

Mengda Xing

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Education

North China University of Technology

Master of Computer Technology

Beijing, CHINA

Sep 2020 - Jun 2023

- **Beijing Key Laboratory on Integration and Analysis of Large-scale Stream Data**
- **Supervisor:** Prof.Ding Weilong, Prof.Li Han
- **Research Interest:** Deep Learning, Spatio-Temporal Big Data Analysis
- Beijing Key Disciplinary Areas
- Courses: Matrix Analysis, Advanced Mathematical Statistics, Machine Learning and Application, Data Science and Engineering, Graduate English
- GPA: 3.85/4.0; Rank: 6/76

Beijing Institute of Technology

Bachelor of Marketing

Beijing, CHINA

Sep 2010 - Jun 2014

- Double first-class university, Project 985, Project 211
- Courses: Calculus A, Linear Algebra B, Applied Statistics, Computer Fundamentals, College English
- GPA: 3.2/4.0

Publications

[1] **Mengda Xing**, Weilong Ding, Tianpu Zhang, Han Li. ASTGCN: An Attention-Based Spatio-temporal Graph Convolutional Network for Remaining Useful Life Prediction of Power Transformer. International Journal of Web Information Systems (IJWIS), 2023 [Under review]

- Using a variant of STGCN, spatio-temporal features are learned from the combination of attention, TCN and GCN. we propose a novel multi-branch structure to efficiently compute feature maps from two heterogeneous data sources, and a novel similarity aggregation method to compute the spatial Uncertain Adjacency Matrix (UAM) within the complete graph.

[2] **Xing M**, Ding W, Li H, et al. A Power Transformer Fault Prediction Method through Temporal Convolutional Network on Dissolved Gas Chromatography Data[J]. Security and Communication Networks, 2022, 2022.

- Using a variant of TCN named MSTCN, we proposed a new power transformer fault prediction method through MSTCN. The method has three main steps: (1) missing imputation and outlier detection; (2) Dissolved gas prediction using MSTCN; (3) Fault classification.

Conferences

[1] Yang Y, Yang L, **Xing M**. MRNN-SA: A Multi-dimensional Time Series Fault Prediction Service for Power Equipment through Self-attention Network[C]//2022 International Conference on Service Science (ICSS). IEEE, 2022: 209-216

- Using a variant of RNN named MRNN-SA, we proposed a multi-dimensional time series fault prediction service. First, the branches learns independently from the data of different scales. Then, the influence of irrelevant data is excluded by self-attention module. Finally, three branches is fused by layers of MLP.

[2] Weilong Ding, Tianpu Zhang, **Mengda Xing**. Attention-based Dynamic Graph Convolutional Recurrent Neural Network for Traffic Flow Prediction in Highway Transportation. The Web Conference 2023: International World Wide Web Conference (WWW), 2023 [Under review]

- Using a variant of STGCN, spatio-temporal features are learned from the combination of Attention, GRU and GCN. A novel dynamic graph cell is introduced to deal with static graph and multi-dynamic graphs of temporal resolutions of current, day and week.

[3] Zijian Liu, Weilong Ding, **Mengda Xing**, Han Li. Conv-WGAIN: Convolutional Generative Adversarial Imputation Nets for Multivariate Time Series Missing Data. International Conference on Machine Learning for Networking (MLN), 2023 [Under review]

- Based on Generative Adversarial Imputation Nets (GAIN), Conv-WGAIN is proposed. The Wasserstein Distance is introduced in the discriminator for solving collapse mode problem.

[4] Zhang T, Ding W, **Xing M**, et al. Geographic and Temporal Deep Learning Method for Traffic Flow Prediction in Highway Network[C]//International Conference on Collaborative Computing: Networking, Applications and Worksharing. Springer, Cham, 2021: 385-400.

- Using a variant model of GCN and LSTM, we propose a method that can capture geographic spatial relationship among toll stations, the dynamic temporal relationship of historical traffic flow, extreme weather and calendar type.

Personal Profile

A Master's student at the North China University of Technology, undertaking the Data Science and Machine Learning courses. Zealous about deep learning. With 2+ years of experience specialising in deep learning / python development / algorithms, and 5+ years industry experience of full-stack web development. Primarily, looking for a PhD position of big data analysis / time series analysis / deep learning.

Industry Experience

Wind Mobility

Beijing, CHINA

Web Developer

Dec 2018 - Jul 2019

- Wind Mobility is a shared scooter company, and my main responsibility is server side.
- The back-end base framework is koa.js, which completely uses async/await to do asynchronous development and implements framework functions through middleware mode.

Shimo Docs

Beijing, CHINA

Web Developer

Jun 2018 - Dec 2018

- Shimo Docs' main product is online document, I am engaged in developing main site document service, responsible for 3 functions: AB Test; switch service; underline comment.
- AB Test group users and provide different goods or services through switch service, and collect data through Sensors Data to do significance test to verify whether the new feature is effective. The switch service is also used for canary release.

Laiye

Beijing, CHINA

Web Developer

Sep 2018 - Jun 2018

- The main product of Laiye is an intelligent automation platform, and my main responsibility is to develop the data middle layer.
- The data middle layer is implemented by GraphQL, the graph structure data has limitations using restful style interface, and GraphQL can solve this problem very well.

Mobile Future

Beijing, CHINA

Web Developer

Sep 2014 - Jan 2018

- Leyouke is a new retail ERP software. I am responsible for the cashier system and cloud backend development. The cashier system uses npm+electron to realize the desktop client, which controls each module of the cashier through the serial port. The cloud backend uses sea.js framework to provide membership services in saas mode.

University Projects

Data Anomaly Detection and Data Cleaning for IoTs and Data Hubs

Beijing, CHINA

Smart Grid Research Institute Technology Project, State Grid

Feb 2021 - Oct 2022

- Analysing data from 2007 to 2018 and discover patterns in the data that show trends from residential electricity consumption, transformer power, chromatograph online monitoring of transformer oil, transformer core data.
- Using improved models based on TCN, RNN, GCN, and Transformer, Predict faults and remaining useful life (RUL) from chromatograph data
- Using improved models based on Generative Adversarial Imputation Nets (GAIN), make imputation for multivariate time series missing data
- **Technical Skills:** Python, PyTorch, Numpy, Matplotlib, Paper Writing in \LaTeX .
- **Soft Skills:** Superset, MySQL, Teamwork.

Skills

Programming Python (PyTorch, Pandas, NumPy, Scikit-learn. etc.), Node.js, HTML/CSS/JavaScript, MySQL, Redis

Miscellaneous Linux, Shell (Bash/Zsh), \LaTeX (Overleaf), Markdown, Superset, Git, Github/Gitlab, Docker

Rewards / Honors

- The First Prize Scholarship of North China University of Technology (2021) (2022)
- North China University of Technology Outstanding Graduate Student (2022)
- The Second Prize of the Sixth Academic Forum of North China University of Technology (2022)
- The First Prize of Blue Bridge Cup Provincial Competition (2022)

Languages

English IELTS 6.5, CET-6 493

Chinese Native proficiency

References available upon request.