Xiangnan Feng

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RESEARCH INTERESTS

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

EXPERIENCE

Postdoc in **Max Planck Institute for Human Development**, Berlin, 01/2021 -
- **Research Topic**: Future of Work, Humans and Machines
- **Advisors**: Iyad Rahwan, Alex Rutherford

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

Ph.D. in Mathematics, **Beihang University (BUAA)**, Beijing, 09/2014 - 01/2021
- **Thesis Topic**: Complex Systems, Statistics
- **Advisors**: Zhiming Zheng, Wei Wei

B.S. in Mathematics, **Beihang University (BUAA)**, Beijing, 09/2010 - 07/2014
- **Hua Luogeng Class**: Organized by Beihang University and Chinese Academy of Sciences jointly
- GPA: **3.6/4.0**

ACADEMICS

Activity and Attractiveness on Spatial Networks 2019 - Present
- Studied the patterns of activity and attractiveness on spatial networks.
- Applied to London sharing bicycle systems to verify the conclusions.

Hierarchical Decomposition Mechanism by König-Egérvary Layer-Subgraph 2019 - Present
- Discover phase transition point of the König-Egérvary layer structure on graphs.
- Design an algorithm for minimum vertex cover problems with satisfactory accuracy.

Core Influence Mechanism on Vertex-Cover Problem 2018 - 2019
- Give out a method to break the Leaf-Removal-Core of graphs fast.
- Designed an approximated solution to minimum vertex cover problem.
- Compared to traditional solution, this method could be applied on scale-free graphs.

Heterogeneity Index Based on von Neumann Entropy for Nodes and Motifs 2017 - 2018
- Designed a node heterogeneity index based on information theory.
- Designed a significance index for motifs based on von Neumann entropy.

Neuron Network with Stochastic Weight 2017 - 2018
- Proposed a neural network based framework with stochastic weights (SWNNs).
- Experiments of using SWNNs for parameters estimation in Stochastic are presented.

Multi-Solution Problem in Combined Fit to BESIII Data in Particle Physics 2015
- Programmed to fit BESIII data on $e^+e^- \to h_c\pi^+\pi^-$ and $\chi_{c0}\omega$ with curve.

- Derived the formula mathematically for multi-solution situation in Breit-Wigner function fitting.

Kernel Density Estimation: Bandwidth Selection and Their Comparison 2014
Graduation Project

- Implemented and compared several bandwidth selection algorithms for kernel density estimation.
- Discussed a possible new solution: use Fast Gauss Transform and iteration to calculate bandwidth.

PUBLICATIONS/MANUSCRIPT

Representation Learning of Graphs Using Graph Convolutional Multilayer Networks Based on Motifs 2021
Xing Li, Wei Wei, **Xiangnan Feng**, Xue Liu, Zhiming Zheng
Neurocomputing, 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
Chaos, Solitons & Fractals, 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
Knowledge-Based Systems, 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
IEEE Access, vol. 9, pp. 66636-66645, 2021

Dynamic aspiration based on Win-Stay-Lose-Learn rule in spatial prisoner's dilemma game 2021
Zhenyu Shi, Wei Wei, **Xiangnan Feng**, Xing Li, Zhiming Zheng
Plos one, 16(1), e0244814.

Hierarchical decomposition mechanism by König-Egérvary layer-subgraph with vertex-cover Under Review
Xiangnan Feng, Wei Wei, Xue Liu and Zhiming Zheng

A vertex-cover algorithm of edge-adding process by solution space evolution On Draft
Wei Wei, **Xiangnan Feng**, Jiannan Wang, Yanmei Jiang, Yunge Bai and Zhiming Zheng

Neural network based stochastic generator: a primary exploration On Draft
Xiangnan Feng, Xueshuang Xiang, Xuejiao Liu, Yang Ming and Wei Wei

Core influence mechanism on vertex-cover problem through leaf-removal-core breaking 2019
Xiangnan Feng, Wei Wei, Xing Li and Zhiming Zheng
Journal of Statistical Mechanics: Theory and Experiment, 2019.7 (2019): 073401

Research on centralities based on von Neumann entropy for motifs 2019
Xiangnan Feng, Wei Wei and Zhiming Zheng
2019 International Conference on Artificial Intelligence and Computing Science

Exploring the heterogeneity for node importance by von Neumann entropy 2018
Xiangnan Feng, Wei Wei, Renquan Zhang, Jiannan Wang, Ying Shi and Zhiming Zheng
Physica A: Statistical Mechanics and its Applications, Volume 517, 1 March 2019, Pages 53-65

Optimal stabilization of boolean networks through collective influence 2018
Jiannan Wang, Sen Pei, Wei Wei, **Xiangnan Feng**, and Zhiming Zheng
Physical Review E, 97, 032305 – Published 13 March 2018

Correlation research of centralities on complex network by statistical learning 2018
Ying Shi, Wei Wei, **Xiangnan Feng** and Zhiming Zheng
2018 2nd International Conference on Artificial Intelligence and Software Engineering

Identifying influential vertices in boolean networks through dynamical voter rank 2017
Jiannan Wang, **Xiangnan Feng**, Zhilong Mi, Ziqiao Yin and Zhiming Zheng
2017 IEEE 2nd Information Technology, Networking, Electronic and Automation Control Conference

Combined fit to BESIII data on $e^+e^- \to h_c\pi^+\pi^-$ and $\chi_{c0}\omega$ 2015
Xiangnan Feng, Xuyang Gao and Chengping Shen
International Journal of Modern Physics A, 30, 1550142 (2015)

Optimization model for malfunction detection in automatic lathe 2015
Zhenfu Wang, Menglun Wang, Sen Chen and **Xiangnan Feng**
Modular Machine Tool & Automatic Manufacturing Technique, 2015, ISSN: 1001-2265 CN: 21-1132/TG

Photovoltaic hut design based on the greedy algorithm 2013
Zhenfu Wang, Menglun Wang, Sen Chen and **Xiangnan Feng**
Acta Energiae Solaris Sinica, 2013 Vol. 34 (10): 1775-1780

ACTIVITIES

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

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

Manager of Website: "Future Garden", the Official BBS of Beihang University Since 2016

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

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

Michigan State University & Beihang University Mathematics Summer Camp 07/2013-08/2013
Member *Department of Mathematics, Michigan State University*
- Spent 6 weeks in MSU, took courses given by faculties in the mathematics department.
- Gave a presentation about solving inequality.

Meritorious Winner of Mathematical Contest in Modeling 2012
- Used Genetic Algorithm to calculate the trip schedule on "the big long river".
- Built two models to solve the problem: genetic coding and feedback control.

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
- First prize in Contemporary Undergraduate Mathematical Contest in Modeling, Beijing Zone 2012
- Second prize in the 28th National College Student Physics Competitiom 2011

ADDITIONAL INFORMATION

Programming	Matlab, C/C++, R Language, Python
Software	Mathematica, Latex, Linux, Illustrator, Audition, Photoshop, Gephi
Hobbies	Classical Music, Photography, Astronomy, Football Member of BUAA University Tennis Team (2018, 2020) Member of BUAA University Football Team (2019)