

Xiangnan Feng

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Complexity Science Hub Vienna

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RESEARCH INTERESTS

Computational Social Science, Complex Network, Machine Learning, Data Mining, Statistical Physics

BACKGROUNDS & EXPERIENCES

Postdoc in Complexity Science Hub, Vienna 04/2023 - 03/2025 (Expected)

- **Research Topic:** Science of Cities, Computational Social Science
- **Advisors:** Frank Neffke

Postdoc in Max Planck Institute for Human Development, Berlin 01/2021 - 12/2022 (Expected)

- **Research Topic:** Future of Work, Computational Social Science
- **Advisors:** Iyad Rahwan (Professor), Alex Rutherford (Senior Research Scientist)

Visiting Ph.D. Student in Mathematics, City, University of London, London 04/2019 - 08/2020

- **Research Topic:** Temporal Networks, Spatial Networks, Human Mobility
- **Advisors:** Andrea Baronchelli (Reader)

Ph.D. in Mathematics, Beihang University (BUAA), Beijing 09/2014 - 01/2021

- **Thesis Topic:** Complex Systems, Statistics
- **Advisors:** Zhiming Zheng (Academician of Chinese Academy of Sciences), Wei Wei (Associate Professor)

B.S. in Mathematics, Beihang University (BUAA), Beijing 09/2010 - 07/2014

- **Hua Luogeng Class:** Founded by Beihang University and Chinese Academy of Sciences jointly
- **GPA:** 3.6/4.0

ACADEMIC TOPICS

Future of Work 2020 - Present

- Research on occupation data by statistical learning and complex networks
- Predict the evolution of occupations in the future

Modelling and Optimising Share Bicycle Systems 2019 - Present

- Research on London sharing bicycle system to model and predict the flows
- Model geo-information data by spatial-temporal networks

Graph Neural Networks 2019 - Present

- Research on graph neural networks for tasks like link prediction and classification
- Combine graph neural networks with Motifs for optimization

Minimum Vertex Cover Problem 2018 - 2020

- Research on minimum vertex cover problem, one of the NP-hard problems in graph theory
- Build Core Influence method based on statistical physics
- Build König-Egervary Layer-Subgraph method for minimum vertex-cover optimization

Game Theory on Networks 2019 - Present

- Research on game theory on networks with dynamic strategies

Structure Heterogeneity on Networks	2017 - 2018
<ul style="list-style-type: none"> • Research on network heterogeneity by information theory • Design centrality for Motifs 	
Neuron Network with Stochastic Weight	2017 - 2018
<ul style="list-style-type: none"> • Research on neural network based framework with stochastic weights (SWNNs) • Use SWNNs for parameters estimation in Stochastic 	
Multi-Solution Problem in Particle Physics	2015
<ul style="list-style-type: none"> • Fit BESIII data by $e^+e^- \rightarrow h_c\pi^+\pi^-$ and $\chi_{c0}\omega$ • Derive the formula mathematically for multi-solution situation in Breit-Wigner function fitting 	
Kernel Density Estimation	2014
<i>Graduation Project</i>	
<ul style="list-style-type: none"> • Research bandwidth selection algorithms for kernel density estimation 	

PUBLICATIONS & MANUSCRIPTS

Representation learning of enhanced graphs using random walk graph convolutional network	2023
Xing Li, Wei Wei, Ruizhi Zhang, Zhenyu Shi, Zhiming Zheng, Xiangnan Feng	
<i>ACM Transactions on Intelligent Systems and Technology</i> 2023 Feb 10	
Enhance ambiguous community structure via multi-strategy community related link prediction method with evolutionary process	Under Review
Qiming Yang, Wei Wei, Ruizhi Zhang, Bowen Pang, Xiangnan Feng	
<i>arXiv:2204.13301</i>	
The dynamic resilience of urban labour networks	Under Review
Xiangnan Feng , Alex Rutherford	
<i>arXiv:2202.12856</i>	
Graphical representation and hierarchical decomposition mechanism for vertex-cover solution space	Under Review
Wei Wei, Xiangnan Feng , Xue Liu, Zhiming Zheng	
<i>arXiv:1912.08559</i>	
Abstract: Shaping and Predicting the Urban Labor Markets	2021
Xiangnan Feng , Manuel Cebrian, Alex Rutherford	
<i>the 10th International Conference on Complex Networks and Their Applications</i> , Madrid, Spain	
Representation learning of graphs using graph convolutional multilayer networks based on Motifs	2021
Xing Li, Wei Wei, Xiangnan Feng , Xue Liu, Zhiming Zheng	
<i>Neurocomputing</i> , 2021, ISSN 0925-2312	
Effects of dynamic-Win-Stay-Lose-Learn model with voluntary participation in social dilemma	2021
Zhenyu Shi, Wei Wei, Xiangnan Feng , Ruizhi Zhang, Zhiming Zheng	
<i>Chaos, Solitons & Fractals</i> , Volume 151, 2021, 111269, ISSN 0960-0779	
Graph classification based on skeleton and component features	2021
Xue Liu, Wei Wei, Xiangnan Feng , Xiaobo Cao, Dan Sun	
<i>Knowledge-Based Systems</i> , Volume 228, 2021, 107301, ISSN 0950-7051	
Research of Motif-based similarity for link prediction problem	2021
Chao Li, Wei Wei, Xiangnan Feng , Jiaomin Liu	
<i>IEEE Access</i> , vol. 9, pp. 66636-66645, 2021	

