Tianyang Zhao

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EDUCATION

University of California, Los Angeles

Ph.D. candidate in Statistics, GPA: 3.94/4.00 Sep 2019 – Jun 2024 (anticipated)
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, Language Modeling, Generative Learning, Behavior Prediction, Energy-Based Models, Markov Chain Monte Carlo, Reinforcement 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.

[2] Bo Pang, Tianyang Zhao, Xu Xie, Ying Nian Wu. "Trajectory Prediction with Latent Belief Energy-Based Model".
Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021.

[3] 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 Team

Engineering Intern | Mentors: Ying Xiao, Yury Malkov, Ahmed El-Kishky Jun 2021 – Sep 2021

- Applied deep language models on users' historically engaged tweet sequences to build user profiles for future engagement prediction, and achieved offline gains over current production model.
- Explored efficiency optimizations for overcoming IO barriers in training these models on very large scale distributed dataset, including re-implementing product quantization decoder on GPU.
- Researched intermediate bottleneck representations for transformers to shorten inference time.

Software Engineering Intern | Mentor: Yury Malkov Jun 2020 – Sep 2020

- Explored sparse attention networks on tabular data for ads recommendation system and achieved significant offline gains over current production model.

ACADEMIC EXPERIENCE

Peer-reviewed Journals and Conferences: CVPR, ICCV, ICRA, IROS, IEEE-T-ITS, IEEE-RA-L

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

RESEARCH EXPERIENCE

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

- Developed deep latent-space energy-based models (EBM) for unsupervised and generative learning, and developed an amortized variational inference version of it for trajectory prediction;
- Applied short-run Markov Chain Monte Carlo (MCMC) to reduce sampling time for the negative phase of training these energy-based models;
- Studied inhibition neurons for inducing sparsity in deep representation learning;
- Explored semi-supervised learning with consistency regularization for learning with noisy samples.

ISEE Inc, Autonomous Driving - Behavior Prediction Team Jun 2018 – Nov 2018

- Designed Multi-Agent Tensor Fusion ConvNets to reason about social interactions among varying numbers of agents & about constraints from scene contexts for trajectory prediction;
- Explored energy-based continuous Inverse Optimal Control (IOC) to learn non-Markovian cost functions over vehicle trajectories.

OPEN SOURCE PROJECTS

C++: Chinese Chess Game and AI with Heuristic α-β Tree Search Feb 2018
Python: 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