

# 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

## 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

### Robot Perception and Learning Lab

*Supervisor : Prof. Yuke Zhu*

**The University of Texas at Austin**

*Nov '2020 - Present*

**Benchmark designing for manipulators to grasp deformable objects** (In Progress)

- Build the environment in Robosuite with Mujoco Engine
- Benchmark existing robot learning methods for soft objects grasping

### Mechanical Systems Control Lab

*Supervisor : Prof. Masayoshi Tomizuka*

**University of California, Berkeley**

*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
- Proposed an Fourier based differentiable model for smooth trajectory fitting.
- Reproduced Vector net and tested its performance under different levels of uncertainty.

### TuCodec AI Lab

*Supervisor : Prof. Lei Zhou*

**TuCodec, Shanghai**

*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 achieved the highest MS-SSIM performance for P-frame task in both validation phase and test phase.

**Institute of Cyber-Systems and Control**

*Supervisor : Prof. Rong Xiong*

**Zhejiang University, Hangzhou**

*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 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, DWA as local planner and 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**

- **Innovation Scholarship for Academic Advances** (Chu Kochen College) *Nov '2020*
- **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*

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**COMPUTER  
SKILLS**

**Languages:** C, C++, Python, MATLAB, L<sup>A</sup>T<sub>E</sub>X, Assembly

**Frameworks:** OpenCV, Pytorch, Tensorflow

**Operating systems:** Linux, ROS

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**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)