
BIO

I am currently a PhD student at the **Department of Computer Science, the University of Hong Kong**. Previously I obtained the M.Phil Degree at **Tsinghua University** and won many honors such as **Outstanding Graduate of Tsinghua University** and **Outstanding Graduation Thesis Award** at Tsinghua University. I got my bachelor's degree from the Department of Vehicle Engineering, **Harbin Institute of Technology** with **GPA of 95.11/100, ranking the first in my major (top 0.74%)** and obtained the **Excellent Provincial Graduates** and **Triple-A Student Pacesetter**.

I have received **6 Scholarships**, including **Hong Kong PhD Fellowship Scheme (HKPFS)**, **HKU Presidential PhD Scholar Programme (HKU-PS)**, **National scholarship 3 times** and **Principal first-Class Scholarship**. I have earned myself **5 national/international competition awards** and **4 provincial prizes**.

I have published **3 conference papers** as the first author, including the **NeurIPS 2021** (Thirty-fifth Conference on Neural Information Processing Systems, *CCF A class*), **ICML 2022** (International Conference on Machine Learning, *CCF A class*), and obtained the **Student Best Paper Award** in the **20th ICCAS** (International Conference on Control, Automation and Systems), **Finalists for the Best Student Paper Award of IV2021** (3/450). Besides, I have also published **5 conference papers** as co-author on **ICML2022**, **CVPR2022** (Conference on Computer Vision and Pattern Recognition), **IJCAI2022** (International Joint Conference on Artificial Intelligence), **CDC** (Conference on Decision and Control 2021, *best conference in control field*) and **IV** (IEEE Intelligent Vehicles Symposium).

I am served as **the reviewer** of the Conference on Neural Information Processing Systems (**NeurIPS**), the International Conference on Machine Learning (**ICML**), Journal of Automobile Engineering IEEE Intelligent Transportation Systems Society Conference (**ITSC**) and IEEE Intelligent Vehicles Symposium (**IV**).

My research interest focus on **Reinforcement Learning** and **Representation Learning**.

EDUCATION

- **The University of Hong Kong**

PhD candidate in Computer Science;

Aug. 2021 – Present

- In year 2021, ranks the 22th in QS World University Rankings.
- I am supervised by **Prof. Ping Luo**, who was named one of the young innovators by the MIT Technology Review "Innovators Under 35 (MIT TR 35)" Asia Pacific, and co-supervised by **Prof. Wenping Wang** (ACM Fellow, IEEE Fellow) and study in the **HKUMMLab**. I also work very close with Prof. Jianyu Chen, the assistant professor at Institute for Interdisciplinary Information Sciences (IIIS).

- **Tsinghua University (C9, Double First Class)**

China

Master in intelligent vehicle Engineering; GPA: 3.78/4.0; Ranking 17/64

Sep. 2018 – June. 2021

- In year 2020, Tsinghua University ranks the 1st in QS Chinese University Ranking and ranks the 15th in QS international University Ranking.
- I obtained the M.Phil Degree under the supervision of Prof. Bo Cheng and Prof. Shengbo Li at the Intelligent Driving Laboratory
- Courses with full marks 4.0: "Algorithm Analysis and Design" "Optimal Control" "Applied Stochastic Processes" "Advanced Machine Learning" "Intelligent Transportation Systems Modeling and Simulation" "Statistical Learning Theory and Applications" "Reinforcement Learning and Control" "Vehicle Control Engineering".

- **Harbin institute of technology (HIT, C9, Double First Class)**

China

Bachelor in Vehicle Engineering; GPA: 92.01/100; Ranking 1/135 (Top 0.74%)

Sep. 2014 – Jun. 2018

- Graduated with the honor of "Provincial Excellent Graduate" of Harbin institute of technology. (Top 10%)
- Graduated with the honor of "Provincial Triple-A Student Pacesetter". (**Top 0.4%**, 10 out of 2400 students)

HONOURS AND AWARDS

- **Scholarships**

- Hong Kong PhD Fellowship Scheme (**HKPFS**)
- HKU Presidential PhD Scholar Programme (**HKU-PS**)
- National Scholarship for 2014/2015 academic year (**Top 1%**, 2 out of 135 students in HIT)
- National Scholarship for 2015/2016 academic year (**Top 1%**, 2 out of 135 students in HIT)

- National Scholarship for 2016/2017 academic year (**Top 1%**, 2 out of 135 students in HIT)
- First-Class Scholarship for 2014/2015 academic year (**Top 10%**, 13 out of 135 students in HIT)

• Academic Competitions Awards

- **Student Best Paper Award** in the 20th International Conference on Control, Automation and Systems (ICCAS) (**Top 1%** (5/500) among accepted papers from 25 countries)
- **Finalists for the Student Best Paper Award** of IV2021 ((3/450)
- 2st Prize of National College Student Energy Conservation and Emission Reduction Competition (**Top 5%** in China)
- Meritorious Winner Award in Interdisciplinary Contest in Modeling (**Top 13%** worldwide)
- 2nd Second Prize of National College students Ocean Vehicle Design and Production competition (Top 5% in China)
- 3rd of National College Student Mathematics Competition (**Top 10%** in China)
- 1st Prize (provincial) of National College Student Mathematical Modeling Competition (**Top 10%**, in China)

