Tianyang Zhao

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EDUCATION

University of California, Los Angeles

Ph.D. candidate in Statistics, GPA: 3.96/4.00 — Sep 2019 – Feb 2025 (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 Models, Top-down Generative & Energy-Based Models

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".
IEEE/CVF 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".
IEEE/CVF 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".
IEEE Transactions on Neural Networks and Learning System (TNNLS), 2022;

WORK EXPERIENCE

Amazon Inc, AWS AI Labs - Computer Vision Team

Applied Scientist Intern | Mentors: Yash Singh, Srikar Appalaraju — Jun 2022 – Sep 2022

- Researched knowledge distillation for large vision language Transformers to shorten their inference time on visual question answering (VQA) and image captioning tasks.
- Proposed and experimented a new attention map distillation method for multi-head Transformers.

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.

SELECTED 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 and composition 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.

PROFESSIONAL SERVICES

Peer-reviewed Conferences

IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021-2023
IEEE/CVF International Conference on Computer Vision (ICCV), 2021, 2023
IEEE International Conference on Robotics and Automation (ICRA), 2022
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020

Peer-reviewed Journals

IEEE Robotics and Automation Letters (RA-L)
IEEE Transactions on Mobile Computing (TMC)
Pattern Recognition (PR)
IEEE Transactions on Intelligent Transportation Systems (TITS)

TEACHING EXPERIENCE

Teaching Assistant | *Department of Statistics, UCLA*

Introduction to Probability (Stats 100A, for undergraduate students)	Sep 2020- Dec 2020
Theoretical Statistics (Stats 200B, for PhD and MS students)	Jan 2021- Mar 2021

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