Tianyang Zhao

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EDUCATION

University of California, Los Angeles

Ph.D. student in Statistics — Sep 2019 – Present
Advisor: Prof. Ying Nian Wu, *Center for Vision, Cognition, Learning and Autonomy*

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". *ArXiv*:1904.05453.

RESEARCH EXPERIENCE

Inhibition Neurons for Representation Learning
Center for Vision, Cognition, Learning and Autonomy, UCLA — Mar 2020 – Present
Advisor: Ying Nian Wu

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 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 the Multi-Agent code on GPU; presented the paper at CVPR 2019; published the source 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 — Jun 2017 – Jun 2018
Advisor: Yizhou Wang

- Proposed hierarchical LSTM architectures to learn long-range consistency for sequence modeling;
- Designed the architecture as follows: a higher level learns correlations across measures and patterns for chord progressions, and a lower level learns a distribution over the notes to generate within a measure; the two operate at different clock rates while communicating with each other.

WORK EXPERIENCE

Twitter Cortex
Software Engineering Intern — Jun 2020 – Present

PROFESSIONAL SERVICES

Peer-reviewed Journals and Conferences

- International Conference on Intelligent Robots and Systems (IROS), 2020

OPEN SOURCE PROJECTS

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

- Developed a Chinese Chess game program from scratch;
- Proposed and implemented a novel approach of α-β tree search based on heuristic methods;
- Proved its superiority over conventional α-β tree search w.r.t. time complexity and winning rate;
- 3k+ lines in C++.

Automatic Back-Propagation — Mar 2018

- Implemented automatic BP algorithm for any given DAG and Neural Nets from scratch
- The program calculates backward path automatically, given any forward path.

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
	5 of 318, Botzone AI contest (Reversi Bots) in Peking University	Feb 2016
SKILLS	C/C++, Python, R, SQL, PyTorch, TensorFlow	
	Fluent in Chinese and English	