Hui-Jia Li

Full Professor

Affliation: School of Science, Beijing University of Posts and Telecommunications

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Profile

Hui-Jia Li now is a Full Professor and Distinguished Research Fellow at the School of Science, Beijing University of Posts and Telecommunications. He received his Ph.D. degree in Optimization and Control theory from AMSS, Chinese Academy of Sciences in 2013. He now is the PI of Key Laboratory of Big Data Mining and Knowledge Management in BUPT. He has published more than 100 high quality journal papers, including on *PNAS, IEEE TKDE, ACM TKDD, IEEE TCYB, IEEE TII, PHY. REV*. and et al, and has received the Outstanding Reviewer Awards of more than 10 Elsevier Journals. He is now the editorial board member of *Plos One*, *Frontiers in Physics*, *Palgrave Communications* and other journals. His current interest includes Mathematical and Statistical Modeling on Complex Systems and Network Theory, and Optimization and Applied Mathematics.

Research Interests

- ✧ **Complex Systems and Network Theory**
- ✧ **Statistical physics of social systems**
- ✧ **Optimization and Applied Mathematics**
- ✧ **Self-organization and collective behavior**
- ✧ **Epidemic spreading and behavior vaccination**

Education

- ✧ **PhD in Optimization and Control theory, Academy of Mathematics & Systems Science, Chinese Academy of Sciences**, Beijing, China

Thesis title: Study of Community Structure in Complex Networks. 2013. Supervisor: Prof. Xiang-Sun Zhang

- ✧ **BSc in Computer Science and Technology, Shandong Normal University**, Jinan, China

Thesis title: The study of similarity on images. 2007

Employment

- ✧ **Full Professor, Distinguished Research Fellow**, Beijing, China

School of Science, Beijing University of Posts and Telecommunications, Jul. 2019 – now

- ✧ **Associate Professor** Beijing, China

School of Management Science and Engineering, Central University of Finance and Economics, Nov. 2016 – June.2019

- ✧ **Assistant Professor** Beijing, China

School of Management Science and Engineering, Central University of Finance and Economics, Sep. 2013 – Oct. 2016

✧ **Research Assistant** Arlington, Texas, USA

Department of Computer Science and Engineering, University of Texas at Arlington, Oct. 2012 – Feb. 2013

PI: Prof. Chris Ding

Editorial Boards:

✧ Frontiers in Physics **(2019-), Associate Editor**

✧ PLOS One **(2018-), Associate Editor**

✧ Palgrave Communications **(2019-), Associate Editor**

✧ ICSES Transactions on Data Science, Engineering and Technology **(2017-), Editor**

✧ Journal of Liangcheng University (Natural Science Edition) **(2017-), Review Editor**

Featured Publications List (H10-Index=32, H-Index=**23** in Google Scholar)

[1] Xuelong Li, Marko Jusup, Zhen Wang, **Hui-Jia Li**, Lei Shi, Boris Podobnik, H. Eugene Stanley, Shlomo Havlin, Stefano Boccaletti. Punishment diminishes the benefits of network reciprocity in social dilemma experiments. ***Proceedings of the National Academy of Sciences of the United States of America* (*PNAS*)**, 2018, 115 (1), 30-35.

[2] **Hui-Jia Li*,** Lin Wang, Zhan Bu, Jie Cao and Yong Shi. Measuring the network vulnerability based on Markov criticality. ***ACM Transactions on Knowledge Discovery from Data,*** 16, 2, 1-24, 2021. (**Corresponding author**)

[3] **Hui-Jia Li***, Zhen Wang, Jie Cao, Jian Pei and Yong Shi. Optimal estimation of low-rank factors via feature level data fusion of multiplex signal systems. ***IEEE Transactions on Knowledge and Data Engineering***, 10.1109/TKDE.2020.3015914, 2021. (**Corresponding author**)

[4] **Hui-Jia Li**, Wenze Xu, Shenpeng Song, Wenxuan Wang, Matjaz Perc. The dynamics of epidemic spreading on signed networks. ***Chaos, Solitons and Fractals***, 151, 111294, 2021.

