Nan Jiang

Beijing University of Posts and Telecommunications(BUPT), China

Supervisor: Shangguang Wang (**Associate Dean**, School of CS)
Lab: State Key Laboratory of Networking and Switching Technology
Major: Computer Science and Technology (**Double First Class**)

+86-15901380807
jn_work@outlook.com
jn_bupt@bupt.edu.cn

Education

•Beijing University of Posts and Telecommunications(BUPT), China *9/2022-6/2025*
Graduate Student - Computer Science and Technology CGPA: 90.52/100

•Beijing University of Posts and Telecommunications(BUPT), China *9/2018-6/2022*
Bachelor's Degree - Computer Science and Technology CGPA: 3.49/4

Publications

- ***Nan Jiang**, Haitao Yuan, Jianing Si, Minxiao Chen and Shangguang Wang, "Towards Effective Next POI Prediction: Spatial and Semantic Augmentation with Remote Sensing Data"* ***accepted*** *by* ***ICDE 2024 (40th IEEE International Conference on Data Engineering)****. https://arxiv.org/abs/2404.04271*
- *Zhengyang Zhao, Haitao Yuan,* ***Nan Jiang****, Minxiao Chen, and Shangguang Wang, "STMGF: An Effective Spatial-Temporal Multi-Granularity Framework for Traffic Forecasting"* ***accepted*** *by* ***DASFAA 2024****. https://arxiv.org/abs/2404.05774*

Research

•Exploring the Potential of Large Language Models on Data Mining tasks *10/2023-present*
Under the supervision of Haitao Yuan, research fellow of NTU. On-going research NTU, Singapore

- Design a framework to endow Large Language Models (LLMs) with spatial awareness. Further testify it with Point-of-Interests(POIs) tasks.
- Leverage GNNs with Reinforcement Learning to create a more efficient prompt generator for LLMs.
- Introduce a LoRA-like spatial fine-tuning attention network for LLMs, intending to endow transformer layers with spatial attentions.

•Exploring Lorenz Space for Improved Trajectory Similarity Matching *12/2023-present*
Participated On-going research. Working on experiments and paper composation. BUPT, Beijing, China

- Introduced the Lorenz space into trajectory similarity matching tasks to overcome limitations arising from the triangle inequality constraints in traditional Euclidean geometric spaces, with partial effects validated in experiments.
- Participated in the derivation of formulas and experimental testing work.

•AI Spatio-Temporal Big Data Research for Satellite-Earth Scenario *6/2022-12/2023*
Under the supervision of Haitao Yuan, research fellow of NTU. ***Paper accepted by ICDE 2024.*** NTU, Singapore

- Introduced a spatial-semantic separated two-step prediction model for the next point-of-interests(POI) recommendation problem that can Incorporate multi-modal data from Satellite-Earth scenario.
- Proposed an innovative method that incorporates Remote Sensing Imagery to augment environmental aspects to urban region representation.
- Developed a novel spatial graph construction approach that integrates quad-tree with POI distribution, providing an innovative strategy for user historical chech-in knowledge learning.

•Spatial-Temporal Multi-Granularity Model for Traffic Flow Prediction *6/2022-10/2023*
Participated research. ***Paper accepted by DASFAA 2024.*** BUPT, Beijing, China

- Utilized graph hierarchical clustering to obtain multi-granularity traffic networks, enabling a structured representation of traffic signals at various spatial granularities.
- Employed a temporal multi-granularity approach to derive prediction results at different temporal granularities.
- Introduced a historical period data matching method leveraging the periodicity of traffic sequences to refine.

•Representation Learning For Trajectory Similarity Measurement *10/2022-12/2023*
Participated research. ***Paper waiting for submission.*** BUPT, Beijing, China

- Designed a method for aligning trajectory space and similarity space with consideration for efficiency.
- Implemented a knowledge distillation model that distills the representation of dual-trajectory similarity into a single-trajectory embedding generation model, synthesizing the efficiency and accuracy advantages of both models.
- Mainly Participated in the experimental testing and paper composition.

•Versatile Framework for Urban Traffic Accident Risk *9/2022-11/2023*
Participated research. ***Paper submitted to TKDE.*** BUPT, Beijing, China

– Utilised remote sensing images to reveal regional backgrounds which indicate similar traffic accident patterns.
– Create a spatio-temporal griding method along with multi-level semantic similarity graph to inherently consider both spatial and semantic aspects on multi-granularity
– Mainly Participated in the idea construction and paper composition.

•Research on Large Scale Graph Neural Network Pre-training *2/2022-6/2022*

*Under the supervision of the **Prof. Chuan Shi, BUPT**. Bachelor's Thesis* BUPT, Beijing, China

– Studied the implementation of graph neural networks, conducted research on their advancements, and compared various graph pre-training methods.
– Developed a pre-training task based on min-cut algorithms and masked mechanism to address the issue of insufficient labeling in graph data.
– Designed a fast minimum cut algorithm based on the Stoer-Wagner algorithm, utilizing matrix operations to enhance the efficiency of data preprocessing for graph minimum cut computation.
– Implemented a pre-training method with node-level self-supervised training and graph-level supervised training two-step architecture.

Internship Experience

•VMware, Inc *5/2022-8/2022*

Software Engineer (Intern) Beijing, China

– Developed a solution to resolve audio stuttering issues of the virtual machine front-end program on macOS, greatly enhancing the user audio playback experience.
– Acquired proficiency in the company's front-end development framework(Angular) and implemented the use of the Opus audio decoder to standardize front-end audio decoding strategies
– Participated in the development team for the virtual machine front-end program and assisted in resolving a critical issue in the client application.

Activities and Responsibility

•Graduation Project Guidance *12/2022-6/2023*

– Assisted senior undergraduate students in researching graduation project. Topics related to Spatial-Temporal big data of Satellite-Earth scenario.
– Facilitated the design of deep learning models and provided guidance in conducting experiments and writing research papers.

•Graduate Entrance Examination Experience Lecturer *4/2023*

– Invited by faculty members of the graduate group to share my experience with undergraduate students regarding graduate examinations.
– Provided explanations of study materials and shared relevant resources to undergraduate students, while also guiding them in developing effective revision plans.

•School Skateboard Club Vice President *5/2020-4/2021*

– Organized fellowship, garden party and other community activities.
– Managed funds and planned community development.

Awards and Honors

•"Internet+" College Student Innovation and Entrepreneurship Competition Award *8/2023*

Won the first prize in the Higher Education Main Track of the Beijing Division Semi-finals of the 9th China International 'Internet+' College Students Innovation and Entrepreneurship Competition. Also won the first Prize in the Beijing University of Posts and Telecommunications Competition Area.

•BUPT First-Class Scholarship *11/2023*

Awarded for outstanding academic performance and moral acts during the academic year of post-graduate study.

•Huawei Developer Competition Award *11/2022*

Participated in the code challenge for space development, led a team in designing and implementing a cloud-native satellite computing platform visualization monitoring project, and won the third prize.

•NXP Cup Intelligent Car Competition Award *6/2019*

Participated in Outdoor Electromagnetic Group's competition and received awards in the university competition and won the third prize in the North China regional competition.

Technical Skills

Language: English(CET 6, IELTS 7.5)

Computer Skills: Python, C, C++, Javascript, Linux, Sql, Java, MATLAB

Develop Tools: Pycharm, Jupyter notebook, Visual Studio, VScode, MySql

Software Skills: Visio, Latex, Photoshop, Premiere Pro