

# Yanqing Hu (胡延庆)

## CONTACT INFORMATION

Department of Statistics and Data Science,  
Southern University of Science and Technology

Homepage: [www.huyanqing.com](http://www.huyanqing.com)

Email: [yanqing.hu.sc@qq.com](mailto:yanqing.hu.sc@qq.com)

## RESEARCH INTERESTS

big data, complex data mining, machine learning, phase transition, percolation, neural networks.

## ACADEMIC POSITIONS

- 2003.07-2006.08 Instructor, Department of Mathematics, Chengdu University of Information Technology
- 2009.11-2010.02 Visiting scholar, Freiburg University, Switzerland
- 2010.07-2011.04 Visiting scholar, Bar-Ilan University, Israel
- 2011.07-2015.07 Associate Professor, Department of Mathematics Southwest Jiaotong University
- 2011.09-2013.08 Research Associate, Levich Institute, City University of New York
- 2014.03-2014.06 Visiting scholar, Boston University
- 2015.08-2021.07 Associate Professor, School of Computer Science and Engineering, Sun Yat-sen University
- 2015.06-2018.05 Adjunct Professor, Big Data Center, University of Electronic Science and Technology of China
- 2019.12-2022.12 Committee Member, Educational Measurement and Evaluation Committee of Educational Technology Association of China
- 2019.12-2021.12 Adjunct Professor, Collaborative Innovation Center of Assessment for Basic Education Quality of China
- 2021.08-present Associate Professor, Department of Statistics and Data Science, College of Science, Southern University of Science and Technology
- 2023.10-present Associate Professor, Center for Complex Flows and Soft Matter Research, College of Engineering, Southern University of Science and Technology

## EDUCATION

- 2006.09-2011.06 Ph.D  
School of Systems Science, Beijing Normal University, Beijing, China
- 1999.09-2003.07 B.S  
Major: Applied Mathematic  
Second Major: Computer Science  
Department of Mathematics and Computer, Changsha University of Science and Technology. Changsha, China

## SELECTED HONORS & AWARDS

- 2011 Beijing Normal Univ. Outstanding Doctoral Dissertation Award
- 2012 Beijing Outstanding Doctoral Dissertation Award

2015 Hundred Talents Program of Sun Yat-sen University  
2018 First Prize of China Computing Communication Annual Conference  
2020 Guangdong Outstanding Youth Fund  
2020 Guangdong Young TopNotch Talents in Technological Innovation

## TEN MOST REPRESENTATIVE RESEARCH PUBLICATIONS

\*: corresponding author

1. **Yanqing Hu\***, Yougui Wang, Daqing Li, Shlomo Havlin, Zengru Di\*. Possible origin for efficient navigation in small worlds. **Phys. Rev. Lett.** 106 (10): 108701 (2011).
2. Saulo Reis, **Yanqing Hu**, et al., Hernan Makse\*, Avoiding catastrophic failure in correlated network of networks. (**equal contribution**) **Nature Physics**, 10 (10): 762-767(2014). (**Cover mention**)
3. **Yanqing Hu**, Shlomo Havlin, Hernan Makse\*, Conditions for Viral Influence Spreading through Multiplex Correlated Social Networks. **Phys. Rev. X**, 4 (2): 021031 (2014).
4. Xin Yuan, **Yanqing Hu\***, H. Eugene Stanley\*, Shlomo Havlin., Eradicating Catastrophic Collapse in Interdependent Networks via Reinforced Nodes. **PNAS**, 114 (13): 3311-3315 (2017).
5. **Yanqing Hu\***, Shenggong Ji, Yuliang Jin, H. Eugene Stanley\*, Shlomo Havlin. Local structure can identify and quantify influential global spreaders in large scale social networks. **PNAS**, 115 (29): 7468-7472. (2018).
6. Wei Wang, Quanhui Lui, Junhao Liang, **Yanqing Hu**, Tao Zhou\*. Coevolution spreading in complex networks. **Physics Reports**, 820: 1-51 (2019).
7. Jiachen Sun, Rui Zhang, Ling Feng, Christopher Monterola, Xiao Ma, Céline Rozenblat, H. Eugene Stanley, Boris Podobnik, **Yanqing Hu\***. Extreme risk induced by communities in interdependent networks. **Communications Physics** (Nature sister journal), 59: 2-45 (2019).
8. Jiachen Sun, Ling Feng, Jiarong Xie, Xiao Ma, Dashun Wang and **Yanqing Hu\***, Revealing the Predictability of Intrinsic Structure in Networks, **Nature Communications** 11(574), (2020). **World Artificial Intelligence Conference Youth Outstanding Paper Nomination Award**
9. Jiarong Xie, Fanhui Meng, Jiachen Sun, Xiao Ma, Gang Yan, **Yanqing Hu\***, Detecting and modeling real percolation phase transition of information spreading in on social media. **Nature Human Behavior**, 5: 1161-1168 (2021). **Cover Story**
10. Jiarong Xie, Xiangrong Wang, Ling Feng, Jinhua Zhao, Wenyuan Liu, Yamir Moreno and **Yanqing Hu\***, Indirect influence in social networks as an induced percolation phenomenon. **PNAS**, 119 (9), (2022)
11. Cong Xu, Xiangrong Wang, Hongwei Hu , Haocheng Qin, Jinghui Wang, Jianqing Shi, **Yanqing Hu\***, A sequential re-opening of provinces for China's zero-COVID policy. **Nature Medicine**. (2023).