[5] Jinlong Ma, Min Li, **Hui-Jia Li***. Traffic dynamics on multilayer networks with different speeds. ***IEEE Transactions on Circuits and Systems II: Express Briefs***, 10.1109/TCSII.2021.3102577, 2021. (**Corresponding author**)

[6] **Hui-Jia Li***, Lin Wang, et al. Editorial: Mathematical Modelling of the Pandemic of 2019 Novel Coronavirus (COVID-19): Patterns, Dynamics, Prediction, and Control. ***Frontiers in Physics***, 9, 738602, 2021. (**Corresponding author**)

[7] Chengyi Xia, Yongping Luo, Li Wang, **Hui-Jia Li.** A Fast Community Detection Algorithm Based on Reconstructing Signed Networks**. *IEEE Systems Journal*,** 10.1109/JSYST.2021.3065378, 2021.

[8] Zhan Bu, **Hui-Jia Li***, Zhen Wang, Guangliang Gao, Jie Cao. Dynamic Cluster Formation

Game for Attributed Graph Clustering. *IEEE Transactions on Cybernetic*, 49(1), 328-341, 2019. (**Corresponding author**)

[9] **Hui-Jia Li**, Zhan Bu, Zhen Wang, Jie Cao*. Dynamical clustering in electronic commerce systems via optimization and leadership expansion, *IEEE Transactions on Industrial Informatics*, 16, 8, 5327-5334, 2020.

[10] **Hui-Jia Li**, Lin Wang, Yan Zhang, Matjaz Perc. Optimization of identifiability for efficient community detection. *New Journal of Physics*, 22, 063035, 2020.

[11] **Hui-Jia Li**, Zhan Bu, Zhen Wang, Jie Cao, et al. Enhance the performance of network computation by a tunable weighting strategy. *IEEE Transactions on Emerging Topics in Computational Intelligence*, 2018, 2(3), 214-223.

[12] **Hui-Jia Li**, Zhan Bu, Aihua Li, Zhidong Liu, Yong Shi. Fast and accurate mining the community structure: integrating center locating and membership optimization, *IEEE Transactions on Knowledge and Data Engineering*, 2016, 28(9): 2349- 2362.

[13] **Hui-Jia Li**, Qing Cheng, Lin Wang. Understanding spatial spread of emerging infectious diseases in contemporary populations. *Physics of Life Reviews*, 2016, 19: 95.

[14] Zhan Bu, **Hui-Jia Li**, Chengcui Zhang, Jie Cao, and et al. Graph K-means based on Leader Identification, Dynamic Game and Opinion Dynamics. *IEEE Transactions on Knowledge and Data Engineering*, 10.1109/TKDE.2019.2903712, 2019.

[15] Jie Cao, Zhan Bu, Yuyao Wang, Huan Yang, Jiuchuan Jiang and **Hui-Jia Li**. Detecting Prosumer-Community Groups in Smart Grids from the Multi-Agent Perspective. *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 49(8), 1652-1664, 2019.

[16] Hong-Hai Qiao, Zheng-Hong Deng, **Hui-Jia Li***, et. al. Research on historical phase division of terrorism: an analysis method by time series complex network. *Neurocomputing*, 420, 246-265, 2021. (**corresponding author**)

[17] **Hui-Jia Li**, J J. Daniels. Social significance of community structure: Statistical view, *Physical Review E*, 2015, 91(1): 012801.

[18] **Hui-Jia Li,** Lin Wang. Multi-scale asynchronous belief percolation model on multiplex networks. *New Journal of Physics*, 21, 015005, 2019.

[19] **Hui-Jia Li**, Yong Wang, Ling-Yun Wu, Zhi-Ping Liu, Luonan Chen, Xiang-Sun Zhang. Community structure detection based on Potts model and spectral characterization, *EPL(Europhysics Letters)*, 2012, 97(4): 48005.

[20] Zhan Bu, Guangliang Gao, **Hui-Jia Li***, Jie Cao. CAMAS: A Cluster-Aware Multiagent System for Attributed Graph Clustering, *Information Fusion*, 37, 10-21, 2017. (**Corresponding author**)

[21] **Hui-Jia Li**, Hao Wang, Luonan Chen. Measuring robustness of community structure in complex networks, *EPL (Europhysics Letters)*, 2015, 108(6): 68009.

