Juntong Peng

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RESEARCH INTEREST

MULTI-AGENT GRAPH INTELLIGENCE, TRAJECTORY PREDICTION, COLLABORATIVE PERCEPTION

EDUCATION

SHANGHAI JIAO TONG UNIVERSITY   Shanghai,China | Jun 2024(expected)
B.ENG IN INFORMATION ENGINEERING
Coursework: Practice of Autonomous Localization and Navigation(A+); Digital Electronics(A+); Thinking and Methodology in Programming(A); Data Structure(A-); Probability and Statistics(A-); Reinforcement Learning(A-); Machine Learning(A-);
Ongoing: Information Theory; Algorithms and Complexity; Visual Localization and Perception;
Major Score: 85/100
Honors: 2021 SEIEE Outstanding Student Scholarship(Top 30%)

PURDUE UNIVERSITY, WEST LAFAYETTE   Indiana, United States | Summer 2023
VISITING SCHOLAR

PUBLICATIONS

[1]. Yuxi Wei, **Juntong Peng**, Tong He, Chenxin Xu, Jian Zhang, Shirui Pan, and Siheng Chen. "Compatible Transformer for Irregularly Sampled Multivariate Time Series". *2023 IEEE International Conference on Data Mining(ICDM23).*

[2]. **Juntong Peng**, Hrishikesh Viswanath, Kshitij Tiwari, Aniket Bera, "Graph-based Decentralized Task Allocation for Multi-Robot Target Localization". *2024 IEEE International Conference on Robotics and Automation (ICRA24).* under review

[3]. Yue Hu, **Juntong Peng**, Sifei Liu, Junhao Ge, Si Liu, Siheng Chen,"Communication-Efficient Collaborative Perception via Information Filling with Codebook". *The IEEE/CVF Conference on Computer Vision and Pattern Recognition 2024 (CVPR24).* under review

[4]. Yue Hu, **Juntong Peng**, Yunqiao Yang, Xiaoqi Qin, Zhiyong Feng, Wenjun Zhang, Siheng Chen, "Communication-Efficient Multi-Agent 3D Detection via Hybrid Collaboration". *2024 IEEE International Conference on Robotics and Automation(ICRA24).* under review

RESEARCH EXPERIENCE

COMMUNICATION HYPEREFFICIENT CO-PERCEPTION   CMIC, Shanghai Jiao Tong University
SUPERVISOR: PROF. SIHENG CHEN   Nov 2022 – Present

- Developed a hybrid collaboration method that improved the trade-off between communication cost and detection performance under the scenario of autonomous driving.
- The method utilized an instance-based spatial dynamic compressor to intentionally preserve informative data. The method is naturally capable for different models, which is important in real-world implementation. **Coauthored an ICRA24 paper submission [4].**
- Currently researching adaptive codebook compression techniques, along with information theory guided collaboration strategy. **Coauthored an CVPR24 paper submission [3].**

MULTI-ROBOT COLLABORATIVE TASK ALLOCATION   IDEAS Lab, Purdue University
SUPERVISOR: PROF. ANIKET BERA   June 2023 - Present

- Proposed a decentralized task allocation algorithm for multi-robot target localization based on graph attention network.
- A heterogeneity-aware preprocessor is adopted to enable the model to operate on a heterogeneous multi-robot system where robots have different capability in perception or mobility.
- **The work was submitted to ICRA24 [2] and is available here .**

MULTI-AGENT BEHAVIOR PREDICTION CMIC, Shanghai Jiao Tong University
SUPERVISOR: PROF. SIHENG CHEN May 2022 – June 2023

- Designed a multi-variate prediction model for time-irregular data, employing cross-variate and inter-variate attention mechanisms.
- The architecture utilizes correlations between agents to benefit the quality of the temporal prediction.
- **Coauthored a paper accepted by ICDM23 [1]. The article is available** here.

SOCIAL RECOMMENDATION SYSTEM WITH MASSIVE DATA ANL, Shanghai Jiao Tong University
SUPERVISOR: PROF. XIAOFENG GAO Aug 2021 – Oct 2022

- Collaborated with Alibaba on a GNN-based method to enhance social recommendation systems.
- Explored and validated the impacts of time-domain down-sampling on prediction accuracy and performance.

TEACHING ASSISTANCE

CS1108 | INTRODUCTION TO DATA SCIENCE FALL 2023

- Assisted in developing hands-on examples and additional class materials, focusing on PyTorch and machine learning introductions.
- Lectured a lesson about deep learning in data science.
- Mentored students on their course projects.

ACADEMIC SERVICE

REVEIWER | IEEE ROBOTICS AND AUTOMATION LETTERS (RA-L) 2023

- Served as a reviewer since 2023.

PROJECT EXPERIENCE

SRC | ROBOCUP SSL TEAM REPRESENTING SJTU OCT 2021 – NOW

- Led the electronic control team, spearheading a major robot upgrade
- Developed planning algorithms on CUDA accelerators for tactical game strategies.
- **Achieved third place in the 2023 China RoboCup.**

ICE3307 | COURSE PROJECT SPRING 2023

- Developed a virtual channel for bit-stream transfer using deep learning encoder-decoder structures.
- Conducted experiments on various assumptions to achieve robustness against Gaussian noise. Enhanced privacy by mixing noise and payloads.
- The source code is available here. We are still working to improve the model.

SKILLS&LANGUAGE

Programming Languages: C++/C, Python, VHDL, Matlab, Kotlin
Tools: Git, LaTeX, Pytorch, Slurm, Altium Designer
TOEFL iBT: 108/120(speaking 23)