Dynamic aspiration based on Win-Stay-Lose-Learn rule in spatial prisoner's dilemma game Zhenyu Shi, Wei Wei, Xiangnan Feng , Xing Li, Zhiming Zheng <i>Plos one</i> , 16(1), e0244814.	2021
A vertex-cover algorithm of edge-adding process by solution space evolution Wei Wei, Xiangnan Feng , Jiannan Wang, Yanmei Jiang, Yunge Bai, Zhiming Zheng	On Draft
Neural network based stochastic generator: a primary exploration Xiangnan Feng , Xueshuang Xiang, Xuejiao Liu, Yang Ming, Wei Wei	On Draft
Core influence mechanism on vertex-cover problem through leaf-removal-core breaking Xiangnan Feng , Wei Wei, Xing Li, Zhiming Zheng <i>Journal of Statistical Mechanics: Theory and Experiment</i> , 2019.7 (2019): 073401	2019
Research on centralities based on von Neumann entropy for motifs Xiangnan Feng , Wei Wei, Zhiming Zheng <i>2019 International Conference on Artificial Intelligence and Computing Science</i>	2019
Exploring the heterogeneity for node importance by von Neumann entropy Xiangnan Feng , Wei Wei, Renquan Zhang, Jiannan Wang, Ying Shi, Zhiming Zheng <i>Physica A: Statistical Mechanics and its Applications</i> , Volume 517, 1 March 2019, Pages 53-65	2018
Optimal stabilization of boolean networks through collective influence Jiannan Wang, Sen Pei, Wei Wei, Xiangnan Feng , Zhiming Zheng <i>Physical Review E</i> , 97, 032305 – Published 13 March 2018	2018
Correlation research of centralities on complex network by statistical learning Ying Shi, Wei Wei, Xiangnan Feng , Zhiming Zheng <i>2018 2nd International Conference on Artificial Intelligence and Software Engineering</i>	2018
Identifying influential vertices in boolean networks through dynamical voter rank Jiannan Wang, Xiangnan Feng , Zhilong Mi, Ziqiao Yin, Zhiming Zheng <i>2017 IEEE 2nd Information Technology, Networking, Electronic and Automation Control Conference</i>	2017
Combined fit to BESIII data on $e^+e^- \rightarrow h_c\pi^+\pi^-$ and $\chi_{c0}\omega$ Xiangnan Feng , Xuyang Gao, Chengping Shen <i>International Journal of Modern Physics A</i> , 30, 1550142 (2015)	2015
Optimization model for malfunction detection in automatic lathe Zhenfu Wang, Menglun Wang, Sen Chen, Xiangnan Feng <i>Modular Machine Tool & Automatic Manufacturing Technique</i> , 2015, ISSN: 1001-2265 CN: 21-1132/TG	2015
Photovoltaic hut design based on the greedy algorithm Zhenfu Wang, Menglun Wang, Sen Chen, Xiangnan Feng <i>Acta Energiae Solaris Sinica</i> , 2013 Vol. 34 (10): 1775-1780	2013

ACTIVITIES

Conference Talk: The Dynamic Resilience of Urban Labour Networks , Palma de Mallorca <i>Conference on Complex Systems 2022</i>	2022
Conference Talk: Prediction the Future Labour Markets , Berlin <i>CHM Symposium</i>	2021

Conference Talk: Shaping and Predicting the Urban Labor Markets, Madrid 2021
the 10th International Conference on Complex Networks and Their Applications

Seminar: Elements of Statistical Learning, Beihang University 2017-2018
• Organize the seminar of statistical learning as the group leader.

Overwatch Replay Analyzer (ORA) 2017-2018
Developer
• Develop the open-source software to extract a timeline of events from computer game Overwatch videos
• Used by professional Overwatch League E-Sports teams

Manager of Website: “Future Garden”, the Official BBS of Beihang University 2016-2020

Internship in China Academy of Information and Communications Technology 07/2015-12/2015

Teaching Assistant in Calculus, Beihang University 09/2014-01/2015

HONORS & AWARDS

Outstanding Graduate of BUAA 2021
Sponsorship from Academic Excellence Foundation of BUAA for PhD Students (85 among 700) 2019-2020
Outstanding Academic Excellence Scholarship 2012, 2013, 2014, 2015
Meritorious Winner of Mathematical Contest in Modelling 2012

ADDITIONAL INFORMATION

Member of BUAA University Tennis Team 2018, 2020
Member of BUAA University Football Team 2016

REFEREES

Alex Rutherford Postdoc Supervisor, 08/2020 - Present
Senior Research Scientist and Principal Investigator at Max Planck Institute for Human Development
alexisadams@gmail.com

Andrea Baronchelli Visiting Ph.D. Supervisor, 04/2019 - 08/2020
Associate Professor in Mathematics at City, University of London; Token Economy theme lead at The Alan Turing Institute; Research Associate at the UCL Centre for Blockchain Technologies
a.baronchelli.work@gmail.com

Wei Wei Ph.D. Supervisor, 09/2014 - 12/2020
Associate Professor in School of Mathematical Sciences, Beihang University; Director of Department of Data and Information Sciences
weiw@buaa.edu.cn