[22] **Hui-Jia Li**, Xiang-Sun Zhang. Analysis of stability of community structure across multiple hierarchical levels, *EPL (Europhysics Letters)*, 2013, 103(5): 58002.

[23] **Hui-Jia Li**, Yong Wang, Ling-Yun Wu, Junhua Zhang, Xiang-Sun Zhang. Potts model based on a Markov process computation solves the community structure problem

effectively, *Physical Review E*, 2012, 86(1): 016109.

[24] **Hui-Jia Li***, Qian Wang, Shenfeng Liu, Jun Hu. Exploring the trust management mechanism in self-organizing complex network based on game theory. *Physica A: Statistical Mechanics and its Applications*, 542, 123514, 2020. **(Corresponding author)**

[25] Zhan Bu, Yuyao Wang, **Hui-Jia Li**, et al. Link prediction in temporal networks: Integrating survival analysis and game theory. *Information Sciences*, 498, 41-61, 2019.

[26] Zhen Su, Xiaohui Mu, Yang Dai and **Hui-Jia Li***. Defectors for high degree with adaptive interactions. *Physica A: Statistical Mechanics and its Applications*, 527, 121132, 2019. **(Corresponding author)**

[27] Ju Xiang, Yan Zhang, Jian-Ming Li, **Hui-Jia Li**, and Min Li. Identifying multi-scale communities in networks by asymptotic surprise. *Journal of Statistical Mechanics: Theory and Experiment*, (2019) 033403, 2019.

[28] Guijun Li, Zhidong Liu, Jun Hu, **Hui-Jia Li**. Understanding the network optimization based on the Physarum-inspired model. *Physics of Life Reviews*, 10.1016/j.plrev.2019.01.018, 2019.

[29] Sheng Wei, Shuqing N. Teng, **Hui-Jia Li**, et al. Hierarchical structure in the world's largest high-speed rail network. *Plos One*,14(2): e0211052, 2019.

[30] Ju Xiang, **Hui-Jia Li***, Zhan Bu, et al. Critical analysis of (Quasi-)Surprise for community detection in complex networks. *Scientific Reports*, 8, 14459, 2018. **(Corresponding author)**

[31] Ke Hu, Jing-Bo Hu, Liang Tang, Ju Xiang, Jin-Long Ma, Yuan-Yuan Gao, **Hui-Jia Li***, Yan Zhang. Predicting disease-related genes by path structure and community structure in protein-protein networks. *Journal of Statistical Mechanics: Theory and Experiment*, (2018): 100001, 2018. **(Corresponding author)**

[32] Guangliang Gao, Jie Cao, Zhan Bu, **Hui-Jia Li***, Zhiang Wu. A generalized game theoretic framework for mining communities in complex networks. *Expert Systems With Applications*, 96, 450-461, 2018. (**Corresponding author**)

[33] Zhan Bu, Jie Cao, **Hui-Jia Li**, Guangliang Gao, Haicheng Tao. GLEAM: a graph clustering framework based on potential game optimization for large-scale social networks. *Knowledge and Information Systems*, 55(3), 741-770, 2018.

[34] **Hui-Jia Li**, Zhan Bu, Yulong Li, Zhongyuan Zhang, et al. Evolving the attribute flow for dynamical clustering in signed networks. *Chaos, Solitons & Fractals*, 110, 20-27, 2018.

[35] **Hui-Jia Li**, Qing Cheng, He-JinMao, Huanian Wang, JunhuaChen. Uncovering the effective interval of resolution parameter across multiple community optimization measures. *International Journal of Modern Physics B*, 2017, 30: 1750036.

[36] Ying-Hong Ma, **Hui-Jia Li**, Xiao-Dong Zhang. Weighted tunable clustering in local-world networks with increment behavior. *Journal of Statistical Mechanics: Theory and Experiment*, 2010, 11: 11009.

[37] **Hui-Jia Li**, HJ Chen, J Zhang, CY Xiong, J Fang. Statistical searching of deformation phases on wavelet transform maps of fringe patterns. *Optics & Laser Technology*, 2007, 39

(2), 275-281.

