Jie Feng

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EDUCATION

Zhejiang University, Hangzhou, China
Bachelor of Engineering, Automation (Robotics)   *Sep' 2017 - Jul' 2021 (Expected)*

- **GPA: 3.96/4.0** (89.6/100)
- **Rank: 8/154** (Overall)
- **Honors Program:** Mixed Class in Chu Kochen Honor College (**Top 5%** students at Zhejiang University)

University of California, Berkeley, Berkeley, USA
Visiting Student   *Jul' 2020 - Nov' 2020*

- **Advisor:** Prof. Masayoshi Tomizuka

RESEARCH INTERESTS

My goal is to develop intelligence for robots that learns from people with little supervision. My research interests broadly lie in robotics, computer vision and deep learning.

PUBLICATIONS

Journal
- **Jie Feng***, Haoyan Xu*, Ziheng Duan*, Runjian Chen, Yida Huang, Yueyang Wang. Graph Partitioning and Graph Neural Network based Hierarchical Graph Matching for Graph Similarity Computation, submitted to Neurocomputing, under review

Workshop
- XiangJi Wu, Ziwen Zhang, **Jie Feng**, Lei Zhou, Junmin Wu, End-to-end Optimized Video Compression with MV-Residual Prediction, CVPRW, 2020

Conference
- Haoyan Xu*, Runjian Chen*, Yunsheng Bai*, Ziheng Duan, **Jie Feng**, Ke Luo, Yizhou Sun, Wei Wang, Hierarchical Large-scale Graph Similarity Computation via Graph Coarsening and Matching, submitted to AAAI 2021, under review
- Haoyan Xu, Yida Huang, Ziheng Duan, Xiaoqian Wang, **Jie Feng**, Pengyu Song. Multivariate Time Series Forecasting with Transfer Entropy Graph, preprint, arxiv
- Haoyan Xu, Ziheng Duan, Yida Huang, **Jie Feng**, Anni Ren, Pengyu Song, Xiaoqian Wang, Parallel Extraction of Long-term Trends and Short-term Fluctuation Framework for Multivariate Time Series Forecasting, preprint, arxiv
- Yida Huang, Haoyan Xu, Ziheng Duan, Anni Ren, **Jie Feng**, Xiaoqian Wang. Modeling Complex Spatial Patterns with Temporal Features via Heterogenous Graph Embedding Networks, preprint, arxiv

RESEARCH PROJECTS

Mechanical Systems Control Lab   **University of California, Berkeley**
Supervisor : Prof. Masayoshi Tomizuka   *Jul '2020 - Present*

Interaction-aware Trajectory Prediction for Autonomous Driving
- Proposed a novel GNN architecture which incorporates attention mechanism based on agents' distance and speeds. This framework could model interaction between road agents and update features
- Implemented ODE-net for trajectory fitting, which could learn better sequential information and generate robust and differentiable results
- Reproduced Vector net and tested its performance under different levels of uncertainty.

TuCodec AI Lab   **TuCodec, Shanghai**
Supervisor : Doc. Lei Zhou   *Jan '2020 - Jun '2020*

Research On Video Compression
- Designed a novel end-to-end video compression framework with joint motion vector and residual prediction for P-frame tasks, and the prior probability of the representations are modeled by a hyperprior autoencoder. Our modeled outperformed H.266 in both quality and speed.
- Participated in the CVPR CLIC 2020. Our framework achieve the highest MS-SSIM performance for P-frame task in both validation phase and test phase

Institute of Cyber-Systems and Control   **Zhejiang University, Hangzhou**
Supervisor : Prof. Rong Xiong   *Apr '2019 - May '2020*

Robot Ontology Building with Multi-information Fusion

- Designed a novel knowledge graph architecture which can be upgraded by automatically adding nodes (items and actions) into it with photoing and audio instructions
- Deployed HSL features to realize real time hands segmentation
- Applied TRN (Temporal Relation Reasoning Network) for action recognition
- Proposed a depth-first based process (sub-graphs in the Ontology Graph) searching algorithm, which could find required process with a picture or description of expected state

Interest-oriented Research   **Zhejiang University, Hangzhou**
Main members : Haoyan Xu, Jie Feng, Ziheng Duan, Yida Huang   *Jan '2020 - Oct '2020*

Research On Graph Neural Network

- Proposed a novel Graph partition based graph matching network, which partitioned large graphs to sub-graphs. The sub-graphs were fed into fine matching algorithms
- Participated in the design of the graph coarsening model, both model frameworks achieved state-of-the-art performance in graph matching problem with a lower time complexity
- Experimentally demonstrated the competence of our model in both similarity regression and classification problems. The coarsening model trained from relatively small graphs (100 nodes) can infer similarity of large graphs (with thousands of nodes)

Research On Graph Neural Network based Multivariate Time Series

- Reproduced competitive baselines for performance comparison
- Introduced the idea of vector error correction model to Parallel Extraction network, which gives huge promotion when the time series satisfy a long-term trend with short-term fluctuations and could achieve state-of-the-art performance on Nasdaq with other designs

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COURSE PROJECTS

Comprehensive Slam Framework
Course : Robotics | Supervisor : Prof. Rong Xiong   *May '2020 - Jun '2020*

- Deployed Bayes Rules to update Occupancy Grid Map with LiDAR information
- Implemented Extended Kalman filter and particle filter for localization
- Implemented A* as global planner and DWA as local planner
- Used bug algorithm for obstacle avoidance

Robot Arm Trajectory planning
Course : Design and practice of robot | Supervisor : Prof. Rong Xiong   *Jul ' 2020*

- Implemented forward kinematics and inverse kinematics on 6R ANNO Arm in ROS
- Used Jacobian to realize velocity planing and introduced fifth-order polynomial to generate trajectories in ROS
- Deployed the algorithms tested in simulation on real ANNO robot arm

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AWARDS & ACHIEVEMENTS

Scholarships & Awards
- **First-class Scholarship for Academic Excellence** (Top 3%)   *Oct '2020*
- **Tanglixin Scholarship** for Academic Excellence (30 out of 24878)   *2018 - 2020*
- **Academic Excellence Award**, Zhejiang University   *2018 - 2020*
- **1st Place in 3rd Challenge on Learned Image Compression in P-frame Track**, Conference on Computer Vision and Pattern Recognition   *Jun '2020*

COMPUTER SKILLS

Languages: C, C++, Python, MATLAB, LaTeX, Assembly
Frameworks: OpenCV, Pytorch, Tensorflow
Operating systems: Linux, ROS

LANGUAGE

Native speaker of Mandarin Chinese and **fluent English**
Standard tests: GRE 327 (V 158, Q 169); TOEFL 109 (R 30, L 29, S 23, W 27)