12. Junya Wang, Yijiao Zhang, Cong Xu, Jiaze Li, Jiachen Sun, Jiarong Xie, Ling Feng, Tianshou Zhou, and **Yanqing Hu\***, Reconstructing the evolution history of networked complex systems. **Nature Communications**. 15: 2849 (2024)

#### PUBLICATIONS (FULL LIST)

1. Junya Wang, Yijiao Zhang, Cong Xu, Jiaze Li, Jiachen Sun, Jiarong Xie, Ling Feng, Tianshou Zhou, and **Yanqing Hu\***, Reconstructing the evolution history of networked complex systems. **Nature Communications**. 15: 2849 (2024)
2. Chao Liu, Haonan Long, Guanpeng Li, Pengzhen Chen, Zhen Zhang, Jie Huang, Bin Zhu, Xinxin Han, **Yanqing Hu**, Jian Qing Shi\* & Dongfeng Gu, Impact of dynamic self-protection intensity on the COVID-19 pandemic: a case study in Shenzhen based on medical resources. *Biostatistics & Epidemiology*. 8,1, (2024).
3. Cong Xu, Xiangrong Wang, Hongwei Hu, Haocheng Qin, Jinghui Wang, Jianqing Shi, **Yanqing Hu\***, A sequential re-opening of provinces for China's zero-COVID policy. **Nature Medicine**. (2023)
4. Cong Li, Jiarong Xie, Jinhui Wang, Yutian Zeng, Tianshou Zhou, Xiyun Zhang\*, **Yanqing Hu\***, Application of percolation model in spreading dynamics driven by social networks big data. *Europhysics Letters*. 141, 61001 (2023).
5. Ran Zou, Yang Liu, Cong Li, Yijiao Zhang, **Yanqing Hu\***, Graph Representation Learning: A Review. *Journal of Beijing Normal University*, 59(5): 716-724 (2023)
6. Jingtao Ding, Fengli Xu, Hao Sun, Gang Yan, **Yanqing Hu**, Yong Li\* and Tao Zhou\*, Advancements in Artificial Intelligence-Driven Complex Systems Research. *Journal of University of Electronic Science and Technology of China*, (2023)
7. Ming Zhao, Jiani Chen, Jiasheng Lao, **Yanqing Hu**, and Jiarong Xie\*, Transition between distribution patterns in human dynamics with high-activity. *Physical Review Research*, (2023)
8. Shuhong Huang, Jiachen Sun, Ling Feng, Jiarong Xie, Dashun Wang, **Yanqing Hu\***, Identify hidden spreaders of pandemic over contact tracing networks. *Scientific Reports*, (2023)
9. Rui Ma, **Yanqing Hu**, Jin-Hua Zhao\*, Random node reinforcement and  $K$ -core structure of complex networks. *Chaos, Solitons and Fractals* (2023)
10. Jiarong Xie, Xiangrong Wang, Ling Feng, Jinhua Zhao, Wenyan Liu, Yamir Moreno and **Yanqing Hu\***, Indirect influence in social networks as an induced percolation phenomenon. **Proceedings of the National Academy of Sciences of the United States of America**, 119 (9), (2022),
11. Jiarong Xie, Fanhui Meng, Jiachen Sun, Xiao Ma, Gang Yan, **Yanqing Hu\***, Detecting and modeling real percolation phase transition of information spreading on social media. **Nature Human Behaviour** (2021)

