networks. *Social Physics: Social Governance*, Yi-Jun Liu (Eds). Beijing: Science Press, Ch. 4, pp. 38–56, 2014. In Chinese.

Work in Progress

[4] The impact of artificial intelligence in science (with Dashun Wang).

[3] The graduate admission networks (with Zhongtao Yue & Tao Zhou).

[2] High-speed rail and talent mobility (with Mei Xie & Tao Zhou).

[1] Peer influence and academic performance (with Yi Cao & Tao Zhou).

Academic Presentations

2021/01	SWARMA Club: Complexity Science Express Series (Invited Talk)	Zoom Talk
2020/11	Northwestern University's COVID-19 Symposia Lightning Talk	Evanston, USA
2020/06	Friday@NICO Seminar (Presented together with Yian Yin)	Evanston, USA
2019/07	Complexity 2019–Complex Science Annual Meeting (Invited Talk)	Shanghai, China
2019/05	CNetSci 2019–China Forum of Network Science	Dalian, China
2018/11	AI&S 2018–AI & Society Academic Salon (Invited Talk)	Chengdu, China
2018/08	BDSC 2018–National Conference on Big Data & Social Computing	Shijiazhuang, China
2018/08	CCDM 2018–China Conference on Data Mining	Jinan, China
2018/01	NetSciX 2018–International School and Conference on Network Science	Hangzhou, China
2017/04	AAG 2017–Economic Geography Sessions	Boston, USA
2017/01	B4 Event–Universidad del Desarrollo	Valparaiso, Chile
2016/03	Interdisciplinary Complex Systems Science Seminar in BU	Boston, USA
2015/10	Symposium on Complexity Science in SWUST	Mianyang, China
2015/06	The Statistical Physics and Complex Systems Conference	Lanzhou, China
2015/06	Symposium of China Inter-discipline Association for Complex Economy	Yantai, China
2014/10	The 10th Chinese Conference on Complex Networks	Changsha, China
2014/07	The 2nd Academic Conference on Complexity Science	Wenzhou, China
2013/10	The 9th Chinese Conference on Complex Networks	Hangzhou, China

Grant Participation

[6] Key Personnel. Developing a quantitative framework to track and assess state-level policy responses to the COVID-19 pandemic. Peter G. Peterson Foundation Pandemic Response Policy Research Fund. $150K. PI: Dashun Wang. 2021-2023.

[5] Participant. Perception and prediction of socioeconomic states based on large-scale data about enterprises, human resources, etc. National Natural Science Foundation of China (No. 11975071). $86K. PI: Tao Zhou. 2020-2023.

[4] Participant. Information confusion in visual analysis of spatio-temporal big data. National Natural Science Foundation of China (No. 61872066). $93K. PI: Jiansu Pu. 2019-2022.

[3] Participant. Relationship between scientific and technological human resources and industrial or economic structure. China Association for Science and Technology (No. 2018ysxh1-4-5-5). $29K. PI: Tao Zhou. 2018-2019.

[2] Participant. Cultural evolution based on complex network analysis. National Natural Science Foundation of China (No. 61703074). $36K. PI: Qian-Ming Zhang. 2017-2019.

[1] Participant. Behavioral pattern analysis of information subject in social networks. National Natural Science Foundation of China (No. 61673086). $23K. PI: Shi-Min Cai. 2017-2017.

Selected Honors & Awards & Scholarships

2019	Provincial Excellent Graduate Student, *Education Department in Sichuan*	(1%)
2019	University Excellent Graduate Student, *UESTC*	(5%)
2012	University Excellent Undergraduate Student, *UESTC*	(7%)
2011	**Outstanding Student** of the University, *UESTC*	(0.2%)
	awarded by the chancellor's office, the highest university honor for undergraduates	
2020	**EPL Highlights of 2019**, corresponding author for *EPL* 125 (2019) 68002	NaN
2018	**Best Poster Award** in the 2018 NetSciX Conference on Network Science	(Top 6)
2014	Best Poster Award in the 2nd Conference on Complexity Science	(Top 3)
2012	**Outstanding Winner** in 2012 Interdisciplinary Contest in Modeling (ICM)	(0.3%)
	COMAP, sponsored by SIAM, NSA and INFORMS	
2010	Second Prize in National Mathematical Contest in Modeling (MCM)	(5%)
2014-2019	University Education Group & Tang Lixin Scholarship, *UESTC*	(0.5%)
2016	**National Scholarship** for Graduate Student, *Ministry of Education*	(5%)
2016	First-class Scholarship for Graduate Student, *UESTC*	(5%)
2016-2017	CSC Scholarship, *China Scholarship Council & Ministry of Education*	NaN
2012-2014	University Graduate Student Scholarship, *UESTC*	(10%)
2009-2011	National Inspiration Scholarship, *Ministry of Education*	(5%)

