

# Yanqing Hu (胡延庆)

## CONTACT INFORMATION

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## RESEARCH INTERESTS

Complex networks, complex data mining, social networks, phase transition, percolation, machine learning, 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-present    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

## 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

## 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., Avoiding catastrophic failure in correlated network of networks. **(equal contribution) Nature Physic**, 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).
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**, (2021). In press

## PUBLICATIONS (FULL LIST)

1. 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).
2. 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).
3. 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).

4. 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).
5. 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**)
6. 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**).
7. 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).
8. 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. Shenggong 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

### **IN THE PRESS**

#### **List of selected media coverages**

2014, [Nature Physics](#): Multilayer networks: Dangerous liaisons?

2017, [SYSU](#):Eradicating catastrophic collapse in interdependent networks via reinforced nodes.

2018, [中国科学报](#) : 谁是社交网络最优传播者.

2018, [SYSU News](#), A breakthrough in identifying and quantifying influential global spreaders in big-data social networks.

2020, 新型冠状病毒肺炎拐点已到? News: [科学网](#), [网易](#), [搜狐网](#)