

YIXUAN LI

☎ +86 19805182212 ✉ yixuanli@seu.edu.cn 🏠 <https://liyix.github.io>

Education

Southeast University

Master of Computer Science, GPA: 86.38

Advisor: Prof. Wanyuan Wang

Sep. 2022 – Jun. 2025

Nanjing, China

Nanjing University of Posts and Telecommunications

Bachelor of Computer Science, GPA: 86.36

Advisor: Dr. Kang Xu

Sep. 2018 – Jun. 2022

Nanjing, China

Research Interests

Artificial Intelligence; Reinforcement Learning; Operation Research; Multi-Agent Systems

My research outputs now include 5 publications accepted, 2 pending submissions, and one granted patent.

Publications

- Factor Graph Neural Network Meets Max-Sum: A Real-Time Route Planning Algorithm for Massive-Scale Trips**, Proceedings of the 23rd International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS'24)
Yixuan Li, Wanyuan Wang, Weiye Xu, Yanchen Deng, Weiwei Wu.*
 - Designed a novel modeling approach: the Path-Query Factor Graph for global route planning problems;
 - Proposed a hybrid pruning technique to accelerate Max-Sum algorithm in different traffic conditions;
 - Developed an end-to-end, real-time response framework based on the factor graph neural networks.
- Decentralized Subgoal Tree Search for Multi-agent Planning without Priors or Communication**, Proceedings of the 19th International Conference on Mobility, Sensing and Networking (MSN'23)
Qian Che, Yixuan Li, Ziyao Peng, Wanyuan Wang, Yichuan Jiang.*
 - Improved distributed tree search algorithm by upstream planning to automatically extract sub-goals;
 - Introduced an expectation alignment technique to extend algorithm to non-communication scenarios.
- A Multi-agent Based Method for Large-Scale Route Planning Using Distributed Constraint Optimization**, The 6th IEEE International Conference on Unmanned Systems (ICUS'23)
Yixuan Li, Qian Che, Fengchen Wang, Yifeng Zhou, Chuanyou Li, Wanyuan Wang.*
 - Modeled the large-scale path planning problems as Distributed Constraint Optimization Problems.
- Explicit Coordination Based Multi-Agent Reinforcement Learning for Intelligent Traffic Signal Control**, The 18th CCF Conference on Computer Supported Cooperative Work and Social Computing
Yixuan Li, Qian Che, Yifeng Zhou, Wanyuan Wang, Yichuan Jiang.*
 - Enhanced inter-agent information sharing by predicting traffic flow and neighboring traffic light phases.
- A Method for Security Traffic Patrolling Based on Structural Coordinated Proximal Policy Optimization**, The 18th CCF Conference on Computer Supported Cooperative Work and Social Computing
Yixuan Li, Qian Che, Fengchen Wang, Huiying Zhang, Wanyuan Wang, Yichuan Jiang.*
 - Designed an efficient Shapley value decomposition method for reward function by local relationship.
- A Method for Fault Root Cause Localization Based on Network Topology and Real-Time Alarms**, China Invention Patent No. CN112181758B, Granted on 2023.
Kang Xu, Yixuan Li, Haiqi Liu, Xiaowei Zhang, Ning Ye, Ruchuan Wang.
 - Devised a framework for root cause identification based on alarm nodes and their hierarchical topology.

Works in Progress

1. **A Fast RL Based Solution Search Method for Mixed Integer Programming.** To be submitted to The 39th Annual AAAI Conference on Artificial Intelligence (*AAAI'25*).
 - Designed a rapid reduction and approximation solution method for MIP problems based on RL.
 - Proposed a feasible solution repair scheme based on the diffusion model.
2. **Multiagent-Based Self-Organized Resource Allocation in Cloud Computing Systems.** To be submitted to IEEE Internet of Things Journal.
Qian Che, Yixuan Li, Weiyi Xu, Haoran Chen, Yifeng Zhou*.*
 - Developed a novel multiagent modeling approach by representing traffic demand as agents.
 - Designed an attention-based pointer network to enhance feature extraction.

Research Projects

Accelerating Large-Scale Supply Chain Problem Solving

Jan. 2023 – Jul. 2023

Huawei Technologies Co., Ltd.

Shenzhen, China

- Developed a solver acceleration method based on problem reduction for large-scale (integer) linear programming, predicted integers and identified active constraints to reduce the number of redundant constraints for a rapid solution.
- Reduced solution time to milliseconds on Huawei's real-world supply chain scheduling scenarios while ensuring 99% fidelity.
- By integrating the solver's warm start technology, achieved over ten times speed improvement on average compared to CPLEX under the same solution gap, winning the Huawei Spark Award.

Optimization of Data Center Cooling System

Sep. 2022 – Dec. 2023

China Mobile Communications Group Co., Ltd

Wuxi, China

- Trained a thermodynamic model of the cooling system using GNN and the relationship of the units.
- Designed a DRL-based control algorithm for data center cooling systems by DDPG combined with imitation learning.
- Test results showed a total power usage effectiveness (PUE) reduction of 35% compared to the original scheme, successfully deployed at the China Mobile Wuxi Data Center.

Intelligent Anomaly Detection and Root Cause Localization

Jun. 2020 – Jun. 2022

State Key Laboratory of Smart Grid Protection and Control, NARI Group

Nanjing, China

- Designed a suite of anomaly detection algorithms based on statistical modeling, machine learning, and deep learning for multivariate time series anomaly detection. Techniques applied include GNN, Transformer, GAN, Mask, etc.
- Contributed to two papers and one patent, with both papers accepted by SCI-JCR Q2 journals.

Awards

- | | |
|---|---|
| • 2023 Nov, Southeast University, Scholarship | Algorithm Competition, Global Top 3% |
| • 2023 Jul, Huawei Spark Award, Value Prize | • 2021 Nov, "Challenge Cup" Academic Science and Technology Competition, National First Prize |
| • 2023 Jan, China Graduate Mathematical Contest in Modeling, National Third Prize | • 2020 Dec, Nanjing University of Posts and Telecommunications, Scholarship |
| • 2022 Nov, Southeast University, Scholarship | • 2020 Oct, "Yuezuan Cup" Software Design Competition, Third Prize |
| • 2022 Apr, Alibaba Cloud Panjiu Intelligent | |

Technical Skills

Languages: Python, C/C++, Java, Julia, SQL

Frameworks: Pytorch, Gym, PyDCOP, PyG, CVXPY, CPLEX, Gurobi, SCIP

More information can be found on my [personal website!](#)