Industry Experiences

2018-2019	Research Intern. Institution of New Economic Development (iNED)	Chengdu, China
2015-2016	Research Intern. Business Big Data (BBD) Technology Ltd.	Chengdu, China
2013-2014	Research Intern & Algorithm Engineer. Hire Big Data Ltd.	Chengdu, China

Teaching Experiences

Fall 2020	The Genius Bar Assistant, Social Dynamics and Network Analysis, MORS 457	NU
Spring 2018	Invited Lecturer, Computational Socioeconomics, School of Statistics	SWUFE
Fall 2013	TA & Grader, Calculus I (undergraduate), School of Mathematical Sciences	UESTC
Fall 2012	TA, Mathematical Modeling (undergraduate), School of Mathematical Sciences	UESTC

Peer Review Services

◇ Verified Reviews: 148+ times   ◇ Ave. Review: 900+ words (by Publons)

General Audience: Journal of the Royal Society Interface (2018–), Research (2021–), Heliyon (2019–), Patterns (2020–), Scientific Reports (2020–), PLoS ONE (2019–)

Computer/Information: Information Sciences (2020–), Knowledge-Based Systems (2017–), IEEE Transactions on Knowledge and Data Engineering (2016–), Social Network Analysis and Mining (2020–), Expert Systems With Applications (2021–), International Journal of Automation and Computing (2020–), Journal of Computer Science and Technology (2021–), Journal of King Saud University - Computer and Information Sciences (2021–), AI & SOCIETY (2020–), IEEE Access (2019–), Computer Standards and Interface (2017–), Journal of Computational Methods in Sciences and Engineering (2017–), Journal of UESTC (2014–)

Physics/Maths: PLoS Biology (2020–), Journal of Physics: Complexity (2020–), Complexity (2020–), Entropy (2021–), International Journal of Modern Physics C (2018–), Physica Scripta (2018–), Physics Letters A (2017–), Physica A: Statistical Mechanics and its Applications (2016–), Network Science (2021–)

Social/Economy	Frontiers in Psychology (2020–), Area Development and Policy (2019–), Marine Policy (2019–), Socio-Economic Planning Sciences (2021–), Sustainability (2021–), Healthcare (2021–), Academy of Management (AOM) Annual Meeting (2021–)

Media and Blog Coverage

2021	Paper "Coevolution of policy and science during the pandemic" (*Science*) was covered in *Kellogg Insight*, *The Scientist*, *FROMTBOT*, and *Swarma Club Complexity Express*
2019	Paper "Computational socioeconomics" (*Physics Reports*) was covered in *UESTC News*, *Sichuan Observer*, *Science Net Daily*, and *Swarma Club*
2018	Paper "Orderliness predicts academic performance" (*Journal of the Royal Society Interface*) was covered in *China Daily*, *Teach Wire Daily*, *New Scientist*, *Science and Technology Daily*, *Science Net Daily*, *Chengdu Economic Daily*, and *The Beijing News*
2018	Paper "Height conditions salary expectations" (*Physica A*) was covered in *Merry for Money*, *Science Net Blog*, and *Sohu Blog*
2017	Opinion piece "Stamp out fake peer review" (*Nature*) was replied by Springer Nature (Tamara Welschot. *Springer Nature's reply on fake review*. *Nature*, 546(7657): 210-210, 2017) and was covered in *UESTC News*, *Sohu Blog*, and *Science Net Blog*
2016	Paper "Promotion and resignation in employee networks" (*Physica A*) was covered in *Collazo & Keil Blog* and *Science Net Blog*

Computer and Communication Skills

Computing	Python, MATLAB, Stata	◇ Visualization: OriginLab, Gephi, AI, D3
Language	English (fluent), Chinese Mandarin (native)	◇ Typesetting: LaTeX, MS Office

References

Available upon request