[38] **Hui-Jia Li**, Junhua Zhang, Zhi-Ping Liu, Luonan Chen, Xiang-Sun Zhang. Identifying overlapping communities in social networks using multi-scale local information expansion, *European Physical Journal B*, 2012, 85(6): 109.

[39] **Hui-Jia Li**, Hui-Ying Li. Scalably revealing the dynamics of soft community structure in complex networks, *Journal of Systems Science and Complexity*, 2016, 29(4): 1071-1088.

[40] **Hui-Jia Li**. The comparison of significance of fuzzy community partition across optimization methods, *Journal of Intelligent & Fuzzy Systems*, 2015, 29(6): 2707-2715.

[41] **Hui-Jia Li**, Huiying Li, Chuanliang Jia. A novel dynamics combination model reveals the hidden information of community structure, *International Journal of Modern Physics C*, 2015, 26(4): 1550043.

[42] **Hui-Jia Li,**Bingying Xu, Liang Zheng, Jia Yan. Integrating attributes of nodes solves the community structure partition effectively, *Modern Physics Letters B*, 2014, 28(5): 14500.

[43] Shi Chen, Zhi-Zhong Wang, Liang Tang, Yan-Ni Tang, Yuan-Yuan Gao, **Hui-Jia Li**, Ju Xiang and Yan Zhang. Global vs local modularity for network community detection. *Plos One*, 13(10):e0205284, 2018.

[44] Ju Xiang, Zhi-Zhong Wang, **Hui-Jia Li***, et. al. Community detection based on significance optimization in complex networks. *Journal of Statistical Mechanics: Theory and Experiment*,2017,5:053213. (**Corresponding author**)

[45] **Hui-Jia Li**. Detecting fuzzy network communities based on semi-supervised label propagation, *Journal of Intelligent & Fuzzy Systems*, 2016, 31(6):2887-2893.

[46] Zhan Bu, **Hui-Jia Li**, Jie Cao, Zhiang Wu, Lu Zhang, Game theory based emotional evolution analysis for chinese online reviews. *Knowledge-Based Systems*, 2016, 103: 60-72.

[47] **Hui-Jia Li**, Ju Xiang. *Journal of Intelligent & Fuzzy Systems*, 2017, 32(6): 4503-4511.

Professional Activities

Society Memberships:

✧ The Royal Statistical Socialty (RSS) Fellow (No. 203024)

✧ IEEE Member (No.93915704)

✧ ACM Member (No.0743516)

✧ IEEE-CS Member (No.s186216)

✧ CCF (China Computer Federation) Member(No.0743516)

✧ The Operations Research Society of China (No.S390021329M)

Reviewer:

✧ Peer reviewer for more than 30 journals including: *Nature Communications, Information Sciences, Pattern Recognition, Scientific Reports, PLOS One, IEEE Transactions on Knowledge and Data Engineering, IEEE Transactions on Emerging Topics in Computational Intelligence, Frontiers in Physics, Journal of Theoretical Biology, Royal Society Open Science, Complexity, Physical Review E, Europhysics Letters, Nonlinear*

Dynamics, Physica A, European Physical Journal B, Chaos, Solitons & Fractals, Physics Letter A, Modern Physics Letters B, International Journal of Modern Physics C, Applied Mathematics and Computation, Chinese Physics Letters, Chinese Physics B, IEEE Transactions on Cybernetics, IEEE/ACM Transactions on Networking, IEEE Transactions on Circuits and Systems II, IEEE Transactions on Automation Science and Engineering and et al.

