Zheng Dong

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Department of Computer Science and Engineering
Southern University of Science and Technology (SUSTech)
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Google Scholar: [link] **GitHub**: github.com/XDZhelheim

Research Interests

Deep Learning, Multivariate Time Series,
Spatial-Temporal Data Mining, Urban Computing

Education

Southern University of Science and Technology Shenzhen, China
M.S. student in *Electronic Science and Technology* Sept. 2022 – Present
Supervisor: Prof. Renhe Jiang, Prof. Xuan Song GPA: 3.45/4.00

Southern University of Science and Technology Shenzhen, China
B.E. in *Computer Science and Technology* Sept. 2018 – July 2022
Supervisor: Dr. Quanjun Chen, Prof. Xuan Song GPA: 3.79/4.00

Publications

Notations: *Equal Contribution, †Corresponding Author

[5] **Zheng Dong***, Renhe Jiang*, Haotian Gao, Hangchen Liu, Jinliang Deng, Qingsong Wen, and Xuan Song†. 2024. Heterogeneity-Informed Meta-Parameter Learning for Spatiotemporal Time Series Forecasting. *In Proceedings of the 30th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD).*

[4] Haotian Gao, Renhe Jiang†, **Zheng Dong**, Jinliang Deng, Yuxin Ma, and Xuan Song. 2024. Spatial-Temporal-Decoupled Masked Pre-training for Spatiotemporal Forecasting. *In Proc. of the 33rd International Joint Conference on Artificial Intelligence (IJCAI).*

[3] Hangchen Liu*, **Zheng Dong***, Renhe Jiang†, Jiewen Deng, Jinliang Deng, Quanjun Chen, and Xuan Song†. 2023. STAEformer: Spatio-Temporal Adaptive Embedding Makes Vanilla Transformer SOTA for Traffic Forecasting. *In Proceedings of the 32nd ACM International Conference on Information and Knowledge Management (CIKM).*

[2] Huanchen Wang*, Quanjun Chen*, **Zheng Dong**, Xuan Song, Hao Tian, Donglong Yang, and Manxia Liu. 2022. A Geomagnetic Sensor Dataset for Traffic Flow Prediction. *In Proceedings of 2022 IEEE International Conference on Big Data (BigData).*

[1] **Zheng Dong**, Quanjun Chen†, Renhe Jiang†, Huanchen Wang, Xuan Song, and Hao Tian. 2022. Learning Latent Road Correlations from Trajectories. *In Proceedings of 2022 IEEE International Conference on Big Data (BigData).*

Honors and Scholarships

SUSTech Outstanding Student Teaching Assistant	Jan. 2024
HUAWEI AI Education Base Scholarship	Apr. 2023
SUSTech Merit Student Scholarship	Nov. 2021
SUSTech Merit Student Scholarship	Nov. 2020

Research Experience

SUSTech-UTokyo Joint Research Center on Super Smart Cities

Postgraduate Researcher Sept. 2022 – Present

Research Topics: Spatiotemporal Forecasting, Spatiotemporal Heterogeneity

- **Torch-MTS**: github.com/XDZhelheim/Torch-MTS
  A simple PyTorch benchmark platform for multivariate time series forecasting. It supports 17 popular datasets and 24 forecasting models in the latest version.
- **STAEformer** [3]: github.com/XDZhelheim/STAEformer | arXiv:2308.10425
  A simple yet effective baseline for spatiotemporal forecasting. The proposed novel Spatio-Temporal Adaptive Embedding (STAE) can effectively capture the inherent spatiotemporal relations, achieving SOTA performance with vanilla Transformer layers. Paper published in CIKM 2023.
- **HimNet** [5]: github.com/XDZhelheim/HimNet | arXiv:2405.10800
  Proposes a novel Heterogeneity-Informed Meta-Parameter Learning scheme. It not only cptures but explicitly leverages the spatiotemporal heterogeneity to dynamically learn model parameters on each input, thus enhancing the adaptability. The forecasting model HimNet achieves SOTA performance while exhibiting superior interpretability. Paper published in KDD 2024.

Undergraduate Researcher Sept. 2020 – Aug. 2022

Research Topics: GPS Trajectory Data Analysis and Visualization

- [1]: Proposes a novel trajectory-based road network representation learning framework. It learns dynamic route choice through trajectories to build a latent correlation graph for traffic-related applications. Paper published in IEEE BigData 2022.

Teaching Experience

Department of Computer Science and Engineering, SUSTech

Teaching Assistant

CS305: Computer Network	Fall 2023
CS305: Computer Network	Spring 2023
CS109: Introduction to Computer Programming	Fall 2022
CS307: Principles of Database Systems	Spring 2022
CS305: Computer Network	Fall 2021

Skills

Programming

Proficient in: Python deep learning (PyTorch/Numpy/Matplotlib)

Other skills: Linux, Git, LaTeX, Java, C++

Languages

Chinese (native), English (CET-4: 604, CET-6: 626)