Yuanhao Xiong

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EDUCATION

University of California, Los Angeles — **Los Angeles, USA**
Ph.D. student in Computer Science — *Sep. 2019 - Present*

Zhejiang University — **Hangzhou, China**
B.Eng. in Information Engineering — *Aug. 2015 - Jun. 2019*
GPA: 3.95/4, Ranking 1 out of 176

RESEARCH INTERESTS

My research interests lie in developing machine learning algorithms in various related fields including **adversarial learning**, **learning to learn**, and **optimization**.

RESEARCH EXPERIENCE

University of California, Los Angeles — **Los Angeles, CA, U.S.**
Research Assistant, Advisor: Prof. Cho-Jui Hsieh — *Jul. 2019 - Present*

Learning to Learn for Adversarial Training

- Leveraged a learning-to-learn (L2L) framework to train an optimizer with recurrent neural networks (RNN), providing update directions and steps adaptively for the inner problem.
- Improved robust accuracy of PGD-based adversarial training and TRADES throught co-training optimizer's parameters and model's weights.

Learning to Learn by Zeroth-Order Oracle

- Extended the learning to learn (L2L) framework from first-order to zeroth-order (ZO) optimization.
- Proposed a novel RNN optimizer architecture which learns both parameter update rule and Gaussian sampling rule for ZO optimization.

City Brain Research Group at Tianrang Inc. — **Hangzhou, China**
Research Intern, Advisor: Prof. Zhenhui Li — *Oct. 2018 - May. 2019*

Learning Traffic Signal Control from Demonstrations

- Proposed DemoLight to leverage demonstrations collected from classic transportation methods for traffic signal time allocation to accelerate reinforcement learning.

Learning Phase Competition for Traffic Signal Control

- Designed a novel network structure for Q-network based on phase competition in traffic signal control.
- Achieved superior generalizability for different road structures and traffic conditions.

AI Labs at Didichuxing Inc. — **Beijing, China**
Research Intern, Advisor: Prof. Yan Liu — *Jul. 2018 - Oct. 2018*

Improved Adaptive Optimization Algorithm

- Demonstrated that extreme learning rates in adaptive methods could lead to poor performance.
- Provided new variants of Adam, employing dynamic bounds on learning rates to achieve a gradual transition from Adam to SGD and gave a theoretical proof of convergence.

Communication Lab at Zhejiang University **Hangzhou, China**
Research Assistant, Advisor: Prof. Guanding Yu *Nov. 2017 - Feb. 2018*

Deep Learning for Linear Sum Assignment Problems

- Employed Hungarian method to obtain the datasets of optimal solution for the four-people assignment problem and divided them into training, validation and testing datasets to build a deep learning model.
- Transformed the optimization problem into a classification problem, used MLP and CNN to solve it, and achieved over 90% accuracy in four-people problem.

PUBLICATIONS

(* indicates equal contribution.)

[1] Yangjun Ruan, **Yuanhao Xiong**, Sashank Reddi, Sanjiv Kumar, and Cho-Jui Hsieh. Learning to learn by zeroth-order oracle. In *Proceedings of the 8th International Conference on Learning Representations (**ICLR**)*, 2020.

[2] Chacha Chen, Hua Wei, Nan Xu, Guanjie Zheng, Ming Yang, **Yuanhao Xiong**, Kai Xu, and Zhenhui Li. Toward a thousand lights: Decentralized deep reinforcement learning for large-scale traffic signal control. In *Proceedings of the 34th AAAI Conference on Artificial Intelligence (**AAAI**)*, 2020.

[3] **Yuanhao Xiong**, Guanjie Zheng, Kai Xu, and Zhenhui Li. Learning traffic signal control from demonstrations. In *Proceedings of the 28th ACM International Conference on Information and Knowledge Management (**CIKM**)*, 2019.

[4] Guanjie Zheng, **Yuanhao Xiong**, Xinshi Zang, Jie Feng, Hua Wei, Huichu Zhang, Yong Li, Kai Xu, and Zhenhui Li. Learning phase competition for traffic signal control. In *Proceedings of the 28th ACM International Conference on Information and Knowledge Management, (**CIKM**)*, 2019.

[5] **Yuanhao Xiong***, Liangchen Luo*, Yan Liu, and Xu Sun. Adaptive gradient methods with dynamic bound of learning rate. In *Proceedings of the 7th International Conference on Learning Representations (**ICLR**)*, 2019.

[6] Mengyuan Lee, **Yuanhao Xiong**, Guanding Yu, and Geoffrey Ye Li. Deep neural networks for linear sum assignment problems. *IEEE Wireless Communications Letters*, 7(6):962–965, 2018.

SKILLS

Programming Language: Python, C++, Java

Deep Learning Framework: PyTorch, Tensorflow, Keras

AWARDS & HONORS

- Outstanding Graduate of Zhejiang Province *Jun. 2019*
- Outstanding Graduate of Zhejiang University *Jun. 2019*
- National Scholarship (Top 1%) *2017 - 2018*
- First-Class Scholarship for Outstanding Merits *2015 - 2018*
- Meritorious Winner in Mathematical Contest in Modeling *Apr. 2017*