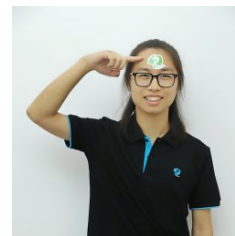


# Zhang Zhang

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Research Interests: Modeling of Complex Systems / Network Science / Deep Learning / Emergence

## Education

Beijing Normal University (Graduate Student)	School of Systems Science	Major: Complex Systems	2019-now
Beijing Normal University (Research Assistant)	School of Systems Science		2018-2019
Hangzhou Dianzi University (Undergraduate)	School of Communication Engineering	Major: Information Security	2013-2017

## Publication List

<b>A General Deep Learning Framework for Network Reconstruction and Dynamics Learning</b> <b>Z Zhang</b> , Y Zhao, J Liu, S Wang, R Tao, R Xin, J Zhang published in 《Applied Network Science》	2019.10
<b>The Cinderella Complex: Word embeddings reveal gender stereotypes in movies and books</b> H Xu, <b>Z Zhang</b> , L Wu, CJ Wang published in 《Plos ONE》	2019.11
<b>An interpretable deep-learning architecture of capsule networks for identifying cell-type gene expression programs from single-cell RNA-sequencing data</b> L Wang, R Nie, Z Yu, R Xin, C Zheng, <b>Z Zhang</b> , J Zhang, J Cai published in 《Nature Machine Intelligence》	2020.11
<b>Automated discovery of interactions and dynamics for large networked dynamical systems</b> Y Zhang, Y Guo, <b>Z Zhang</b> , M Chen, S Wang, J Zhang can be viewd in arxiv	2021.01
<b>Inferring network structure with unobservable nodes from time series data</b> M Chen, Y Zhang, <b>Z Zhang</b> , L Du, S Wang, J Zhang published in 《Chaos》	2022.01
<b>MultiCapsNet: A General Framework for Data Integration and Interpretable Classification</b> L Wang, X Miao, R Nie, <b>Z Zhang</b> , J Zhang, J Cai published in 《Frontiers in genetics》	2021.01
<b>Neural Gene Network Constructor: A neural based model for reconstructing gene regulatory network</b> <b>Z Zhang</b> , L Wang, S Wang, R Tao, J Xiao, M Mou, J Cai, J Zhang can be view in in bioRxiv	2019.01
<b>Research on Intrusion Detection Based on Semantic Re-encoding and Multi-space Projection</b> J Wang, Z Wu, <b>Z Zhang</b> published in 《International Symposium on Cyberspace Safety and Security》	2019.12

## Currently Working On

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### Renormalization Group Technique for Generative Model

Assume we have a group of data points, we believe different scale of the data (like one person or one community in social network) follows different distribution. We use neural network and renormalization group technique to model the distribution of the data in micro scale and macro scale.

### Solving Network Completion Problem with Graph Auto-Encoder

Assume we can only observe part of a network, which means some nodes and edges are missing. In this work we use Graph Auto-Encoder to learn the local connection patterns of the observed part of the network and generalize it to unobserved part to complete the whole network.

## Social Work

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### Second author of the book 《Pytorch and Mechanisms of Deep Learning》

We wrote this book to introduce mechanisms of deep learning and we showed some Pytorch coding examples. I wrote three chapters of this book: Word2Vec, Neural Translation with Encoder-Decoder architecture and Graph Neural Networks. This book can be ordered at <https://item.jd.com/12671722.html>.

### Design a series of short courses to introduce deep learning

I designed 12 short courses to introduce models (such as CNN, RNN, DQN, etc) in deep learning. These courses have been uploaded in one of the largest video sharing website in China and has received more than 40k plays and more than 1k likes. These courses can be watched at <https://www.bilibili.com/video/BV1Hb411G7wy>.

### Write articles to introduce scientific research to the public

I publish articles on the public account of Swarma Club in WeChat to introduce the research progress of complex systems to the public. The topics of these articles include causal emergence, network science, scaling law, etc. Articles are usually read by more than 2k people. A typical article can be read at [https://mp.weixin.qq.com/s/glR-sEFTvyvd-Vio61\\_NPQ](https://mp.weixin.qq.com/s/glR-sEFTvyvd-Vio61_NPQ).

## Experience

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<b>Study in Beijing Normal University</b>	<b>Graduate Student</b>	<b>2019.09-now-</b>
I am currently doing research and learning at Beijing Normal University. My main research interests are using machine learning techniques to model the complex systems automatically. And I'm especially interested in the emergence phenomenon of complex systems.		
<b>Work in Beijing Normal University</b>	<b>Research Assistant</b>	<b>2018.09-2019.09</b>
Because of curiosity, I quit the industry to work as a research assistant at the School of System Science, Beijing Normal University, directed by Professor Zhang Jiang. My main research interests are at the intersection of Network Science and Social Science.		
<b>Work in Shadow Creator (Shanghai)</b>	<b>Leader of Web Front-End Team</b>	<b>2016.07-2018.04</b>
Shadow Creator ( <a href="http://www.shadowcreator.com">http://www.shadowcreator.com</a> ) is a company that designs, produces and sells AR glasses. I lead the Web front-end team at the company and developed web projects such as official website and online mall.		
<b>Intern in Netease (Hangzhou)</b>	<b>Web Front-End Engineer</b>	<b>2016.02-2016.06</b>
I worked as an intern for the 163 mailbox project (one of the largest mail service provider in China), and my main job was to develop web pages and games playing inside the WeChat for marketing.		
<b>Study in Hangzhou Dianzi University (Hangzhou)</b>	<b>Undergraduate</b>	<b>2013-09-2017-06</b>
I was an Undergrad at Hangzhou Dianzi University, and my major was information security. In College, I spent most of my time learning programming skills and working in clubs. I started a programming club and gathered about 30 students interested in programming and held regular sharing sessions. I also led a student organization to organize activities with more than 1000 students participating.		