Guanlue Li

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Personal Profile

- I'm a research assistant at Data Science and Analytics Thrust, The Hong Kong University of Science and Technology (Guangzhou), supervised by Prof. Jia Li. I received my Master's degree from Beijing University of Posts and Telecommunications, supervised by Prof. Jinlin Li.
- **Research Interests:** Graph Neural Networks, Drug Discovery, Data Mining, AI for Science, Internet of Vehicles, Multi-Agent System Decision Making

Academic Experience

The Hong Kong University of Science and Technology (Guangzhou) *Jun. 2022 – Present*
Research Assistant Advisor: Jia Li

Beijing University of Posts and Telecommunications *Sep. 2019 – Jun 2022*
Master in Computer Technology (GPA: 3.38/4.00) Advisor: Jinlin Li

Southwest Jiaotong University *Sep. 2015 – Jun 2019*
Bachelor in Communication Engineering (GPA: 3.68/4.00 Top 5 %)

Related Courses: Data Warehouse & Data Mining (93) Digital Image Processing (92) Signal and System A (99)
Data Structure (96) Advanced Program Course Design (97) Digital Electronic Technique A (96)

Publication/Preprint

Guanlue Li, Guiyang Luo, Quan Yuan, Jinlin Li. Trajectory Prediction with Heterogeneous Graph Neural Network. PRICAI 2022: Trends in Artificial Intelligence, 375–387

Weiqi Zhang*, **Guanlue Li***, Jianheng Tang, Jia Li, Fugee Tsung. Missing Data Imputation with Graph Laplacian Pyramid Network. (Under Review)

Projects

Geometric and Graph Deep Learning for Drug Binding Structure Prediction *Jun. 2022 – Present*
Researcher Advisor: Jia Li

- Used Hyperspherical Variational Auto-encoder to model the interaction of molecules and proteins
- Designed a pooling operator for 3D structures and investigate the hierarchical representation of proteins
- During inference, generate translation, rotation and torsion rotation of molecules and update position iteratively
- Designed the encoder and decoder based on equivariant graph neural networks

Trajectory Prediction with Heterogeneous Graph Neural Network *Oct. 2020 – July. 2021*
Researcher Advisor: Jinglin Li

- Developed a trajectory prediction system to model interactions between mobile agents
- Achieved multi-modal destination prediction by VAE to generate more diverse and plausible trajectories
- Investigated the interactions between different types of mobile agents by heterogeneous transformer graph network
- Improved the calculation efficiency by distributed computing and increased the trajectory accuracy by 5.8 %

Framework for Multi-agent Trajectory Tracking, Smoothing and Forecasting *May. 2020 – Sep. 2020*
Researcher Advisor: Jinglin Li

- For tracking, utilized attention mechanism to encode spatiotemporal dependencies of agents; added occlusion state during the attention association process to reason about occlusion agents
- For smoothing, used Kalman Filter to reduce data noise and provide more accurate vehicle trajectories
- For forecasting, used LSTM to predict trajectories and utilized social pool to learn interactions among agents

Q-Learning Path Planning for Multi-Agent System in Traffic Networks *Nov. 2018 – May. 2019*
Researcher Advisor: Jinglin Li

- Maintained global and local Q-table to overcome the drawbacks of sub-optimal convergence and unstable Q-value
- Used Q-learning to update Q value of actions; let mobile agents submit traffic conditions to reduce congestion

- Tested how different scales of traffic, parameters, learning rate and greedy rate affect the model ability

Social Network Articles Crawl and Text Classification Based on Naive Bayes *Nov. 2019 – Dec. 2019*
Team leader

- Cracked the interface parameters required for ajax dynamic loading
- Classified crawled articles by Naive Bayesian algorithm and used the TFIDF algorithm feature selection
- Built an online system that takes raw texts as queries and returns classification results with almost 90 % accuracy

Internship

Users Data Analysis *Jul. 2018 – Aug. 2018*
Guoxinan Base Chengdu, China

- Built an online system that analyzes user's data and shows users' portraits; used Django to build projects
- Used HTML, CSS, JavaScript to visualize user portraits and analysis results; utilized Ajax to update web pages dynamically.

Technical Skills

Languages: Python, Matlab, C++, HTML/CSS
Plarforms/Tools: Pytorch, Deep Graph Library, Linux, OpenCV
English Capability: IELTS 6.5