

# Dongkuan Xu

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## Research Interests

Deep learning, Model Compression, Multi-Task Learning, Explainable Models.  
Applications to Sequence Data, Time Series Data and Network-Structure Data.

## Education

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| <b>The Pennsylvania State University</b><br>Ph.D. in Computer Science, Advisor: Prof. Xiang Zhang   | 2017-2022 |
| <b>University of Chinese Academy of Sciences</b><br>M.S. in Optimization and Data Mining, Advisor: Prof. Yingjie Tian<br>(Exempt from Admission Exam) | 2014-2017 |
| <b>Renmin University of China</b><br>B.E. in Information Management and System, Advisor: Prof. Wei Xu   | 2010-2014 |

## Research Experience

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|---|-----------------|
| <b>The Pennsylvania State University</b> , State College, PA <ul style="list-style-type: none"><li>Graduate Research Assistant, Advisor: Prof. Xiang Zhang</li><li>Deep Models for Learning Temporal Patterns in Dynamic Networks</li></ul> | 08/2017-Present |
| <b>NEC Labs America</b> , Princeton, NJ <ul style="list-style-type: none"><li>Research Intern, Mentor: Dr. Wei Cheng</li><li>Multi-Task Learning via Routing Selection</li><li>Trend Learning in Multivariate Time Series</li></ul>         | 05/2019-12/2019 |
| <b>NEC Labs America</b> , Princeton, NJ <ul style="list-style-type: none"><li>Research Intern, Mentor: Dr. Wei Cheng</li><li>Interpretable RNN Model for Anomaly Precursor Detection</li></ul>  | 05/2018-08/2018 |
| <b>Chinese Academy of Sciences</b> , Beijing, CN <ul style="list-style-type: none"><li>Research Assistant, Advisor: Prof. Yingjie Tian</li><li>Large-Scale Multiple Instance Learning</li></ul>   | 09/2015-06/2017 |
| <b>Key Lab of Big Data Mining and Knowledge Management</b> , Beijing, CN <ul style="list-style-type: none"><li>Research Assistant, Mentor: Prof. Yong Shi</li><li>Clustering Models</li></ul>   | 09/2014-08/2015 |
| <b>Taikang Asset Management Co., Ltd.</b> , Beijing, CN <ul style="list-style-type: none"><li>Research Assistant, Mentor: Dr. Shaolei Shi</li><li>Investment Risk Identification Model</li></ul>  | 11/2013-02/2014 |
| <b>Renmin University of China</b> , Beijing, CN <ul style="list-style-type: none"><li>Research Assistant, Advisor: Prof. Wei Xu</li><li>Ensemble Forecasting Model for Time Series Data</li></ul>   | 09/2012-06/2014 |

## Publications

1. **Dongkuan Xu**, Wei Cheng, Bo Zong, Dongjin Song, Jingchao Ni, Wenchao Yu, Yanchi Liu, Haifeng Chen, Xiang Zhang. Tensorized LSTM with Adaptive Shared Memory for Learning Trends in Multivariate Time Series [C]. *The 34th AAAI International Conference on Artificial Intelligence*. (**AAAI'2020**)
2. Junjie Liang, **Dongkuan Xu**, Yiwei Sun, Vasant Honavar. Longitudinal Multi-Level Factorization Machines [C]. *The 34th AAAI International Conference on Artificial Intelligence*. (**AAAI'2020**)
3. **Dongkuan Xu**, Wei Cheng, Dongsheng Luo, Yameng Gu, Xiao Liu, Jingchao Ni, Bo Zong, Haifeng Chen, Xiang Zhang. Adaptive Neural Network for Node Classification in Dynamic Networks [C]. *The 19th IEEE International Conference on Data Mining*. (**ICDM'2019**)
4. **Dongkuan Xu**, Wei Cheng, Dongsheng Luo, Xiao Liu, Xiang Zhang. Spatio-Temporal Attentive RNN for Node Classification in Temporal Attributed Graphs [C]. *The 19th The 29th International Joint Conference on Artificial Intelligence*. (**IJCAI'2019**)
5. **Dongkuan Xu**, Wei Cheng, Bo Zong, Jingchao Ni, Dongjin Song, Wenchao Yu, Yuncong Chen, Haifeng Chen, Xiang Zhang. Deep Co-Clustering [C]. *The 19th SIAM International Conference on Data Mining*. (**SDM'2019**)
6. Jingchao Ni, Shiyu Chang, Xiao Liu, Wei Cheng, Haifeng Chen, **Dongkuan Xu**, Xiang Zhang. Co-Regularized Deep Multi-Network Embedding[C]. *The 27th International Conference on World Wide Web*. (**WWW'2018**)
7. **Dongkuan Xu**, Wei Zhang, Jia Wu, Yingjie Tian. Multiple Instance Learning Based on Positive Instance Graph[J]. *arXiv preprint arXiv: 1612.03550 (2016)*.
8. Yingjie Tian, **Dongkuan Xu**, Chunhua Zhang. A Review of Multi-Instance Learning Research [J]. *Operations Research Transactions* , 2018, 02: 1-17.
9. **Dongkuan Xu**, Jia Wu, Dewei Li, Yingjie Tian, Xinquan Zhu, Xindong Wu. SALE: Self-Adaptive LSH Encoding for Multi-Instance Learning[J]. *Pattern Recognition*, 2017. (**Pattern Recognition**)
10. Dewei Li, **Dongkuan Xu**, Jingjing Tang, Yingjie Tian. Metric Learning for Multi-Instance Classification with Collapsed Bags[C]. *The 30th IEEE International Joint Conference on Neural Networks*. (**IEEE IJCNN'2017**)
11. **Dongkuan Xu**, Jia Wu, Wei Zhang, Yingjie Tian. PIGMIL: Positive Instance Detection via Graph Updating for Multiple Instance Learning[C]. *arXiv preprint arXiv:1612.03550*, 2016.
12. **Dongkuan Xu**, Yingjie Tian. A Comprehensive Survey of Clustering Algorithms[J]. *Annals of Data Science*, 2015, 2(2): 165-193. (**457 citations**)
13. Dewei Li, Wei Zhang, **Dongkuan Xu**, Yingjie Tian. Multi-Metrics Classification Machine[C]. *International Conference on Information Technology and Quantitative Management*. (**ITQM'2016**) (**Best Paper Award**)
14. **Dongkuan Xu**, Tianjia Chen, Wei Xu. A Support Vector Machine-Based Ensemble Prediction for Crude Oil Price with VECM and STEPMRS[J]. *International Journal of Global Energy Issues*, 2015.
15. **Dongkuan Xu**, Yi Zhang, Cheng Cheng, Wei Xu, Likuan Zhang. A Neural Network-Based Ensemble Prediction Using PMRS and ECM[C]. *The 47th IEEE Hawaii International Conference on System Sciences*. (**HICSS'2014**)