12. Jiachen Sun, Ling Feng, Mingwei Du, Xiao Ma, Zhengping Fan, Peter Gloor, and **Yanqing Hu\***, Ultra-Efficient Information Detection on Large-Scale Online Social Networks, *Physica A: Statistical Mechanics and its Applications* (2021)
13. Shuhong Huang, Xiangrong Wang, Liyang Peng, Jiarong Xie, Jiachen Sun, **Yanqing Hu\***, Optimal compression for bipartite networks, *Chaos, Solitons and Fractals* (2021)
14. Fanhui Meng, Haoming Sun, Jiarong Xie, Chengjun Wang, Jiajing Wu, and **Yanqing Hu\***, Preference for Number of Friends in Online Social Networks. *Future Internet* (2021)
15. Jiachen Sun, Ling Feng, Jiarong Xie, Xiao Ma, Dashun Wang, and **Yanqing Hu\***, Revealing the Predictability of Intrinsic Structure in Networks, **Nature Communications** 11(574), (2020).
16. Jiarong Xie, Jiachen Sun, Xun Liu, Xiaoqiang Sun, Qun He, **Yanqing Hu\***, A Predictive Model for COVID-19 Spreading. *Chin Sci Bull*, 65(22): 2348-2355 (2020).
17. Jiarong Xie, Fanhui Meng, Yiwen Huang, Zhengping Fan, Xiao Ma and **Yanqing Hu\***, Optimal devoted resource strategies to epidemic extinction by increasing recovery rate. *International Journal of Modern Physics C*, 31(1): 2050010 (2020).
18. Xiaolong Chen, Tianshou Zhou, Ling Feng, Junhao Liang, Fredrik Liljeros, Shlomo Havlin, and **Yanqing Hu\***, Nontrivial resource requirement in the early stage for containment of epidemics. *Physical Review E*, 100(3): 032310 (2019).
19. Jiazhe Li, Yan Wang, Shuhong Huang, Jiarong Xie, Louis Shekhtman\*, **Yanqing Hu**, Shlomo Havlin, Recent progress on cascading failures and recovery in interdependent networks. *International Journal of Disaster Risk Reduction*, 40: 101266 (2019). (**Invited Review**)
20. Jiarong Xie, Youyou Yuan, Zhengping Fan, Jiahai Wang, Jiajing Wu and **Yanqing Hu\***, Eradicating abrupt collapse on single network with dependency groups. *Chaos* **29**, 29(8): 083111 (2019). (**Featured Article**).
21. Wei Wang, Quanhui Lui, Junhao Liang, **Yanqing Hu**, Tao Zhou\*. Coevolution spreading in complex networks. **Physics Reports** (IF:28.3), j. physrep. 820: 1-51 (2019).
22. Jiarong Xie, Mingwei Du, Zengru Di, Huaiwei Zhu, Ying Fan, **Yanqing Hu\***, Measuring Intrinsic Significance of Community Structure. *International Journal of Modern Physics C*, 30(9): 1950068 (2019).
9. Jiachen Sun, Rui Zhang, Ling Feng, Christopher Monterola, Xiao Ma, Céline Rozenblat, H. Eugene Stanley, Boris Podobnik, **Yanqing Hu\***. Extreme risk induced by communities in interdependent networks. **Communications Physics** (**Nature sister journal**), 59: 2-45, (2019).
10. **Yanqing Hu\***, Shenggong Ji, Yuliang Ling, H. Eugene Stanley\*, Shlomo Havlin, Local Determines Global: Identification and Quantification of Influential Spreaders in Large Scale Social Networks, **PNAS**, 115 (29): 7468-7472, (2018).
11. Jiachen Sun, Rui Liu, Z Fan, J Xie, X Ma, **Yanqing Hu\***, Lower bound of network dismantling problem. *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 28 (6): 063128, (2018).

