Tianyang Zhao

tyzhao@ucla.edu • https://programminglearner.github.io

EDUCATION

University of California, Los Angeles

Ph.D. student in Statistics, GPA: 3.93/4.00 Sep 2019 – Present
Advisor: Prof. Ying Nian Wu, *Center for Vision, Cognition, Learning and Autonomy (VCLA)*

Peking University

B.S. in Data Science and Big Data Technology; *Yuanpei College* Sep 2015 – Jul 2019
Advisor: Prof. Yizhou Wang, *School of EECS*

INTERESTS

Machine learning, computer vision, especially deep unsupervised and generative learning

PUBLICATIONS

[1] Tianyang Zhao, Yifei Xu, Mathew Monfort, Wongun Choi, Chris Baker, Yibiao Zhao, Yizhou Wang, Ying Nian Wu. "Multi-Agent Tensor Fusion for Contextual Trajectory Prediction". *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019. *ICML Workshop on AI for Autonomous Driving*, 2019.

[2] Yifei Xu, Jianwen Xie, Tianyang Zhao, Chris Baker, Yibiao Zhao, Ying Nian Wu. "Energy-Based Continuous Inverse Optimal Control". *NeurIPS Workshop on Autonomous Driving*, 2020.

WORK EXPERIENCE

Twitter Inc, Cortex Applied Research | *Software Engineering Intern* Jun 2020 – Sep 2020

- Explored sparse attention networks for ads recommendation system and achieved significant offline gains over the model currently used in production.

ACADEMIC EXPERIENCE

Peer-reviewed Journals and Conferences: CVPR, IROS, IEEE-ITS

Teaching Assistant | *Department of Statistics, UCLA*: Intro to Probability (100A), Theoretical Stats (200B)

RESEARCH EXPERIENCE

Inhibition Neurons for Representation Learning
Center for Vision, Cognition, Learning and Autonomy, UCLA Mar 2020 – Present

Multi-Agent Trajectory Prediction for Autonomous Driving
UCLA & ISEE Inc. (an MIT autonomous driving start-up) Jun 2018 – Nov 2018
Advisors: Ying Nian Wu, Wongun Choi, Chris Baker, Yibiao Zhao

- Proposed, implemented, and trained novel Multi-Agent Convolutional Tensor Fusion networks to reason about social interactions among varying numbers of agents & about constraints from scene contexts, which retains the spatial structure of agents and the scene;
- Conducted ablative studies on Stanford Drone and NGSIM datasets, outperformed *Social GAN*;
- Paralleled Multi-Agent code on GPU; presented at CVPR 2019; released the code on Github;
- Participated in proposing another Inverse Optimal Control (IOC) based prediction approach, which learns non-Markovian cost functions defined over entire trajectories; participated in extending weighted feature-based cost functions to neural network augmented ones.

Automatic Music Generation
School of EECS, Peking University | Advisor: Yizhou Wang Jun 2017 – Jun 2018

- Trained hierarchical LSTM to generate music with long-range consistency, and proposed to incorporate domain knowledge into reinforcement learning rewards to encourage long-term structure.

OPEN SOURCE PROJECTS

Chinese Chess Game and AI with Heuristic α-β Tree Search Feb 2018

- Developed a Chinese Chess game and AI program from scratch; 3000+ lines in C++.
- Proposed and implemented a novel approach of α-β tree search based on heuristic methods;
- Proved its superiority over conventional α-β search w.r.t. time complexity and empirical winning rate;

Automatic Back-Propagation for DAG and Neural Networks Mar 2018

AWARDS AND HONORS

Merit Student (top 10%), Peking University Nov 2017
Meritorious Winner (top 15%), Mathematical Contest in Modeling (MCM) Feb 2018
3rd Prize, ACM Programming Contest in Peking University May 2017