## Teaching Experience

### DS402 - Introduction to Social Media Mining

Instructor: Prof. Suhang Wang

Course Materials: Social Media Mining: An Introduction

## **IST210 - Organization of Data**

Instructor: Prof. Xiang Zhang

Course Materials: Database Systems Concepts

**(The Award for Excellence in Teaching Support)**

## **SRA365 - Statistics for Security and Risk Analysis**

Instructor: Dr. Katherine Hamilton

Course Materials: Theoretical Foundations and Practice of Intermediate Statistics

## **Talks**

### **Learning Trends in Multivariate Time Series**

New York, USA, Feb. 2020.

AAAI'2020

### **Node Classification in Dynamic Networks**

Beijing, China, Nov. 2019.

ICDM'2019

### **Anomaly Precursor Detection via Deep Multi-Instance RNN**

Princeton, USA, May. 2019.

NEC Laboratories America

### **Deep Co-Clustering**

Calgary, Canada, May 2019.

SDM'2019

### **Efficient Multiple Instance Learning**

Princeton, USA, May. 2018.

NEC Laboratories America

## **Professional Services**

### **Program Committee Member:**

AAAI'20, ACM CIKM'20, AACL-IJCNLP'20, IJCAI'20, IJCNN'18, 19, 20

### **External Conference Reviewer:**

AAAI'18, 19, 20, ACM CIKM'18, 19, Big Data'18, ICDM'18, 19, IJCNN'16, 17, ITQM'16, 17, KDD'18, 19, 20, SDM'18, 19, 20, TheWebConf (WWW)'20, WSDM'20

### **Journal Reviewer:**

IEEE Transactions on Cybernetics, ACM Transactions on Knowledge Discovery from Data (TKDD), Pattern Recognition, IEEE Access, Neural Computation, Complexity, Soft Computing, Complex & Intelligent Systems

## **Honors and Awards**

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| AAAI Student Scholarship                                   | 2020 |
| IST Travel Award   | 2020 |
| IST Travel Award   | 2019 |
| College of IST Award for Excellence in Teaching Support    | 2019 |
| President's Fellowship of Chinese Academy of Sciences (1%) | 2016 |

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| National Graduate Scholarship (2%)                                  | 2015 |
| First-class Scholarship of Sashixuan Elite Fund (5%)                | 2014 |
| Kwang-Hua Scholarship of RUC  | 2014 |
| Second-class Scholarship of Excellent Student Cadre                 | 2014 |
| Meritorious Winner in Mathematical Contest in Modeling, USA         | 2013 |
| First-class Scholarship of Social Work and Volunteer Service of RUC | 2013 |

## Extracurricular Activities

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| AAAI (Association for the Advancement of Artificial Intelligence) Student Membership   | 2019-Present |
| SIAM (Society of Industrial and Applied Mathematics) CAS Student Member                | 2016-Present |
| <b>President</b> of Youth Volunteers Association of School of Information of RUC       | 2012-2013    |
| Volunteer of Beijing Volunteer Service Federation (BVF)                                | 2012-Present |
| Leader of National Undergraduate Training Programs for Innovation and Entrepreneurship | 2011-2012    |

## Technical Skills

TensorFlow, Keras, Numpy, Matlab, C, SQL, Latex, OriginLab, SPSS  
Optimization Methods, Machine Learning, Artificial Intelligence, Data Mining