Tianyang ZHAO (Steven)

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EDUCATION

Department of Statistics, UCLA   **Los Angeles, CA**
➤ Ph.D. Candidate Student   *Sept 2019 -*

Yuanpei College, Peking University   **Beijing, China**
➤ Bachelor of Science in Data Science and Big Data Technology,   *Aug 2015 - Jul 2019*
➤ GPA (Junior Year): **3.70/4.0**; TOEFL: **111/120**;
➤ Core Courses: Statistical Learning / Reinforcement Learning / Computer Vision & Deep Learning / Mathematical Statistics / Probability Theory / Algebraic Structure & Combinatorial Mathematics / Numerical Methods / Mathematical Analysis / Intro to Data Science / Intro to Computation / C&C++ / Data Structure & Algorithm / Algorithm Design & Analysis / Intro to Computer Systems / Compiler Design / Computer Networks / Database Systems (Honor Track)

Department of Statistics, UCLA   **Los Angeles, CA**
➤ Research Assistant   *Jun 2018 - Nov 2018*

The High School Affiliated to Renmin University of China (RDFZ)   **Beijing, China**

PUBLICATIONS

➤ **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. ***IEEE Conference on CVPR 2019***;
➤ Yifei Xu, **Tianyang Zhao**, Chris Baker, Yibiao Zhao, Ying Nian Wu. Learning Trajectory Prediction with Continuous Inverse Optimal Control via Langevin Sampling. ***ArXiv:1904.05453***.

RESEARCH EXPERIENCE

Multi-Agent Trajectory Prediction for Autonomous Driving with Deep Learning and Inverse Optimal Control
                                                                                                                                     UCLA, Los Angeles, CA
Research Assistant, Advisor: **Ying Nian Wu***, Professor at Department of Statistics, UCLA*   *Jun 2018 – Mar 2019*
Co-advisors: **Wongun Choi, Chris Baker, Yibiao Zhao**
➤ Proposed, implemented, and trained a novel Multi-Agent Convolutional Tensor Fusion model to reason about social interactions among varying numbers of agents & between agents and scene contexts, which retains the spatial structure of agents and the scene;
➤ Implemented a Conditional GAN to learn a joint distribution of multi-agent trajectories based on the proposed Fusion model;
➤ Conducted ablative studies on Stanford Drone and NGSIM datasets, outperformed *Social GAN*;
➤ Paralleled the Multi-Agent code on GPU to accelerate training; presented the paper at *CVPR 2019*;
➤ 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; completed a manuscript submitted to *ArXiv*.

Music Generation with Hierarchical Deep Reinforcement Learning, EECS, Peking University   **Beijing, China**
Computer Vision and Digital Art (CVDA) research group   *Jun 2017 - Jun 2018*
Research Assistant, Advisor: **Yizhou Wang***, Professor at School of Electronics Engineering and Computer Science, PKU*
➤ Proposed novel hierarchical LSTM architectures and corresponding RL algorithms to learn long-range consistency for sequence modeling, and to generate music by combining learned patterns from dataset with structured domain knowledge;
➤ 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;
➤ Generated samples via supervised learning: https://github.com/HAPPIER-Music/ ; completed a manuscript.

OPEN SOURCE PROJECTS

➤ **Homepage**: https://programminglearner.github.io/. Proficient in C++, C, python, TensorFlow, PyTorch.
➤ **Chinese Chess Program Developing and AI Designing with Novel Heuristic α-β Tree Search**: 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**: Implemented automatic BP algorithm for any given DAG and Neural Nets from scratch, which calculated the backward path automatically, given any forward path.

AWARDS AND HONORS

➤ Merit Student (top 10%), Peking University, Nov 2017;
➤ 5 of 318, Botzone AI contest (Reversi), Peking University;
➤ Meritorious Winner (top 15%), Mathematical Contest in Modeling (MCM), Feb 2018;
➤ 3rd Prize, ACM Programming Contest in Peking University, May 2017