Research Grants

[1] The mining, fusion and applications of multi-sources heterogeneous big data in O2O E-bussiness model**. National Nature Science Foundation of China (Grants 71871233)**, 2019.01-2022.12, **PI**

[2] The mining, fusion and applications of big data in O2O E-bussiness model, **Beijing Natural Science Foundation(Grants 9182015)**, 2018.01-2020.12, **PI**

[3] The study of hidden patterns and dynamical evolution mechanisms of community structure in social network, **National Nature Science Foundation of China (Grants 71401194)**, 2015.01-2017.12, **PI**

[4] The Trend Prediction of Financial Market and Public Emotion from the Perspective of Social Network. **Young Elite Teacher Project of Central University of Finance and Economics Grants, (Grants QYP 1603)**, 2016.01-2018.12, **PI**

[5] The optimization problems in complex networks and their applications in systems biology. **National Nature Science Foundation of China (Grants 11131009)**, 2014.01-2016.12, **Co-PI**

[6] The theories and methods of unconventional emergency case reasoning supported by emergency decision making. **National Nature Science Foundation of China (Grants 91324203)**,2014.01-2016.12, **Co-PI**

Awards

✧ The Elsevier Outstanding Reviewer Awards of *Knowledge-Based Systems* 、 *Applied Mathematics and Computation*、*Computational Statistics & Data Analysis*、*Physics Letters A*、 *Physica A*、 *Chaos, Solitons & Fractals*、 *Computers & Electrical Engineering*

✧ The Excellent Scholar of Central University of Finance and Economics, 2017

✧ Young Elite Teacher of Central University of Finance and Economics, 2016

✧ The Excellent paper award in World Congress on Intelligent Control and Automation (WCICA) in 2012

✧ The Presidential Outstanding Research Scholarship from Academy of Mathematics and Systems

Selected Invited talks

[1] Measuring the network vulnerability based on Markov criticality. **The China Automation congress,** 2020.

[2] Punishment diminishes the benefits of network reciprocity in social dilemma experiments. **International Conference on Management and Operations Research**, 2017.

[3] Detecting fuzzy network communities based on semi-supervised label propagation. **The 2016**

International Conference on Fuzzy System and Data Mining, 2016.

[4] Predicting disease-related genes by path-based similarity and community structure in protein-protein interaction network. **The 10th International Conference on Systems Biology**, 2016.

[5] Explore of the fuzzy community structure integrating the directed line graph and likeli hood optimization **International Conference on Management and Operations Rese arch**, 2016.

[6] The comparison of significance of fuzzy community partition across optimization **The 2015 International Conference on Fuzzy System and Data Mining**, 2015.

[7] Fast community detection algorithm based on relationship strength coupling in social networks.**13th International Symposium on Operations Research and its Applications in Engineering, Technology and Management**, 2015.

[8] A study of inflammation immunization strategy in weighted complex network.**International Symposium on Operations Research and its Applications in Engineering, Technology and Management**, 2013.

Research Advising

PhD Supervision:

- ✧ Ms. Wenxuan Wang (now at Beijing University of Posts and Telecommunications)
- ✧ Mr. Yuanhao Li (now at Beijing University of Posts and Telecommunications)
- ✧ Mr. Shihai Wang (now at Beijing University of Posts and Telecommunications)
- ✧ Ms. Luokun Ren (now at Tsinghua University)
- ✧ Mr. ZhaianBian (now at Central University of Finance and Economics)
- ✧ Mr. QilinLi (now at Central University of Finance and Economics)

Master Supervision:

- ✧ Siru Chen (now at Beijing University of Posts and Telecommunications)
- ✧ Shenpeng Song (now at Beijing University of Posts and Telecommunications)
- ✧ Chenyang Qiu (now at Beijing University of Posts and Telecommunications)
- ✧ Zhaoci Huang (now at Beijing University of Posts and Telecommunications)
- ✧ Ms. Jiaqi Yan (now at Central University of Finance and Economics)
- ✧ Ms. Fan Zhang (now at Central University of Finance and Economics)

Center Members

(now as the PI of Key Laboratory of Big Data Mining and Knowledge Management in BUPT)

- ✧ Prof. Hui-Jia Li, PI of the Center
- ✧ Dr. Xinjian Zhuo (now Associate Professor at Beijing University of Posts and Telecommunications)
- ✧ Mr. Tianping Shuai (now Associate Professor at Beijing University of Posts and Telecommunications)

- ✧ Dr. Wenze Xu (now Assistant Professor at Beijing University of Posts and Telecommunications)
- ✧ Dr. Hui Tong (now Assistant Professor at Beijing University of Posts and Telecommunications)
- ✧ Dr. Haochen Li (now Assistant Professor at Beijing University of Posts and Telecommunications)