Zihan Zhou

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EDUCATION

ACM Honors Class, Shanghai Jiao Tong University
Bachelor of Engineering, Computer Science *Sept. 2016 – Present*

- ACM Honors Class is an elite CS program at SJTU for students ranked in the top 5% of the school

AI and Social Good Lab (AISOC Lab), Carnegie Mellon University
Research intern, supervised by Prof. Fei Fang *June 2019 – Present*

- Prof. Fei Fang is an Assistant Professor in the Institute for Software Research in the School of Computer Science at Carnegie Mellon University.
- Focused on Multi-agent Reinforcement Learning and Game Theory

PREPRINTS

Xuehui Sun, **Zihan Zhou**, and Yuda Fan. "Image Based Review Text Generation with Emotional Guidance". In: *arXiv e-prints*, arXiv: 1901.04140 [cs.CL].

Qian Long*, **Zihan Zhou***, Abhinav Gupta, Fei Fang, Yi Wu†, and Xiaolong Wang†. "Evolutionary Population Curriculum for Scaling Multi-Agent Reinforcement Learning". In: *ICLR 2020 under review (review score 6, 6, 8)*, OpenReview: https://openreview.net/forum?id=SJxbHkrKDH.

PUBLICATIONS

Huichu Zhang, Siyuan Feng, Chang Liu, Yaoyao Ding, Yichen Zhu, **Zihan Zhou**, Weinan Zhang, Yong Yu, Haiming Jin, and Zhenhui Li. "CityFlow: A Multi-Agent Reinforcement Learning Environment for Large Scale City Traffic Scenario". In: *WWW. 2019 Demo*, arXiv: 1905.05217 [cs.MA]. URL: https://cityflow-project.github.io/

Zihan Zhou, Zheyuan Ryan Shi, Fei Fang, and Yi Wu. "Approximated Temporal-Induced Neural Self-Play for Finitely Repeated Bayesian Games". In: *AAAI 2020 Workshop on Reinforcement Learning in Games (Oral presentation)*

PROJECTS

AutoML for Product-based Neural Networks *APEX Lab, SJTU*

- Proposed to use untraditional gradient-based Neural architecture search algorithms for parallel network structure optimization
- Introduced global penalty term to balance structural parameters to achieve performance improvement
- Finished ∼2000 lines of code and proposed compressed network representations for efficient computing

CityFlow: A Multi-Agent Reinforcement Learning Environment for Large Scale City Traffic Scenario *APEX Lab, SJTU*

- Involved in the implementation of crossing logic (one of the core components)
- Accepted by WWW 2019 Demo

*Equal contributions.
†Equal contributions.

Evolutionary Population Curriculum for Scaling Multi-Agent Reinforcement Learning *AISOC Lab, CMU*

- Proposed a novel learning paradigm for Multi-agent Reinforcement Learning for large number of agents (up to 40) with significantly better performance than state-of-the-art methods
- Implemented an efficient multi-processing module for experience collecting (including agents acting and environment processing) and training, able to achieve 20 times speedup while consuming 1/10 memory
- Finished the majority of the code ($\sim$8000 lines)
- Paper submitted to ICLR 2020 as first author with equal contribution, received review score 6, 6, 8

Approximated Temporal-Induced Neural Self-Play for Finitely Repeated Bayesian Games *AISOC Lab, CMU*

- Proposed a Reinforcement Learning algorithm to solve for PBNE, a refinement of Nash Equilibrium, in finitely repeated Bayesian games
- First work to use Reinforcement Learning for solving PBNE, achieved better scalability than previous mathematical solution (from ≤ 7 rounds to theoretically infinity) with minor precision loss
- Preliminary result on Security games accepted by AAAI 2020 Workshop on Reinforcement Learning in Games for *oral presentation* as first author
- Future work on adapting the algorithm to more complicated game environment in preparation for IJCAI 2020

SCHOLARSHIPS

Zhiyuan Honored Scholarship *(Top **2**% in SJTU)* *2016 & 2017 & 2018*

AWARDS

Gold Medal, 4^{th} place in The 2017 ACM-ICPC Asia Hua-Lien Regional Contest, Hualien, China

Gold Medal, 9^{th} place in The 2017 ACM-ICPC Asia Beijing Regional Contest, Beijing, China

Gold Medal, 5^{th} place in The 2016 ACM-ICPC Asia China-Final Contest, Shanghai, China

Gold Medal, 4^{th} place in The 2016 ACM-ICPC Asia Beijing Regional Contest, Beijing, China

SKILLS

Programming Language

- Proficient in C++, Python, Java, JavaScript

Deep Learning Libraries

- Proficient in Tensorflow and PyTorch