

Jian Gao

Contact Information

Affiliation	Northwestern University Kellogg School of Management Center for Science of Science and Innovation (CSSI) Northwestern Institute on Complex Systems (NICO)	☎ : +1 (617)-500-3208 ✉ : jian.gao1@northwestern.edu ✉ : gaojian08@hotmail.com 🌐 : http://www.gaocn.net
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Research Interests

Summary I am working in the emerging field ***Computational Socioeconomics***, focusing on studying social and economic phenomena using data-driven methods. I have published **20+ papers** in peer-reviewed journals including ***Physics Reports*** (IF: 28.3), ***Scientific Reports*** (IF: 5.6), ***Journal of the Royal Society Interface*** (IF: 3.4), ***Physica A*** (IF: 2.1), ***EPL*** (IF: 2.0), etc.

Impact My works have received in total **290+ citations**, with an **H-index: 10** (by [Google Scholar](#))

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

Academic Positions

	Northwestern University Postdoctoral Research Fellow, Kellogg School of Management, CSSI & NICO working with: Prof. Dashun Wang	Evanston, USA
2019/09-Present	Massachusetts Institute of Technology Research Assistant, The MIT Media Lab, Collective Learning Group working with: Prof. César A. Hidalgo	Cambridge, USA
2016/09-2017/09	Boston University Visiting Scholar, Department of Physics, Center for Polymer Studies working with: Prof. H. Eugene Stanley	Boston, USA
2016/02-2016/04	University of Electronic Science and Technology of China Research Assistant, CompleX Lab & Big Data Research Center working with: Prof. Tao Zhou	Chengdu, China
2014/09-2019/07	Research Assistant, School of Computer Science and Engineering working with: Prof. Ming-Sheng Shang	
2012/09-2014/08		

Five Representative Publications

- [1] **Jian Gao**, Yi-Cheng Zhang & Tao Zhou. Computational socioeconomics. ***Physics Reports***, 817: 1–104, 2019.
- [2] **Jian Gao** & Tao Zhou. Quantifying China's regional economic complexity. ***Physica A***, 492: 1591–1603, 2018.
- [3] 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.
- [4] **Jian Gao**, Tao Zhou & Yanqing Hu. Bootstrap percolation on spatial networks. ***Scientific Reports***, 5: 14662, 2015.
- [5] **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.

Education

2014/09-2019/07	University of Electronic Science and Technology of China	Chengdu, China
	Ph.D. in <i>Computer Science</i> . 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 in <i>Computer Science</i> . 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 <i>Information and Computing Science</i> . School of Mathematical Sciences	
	GPA: 88.6/100 (3.88/4)	

Publications (Full List)

‡ : equal contribution † : corresponding author Profiles:    

arXiv Pre-Print

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

Peer-reviewed Papers

- [23] **Jian Gao**, Yi-Cheng Zhang & Tao Zhou. Computational socioeconomics. *Physics Reports*, 817: 1–104, 2019.
- [22] 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.
- [21] **Jian Gao**[†] & Tao Zhou. Quantifying China's regional economic complexity. *Physica A*, 492: 1591–1603, 2018.
- [20] **Jian Gao**[†] & Tao Zhou. Stamp out fake peer review. *Nature*, 546(7656): 33–33, 2017. Opinion piece (Replied by T. Welschot. *Nature*, 546(7657): 210–210, 2017).
- [19] **Jian Gao**[†] & Tao Zhou. Evaluating user reputation in online rating systems via an iterative group-based ranking method. *Physica A*, 473: 546–560, 2017.
- [18] **Jian Gao**, Tao Zhou & Yanqing Hu. Bootstrap percolation on spatial networks. *Scientific Reports*, 5: 14662, 2015.
- [17] **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.
- [16] **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.
- [15] **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.
- [14] 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.
- [13] Ling-Jiao Chen & **Jian Gao**[†]. A trust-based recommendation method using network diffusion processes. *Physica A*, 506: 679–691, 2018.
- [12] 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.
- [11] 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.

- [10] 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.
- [9] Qing Wang, **Jian Gao**, Tao Zhou, Zheng Hu & Hui Tian. Critical size of ego communication networks. *EPL*, 114(5): 58004, 2016.
- [8] 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.
- [7] Linyan Zhang, **Jian Gao**, Xiang Hong & Tao Zhou. Human resource management based on big data. *Big Data Research*, 1: 2015012, 2015. In Chinese.
- [6] Bogang Jun, Aamena Alshamsi, **Jian Gao** & César A. Hidalgo. Bilateral relatedness: Knowledge diffusion and the evolution of bilateral trade. *Journal of Evolutionary Economics*. In press, 2019. DOI: 10.1007/s00191-019-00638-7
- [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] 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.
- [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.