12. Zexun Wang, D Zhou, **Yanqing Hu\***, Group percolation in interdependent networks. *Physical Review E* 97: 032306 (2018).
13. Jiachen Sun, Junyou Dong, Xiao Ma, L Feng, **Yanqing Hu\***, Predicting the global spread range via small subnetworks. *EPL*, 118 (2): 28004 (2017).
14. Xin Yuan, **Yanqing Hu\***, H. Eugene Stanley\*, Shlomo Havlin. Eradicating Catastrophic Collapse in Interdependent Networks via Reinforced Nodes. *PNAS*, 114 (13): 3311-3315, (2017).
15. J Liang, **Yanqing Hu**, G Chen, T Zhou, A universal indicator of critical state transitions in noisy complex networked systems. *Scientific Reports* 7: 42857, (2017).
16. **Yanqing Hu**, Y Fan, Z Di, Orientation in social networks. *Journal of Systems Science and Complexity* 30 (1): 20-29 (2017).
17. Sheng Gong Ji, Linyuan Lu, Chi Ho Yeung, **Yanqing Hu\***, Effective spreading from multiple leaders identified by percolation in the susceptible-infected-recovered (SIR) model. *New Journal of Physics* 9, 19 (7): 073020, (2017).
18. Dunbiao Niu, Xin Yuan, Minhui Du, H. Eugene Stanley, **Yanqing Hu\***, Percolation of networks with directed dependency links. *Physical Review E*, 93 (4): 042312 (2016).
19. J Gao, T Zhou, **Yanqing Hu\***, Bootstrap percolation on spatial networks. *Nature Scientific Reports*, 5: 14662 (2015).
20. D. L Johnson, **Yanqing Hu**, H Makse, Density of states in granular media in the presence of damping. *Physical Review E*, 91(6): 062208 (2015).
21. L Feng, CP Monterola, **Yanqing Hu\***, The simplified self-consistent probabilities method for percolation and its application to interdependent networks. *New Journal of Physics*, 17 (6): 063025, (2015).
22. L Feng, **Yanqing Hu**, B Li, HE Stanley, S Havlin, LA Braunstein, Competing for Attention in Social Media under Information Overload Conditions. *Plos one*, 10 (7): e0126090 (2015).
23. Saulo Reis, **Yanqing Hu**, Andrés Babino, Jose Andrade Jr., Santiago Canals, Mariano Sigman, and Hernan A. Makse, Avoiding catastrophic failure in correlated network of networks. **Nature Physics**. NPHYS3081 (2014). (Equal contribution, cover mention).
24. **Yanqing Hu**, Shlomo Havlin, Hernan Makse, Conditions for Viral Influence Spreading through Multiplex Correlated Social Networks. **Phys. Rev. X**, 4: 021031 (2014).
25. **Yanqing Hu**, Hernan A. Makse, John J. Valenza and David L. Johnson. Frequency-dependent attenuation and elasticity in unconsolidated earth materials: Effect of damping. *Geophysics*, 79 (6), (2014).

26. **Yanqing Hu**, David L. Johnson, John J. Valenza, Francisco Santibanez, and Hernan A. Makse. Stress-dependent normal-mode frequencies from the effective mass of granular matter. *Phys. Rev. E* 89, 062202 (2014).
27. Chong Wu, Shengong Ji, Rui Zhang, Liujun Cheng, Jiawei Cheng, Xiaobin Li and **Yanqing Hu\***. Multiple hybrid phase transition: Bootstrap percolation on complex networks with communities. *Europhysics Letter*. 107.48001, (2014).
28. **Yanqing Hu**, Dong Zhou, Rui Zhang, Zhangang Han, Celine Rozenblat and Shlomo Havlin. Percolation of interdependent networks with inter-similarity. *Phys. Rev. E* 88: 052805 (2013).
29. **Yanqing Hu\***, Yougui Wang, Daqing Li, Shlomo Havlin, Zengru Di\*. Possible origin for efficient navigation in small worlds. **Phys. Rev. Lett.** 106: 108701 (2011).
30. **Yanqing Hu**, Jiang Zhang, Di Huan and Zengru Di, Toward a general understanding of the scaling laws in human and animal mobility. *Eur. Phys. Lett.*, 96: 38006 (2011).
31. An Zeng, Dong Zhou, **Yanqing Hu\***, Ying Fan, Zengru Di, Dynamics on Spatial Networks and the Effect of Distance Coarse Graining. *Physical A* 390: 21-22, (2011).
32. **Yanqing Hu\***, Baruch Ksherim, Reuven Cohen and Shlomo Havlin, Percolation in interdependent and interconnected networks: Abrupt change from second-order to first-order transitions. *Phys. Rev. E* 84: 066116 (2011).
33. An Zeng, **Yanqing Hu** and Zengru Di, Unevenness of loop location in complex networks. *Phys. Rev. E* 81: 046121 (2010).
34. Xiaojia Li, Menghui Li, **Yanqing Hu**, Zengru Di and Ying Fan, Detecting community structure from coherent oscillation of excitable systems. *Physical A* 389: 164-170 (2010).
35. **Yanqing Hu\***, Yuchao Nie, Hua Yang, Jie Cheng, Ying Fan, Zengru Di. Measuring Significance of Community Structure in Complex Networks. *Phys. Rev. E*, 082: 066106 (2010).
36. Jiefei Yu, **Yanqing Hu**, Min Yu, Zengru Di. Analyzing Netizen's View and Reply Behaviors on the Forum. *Physica A* 389: 3267-3273 (2010).
37. Y. Li, D. Zhou, **Yanqing. Hu\***, J. Zhang and Z. Di. Exact solution for optimal navigation with total cost restriction. *Eur. Phys. Lett.* 92: 58002 (2010).
38. Hua Yang, Yuchao Nie, Ying Fan, **Yanqing Hu\***, Zengru Di. Scaling properties in spatial networks and its effects on topology and traffic dynamics. *Eur. Phys. Lett.* 89, 58002 (2010).
39. Y Li, **Yanqing Hu**, J Zhang, ZR Di, Review on Spatial Networks Complex Systems and Complexity Science, 7 (2-3):145-164 (2010).
40. J Cheng, **Yanqing Hu**, Z Di, Y Fan, *Computer Physics Communications*, 181(10): 1697-1701 (2010).