Book Chapters

- [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

- [2] **Jian Gao** & Tao Zhou. Vertex similarity in complex networks, 2018.
- [1] **Jian Gao**, Bogang Jun, Tao Zhou & César A. Hidalgo. Collective learning among industries and regions in Brazilian economic development, 2017.

Academic Presentations

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

- [10] Investigator. Perception and prediction of socioeconomic states based on large-scale data about enterprises, human resources, etc. National Natural Science Foundation of China (No. 11975071). \$85,632. PI: Tao Zhou. 2020-2023.
- [9] Investigator. Information confusion in visual analysis of spatio-temporal big data. National Natural Science Foundation of China (No. 61872066). \$92,768. PI: Jiansu Pu. 2019-2019.
- [8] Investigator. Relationship between scientific and technological human resources and industrial or economic structure. China Association for Science and Technology (No. 2018ysxh1-4-5-5). \$28,544. PI: Tao Zhou. 2018-2019.
- [7] Investigator. Cultural evolution based on complex network analysis. National Natural Science Foundation of China (No. 61703074). \$35,680. PI: Qian-Ming Zhang. 2017-2019.
- [6] Investigator. Behavioral pattern analysis of information subject in social networks. National Natural Science Foundation of China (No. 61673086). \$22,835. PI: Shi-Min Cai. 2017-2017.
- [5] Investigator. Human space-time coupling behavior. National Natural Science Foundation of China (No. 61603074). \$31,398. PI: Zhi-Dan Zhao. 2016-2017.
- [4] Investigator. Performance and behavior predication of employees using big data. National Social Science Foundation of China (No. 15CGL029). \$28,544. PI: Jia Yuan. 2015-2019.
- [3] Investigator. Information recommendation in dynamic online system. National Natural Science Foundation of China (No. 61370150). \$676,895. PI: Ming-Sheng Shang. 2014-2017.
- [2] Investigator. Social network and spreading dynamics. National Natural Science Foundation of China (No. 91324002). \$135,379. PI: Ming-Sheng Shang. 2014-2014.
- [1] Investigator. Statistical physics and information science. National Natural Science Foundation of China (No. 11222543). \$902,527. PI: Tao Zhou. 2013-2015.

Selected Honors & Awards & Scholarships

2019	Provincial Excellent Graduate Student, <i>Education Department in Sichuan</i>	(1%)
2019	University Excellent Graduate Student, <i>UESTC</i>	(5%)
2012	University Excellent Undergraduate Student, <i>UESTC</i>	(7%)
2011	Outstanding Student of the University, <i>UESTC</i> <i>awarded by the chancellor's office, the highest university honor for undergraduates</i>	(0.2%)
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) <i>COMAP, sponsored by SIAM, NSA and INFORMS</i>	(0.3%)
2010	Second Prize in National Mathematical Contest in Modeling (MCM)	(5%)
2014-2019	University Education Group & Tang Lixin Scholarship, <i>UESTC</i>	(0.5%)
2016	National Scholarship for Graduate Student, <i>Ministry of Education</i>	(5%)
2016	First-class Scholarship for Graduate Student, <i>UESTC</i>	(5%)
2016-2017	CSC Scholarship, <i>China Scholarship Council & Ministry of Education</i>	Nan
2012-2014	University Graduate Student Scholarship, <i>UESTC</i>	(10%)
2009-2011	National Inspiration Scholarship, <i>Ministry of Education</i>	(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

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

Reviewer	◇ Verified Reviews: 48	◇ Ave. Review: 800+ words (by Publons)
	Area Development and Policy	2019–
	Marine Policy	2019–
	Heliyon	2019–
	IEEE Access	2019–
	PLoS ONE	2019–
	Journal of the Royal Society Interface	2018–
	International Journal of Modern Physics C (IJMPC)	2018–
	Physica Scripta	2018–
	Knowledge-Based Systems (KBS)	2017–
	Computer Standards and Interface (CSI)	2017–
	Physics Letters A (PLA)	2017–
	Journal of Computational Methods in Sciences and Engineering	2017–
	Physica A: Statistical Mechanics and its Applications	2016–
	IEEE Transactions on Knowledge and Data Engineering (TKDE)	2016–
	Journal of UESTC	2014–

Media and Blog Coverage

2019	Paper “Computational socioeconomics” (<i>Physics Reports</i>) was covered in UESTC News , Sichuan Observer , Science Net Daily , and Swarma Club
2018	Paper “Orderliness predicts academic performance” (<i>Journal of the Royal Society Interface</i>) 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” (<i>Physica A</i>) was covered in Merry for Money , Science Net Blog , and Sohu Blog
2017	Opinion piece “Stamp out fake peer review” (<i>Nature</i>) was replied by Springer Nature (Tamara Welschot. Springer Nature's reply on fake review . <i>Nature</i> , 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” (<i>Physica A</i>) 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 (native)	◇ Typesetting: \LaTeX , MS Office

References

Available upon request