41. A. Zeng, **Yanqing Hu** and Z. Di, Optimal tree for both synchronizability and converging time. *Eur. Phys. Lett.*, 87: 48002 (2009). (**Cover**)
42. **Yanqing Hu**, J. Wu and Z. Di, Enhance the efficiency of heuristic algorithms for maximizing the modularity. *Eur. Phys. Lett* 85: 18009 (2009).
43. Liang Gao, **Yanqing Hu\*** and Zengru Di, Accuracy of the ball-covering approach for fractal dimensions of complex networks and a rank-driven algorithm. *Phys. Rev. E* 78: 046109 (2008).
44. **Yanqing Hu**, Hongbin Chen, Peng Zhang, Menghui Li, Zengru Di and Ying Fan, Comparative definition of community and corresponding identifying algorithm. *Rev. E* 78: 026121 (2008).
45. **Yanqing Hu**, Menghui Li, Peng Zhang, Ying Fan, Zengru Di, Community detection by signaling on complex networks. *Phys. Rev. E* 78: 016115 (2008).

## CONFERENCES

### List of selected invited talks

1. 2013, The 9th Chinese Conference on Complex Networks and the 6th China-EU Summer School for Non-equilibrium Organizations, Keynote speaker, Hangzhou.
2. 2014 Chinese Physical Society Fall Meeting, Haerbin.
3. 2015, The 8th International Congress on Industrial and Applied Mathematics, Beijing.
4. 2016, The 2016 Chinese Physical Society Fall Meeting, Beijing.
5. 2017, Institute of High Performance Computing, A\*STAR, Singapore.
6. 2017, The 2017 Chinese Physical Society Fall Meeting, Sichuan.
7. 2017, The 13th Chinese Conference on Complex Networks, Shenzhen.
8. 2017, The First International Conference on Educational Big Data Mining and Application, Beijing.
9. 2018, The Global Artificial Intelligence and Education Big Data Summit, Beijing.
10. 2018, Complexity Community Sharing Session, Nanyang Technological University, Singapore.
11. 2019, the 2019 Annual Conference of Computational Communication. Guangzhou.
12. 2019, Opening Ceremony of Beijing Normal University Computational Communication Center, Zhuhai.
13. 2019, Symposium on Neural Networks and Complex Networks, Yicang.
14. 2019, The 2nd Symposium on Computing Methods in Statistical Physics, Dali.
15. 2020, The 5th National Conference on Neurodynamics, Hangzhou.
16. 2020, International series of conferences on dynamical systems and complexity (Dynamics Days Asia-Pacific), Singapore.

## **TEACHING**

Principles and Practice of Big Data in Education, Mathematical Modeling, Complex Networks, Linear Algebra, Discrete Mathematics, Operational Research, MATLAB Programming, Numerical Analysis.

## **SERVICE**

### **Reviewer**

PNAS, Nature Machine Intelligence, Nature Communications, Scientific Reports, PloS ONE, Physics and Computer science: PRL, PRE, Chaos, IJMPC, EPL, Physica A, Complexity, IEEE Access, Artificial Intelligence Review, Journal of Statistical Physics

### **Program Committee Member**

2019, Conference on Complex Systems, Singapore

2019, Conference on Systems Science of China

2020, Netsci-2020, Japan

2020, Conference on Systems Science of China

### **Grant Reviewer**

General Program of NSFC

Youth Program of NSFC

Natural Science Foundation of Guangdong Province