• Honours

- **Outstanding Graduate** of Tsinghua University
- **Outstanding Thesis Award**, Tsinghua University
- Provincial excellent student award (**Top 1%** in HIT)
- Provincial excellent graduates (**Top 5%** in HIT)
- Provincial Triple-A Student Pacesetter (**Top 3%** in HIT)
- Outstanding League Member (**Top 10%** in HIT)

PUBLICATIONS

- [1] **Yao Mu**, Baiyu Peng, et al.. "Mixed reinforcement learning for efficient policy optimization in stochastic environments." 2020 20th International Conference on Control, Automation and Systems (ICCAS). IEEE, 2020. International Conference on Control, Automation and Systems (ICCAS) 2020 (**Student Best Paper Award**) .
- [2] **Yao Mu**, Yuzheng Zhuang, et al. "Model-Based Reinforcement Learning via Imagination with Derived Memory." Advances in Neural Information Processing Systems 34 (**NeurIPS2021**).
- [3] **Yao Mu**, Shoufa Chen, et al. "CtrlFormer: Learning Transferable State Representation for Visual Control via Transformer ." Accepted the International Conference on Machine Learning (**ICML 2022**)
- [4] Xiaoyu Chen, **Yao Mu**, et al. "Flow-based Recurrent Belief State Learning for POMDPs." Accepted by the international Conference on Machine Learning (**ICML 2022**)
- [5] Qiushan Guo, **Yao Mu**, et al. "Scale-Equivalent Distillation for Semi-Supervised Object Detection." Accepted by (**CVPR2022**).
- [6] Zhecheng Yuan, Guozheng Ma, **Yao Mu**, et al. "Don't Touch What Matters: Task-Aware Lipschitz Data Augmentation for Visual Reinforcement Learning." Accepted by (**IJCAI2022**).
- [7] Baiyu Peng, **Yao Mu**, et al. "Model-based actor-critic with chance constraint for stochastic system." 2021 60th IEEE Conference on Decision and Control (**CDC**). IEEE, 2021.
- [8] Baiyu Peng, **Yao Mu**, et al. "Separated proportional-integral lagrangian for chance constrained reinforcement learning." 2021 IEEE Intelligent Vehicles Symposium (IV). IEEE, 2021. (**Finalists for the Best Student Paper Award**)
- [9] Baiyu Peng, **Yao Mu**, et al. "Model-based Chance-Constrained Reinforcement Learning via Separated Proportional-Integral Lagrangian." arXiv preprint arXiv:2108.11623 (2021). Accepted by **IEEE Transactions on Neural Networks and Learning Systems**.

RESEARCH/WORK EXPERIENCE

- **Huawei Noah's Ark Lab** Beijing, China
Research Internship in Reinforcement learning May. 2020 - June. 2021
 - **Huawei Noah's Ark Lab:** The Noah's Ark Lab is the AI research center for Huawei Technologies. The lab's mission is to make significant contributions to both the company and society by innovating in artificial intelligence, data mining, and related fields.
 - **Work Duty:** Inspired by a neuroscience experiment of "forming artificial memories during sleep," an Imagining from derived memory (IDM) algorithm under a novel actor-critic framework to improve the sample efficiency and the policy robustness of MBRL. Various experiments on high-dimensional visual control tasks with arbitrary image uncertainty demonstrate that IDM outperforms existing approaches in terms of data-efficiency, robustness to uncertainty, and final performance. **This research work is accepted by NeurIPS 2021.**
- **Sensetime** China
Research Internship in Computer vision
 - **Sensetime AI Research Center:** SenseTime is a leading global company focused on developing AI technologies that advance the world's economies, society and humanity for a better tomorrow. It is also the world's most-funded AI pure-play with the highest valuation.
 - **Work Duty:** Mainly responsible for the research of interpretable feature extraction, we extracted explainable features such as object position, material characteristics, light source position, light source type in the picture. For rendering the image realistically, we used a physical rendering engine as the simulator. We designed an MDP process for the feature inference and used a physical rendering engine as the simulator for realistic rendering performance. The optimal interpretable feature is inferred by reinforcement learning due to its non-differentiability.
- **ForwardX Robotics** China
Research Internship in Reinforcement learning
 - **ForwardX:** ForwardX Robotics is the world's only developer of intelligent robotics to realize wide-scale commercial deployment of vision-first Autonomous Mobile Robots (AMRs) across a number of industries, such as logistics, manufacturing, and retail. Headquartered in Beijing, China, ForwardX has domestic locations in Shanghai and Shenzhen and a North American base in Phoenix, Arizona.
 - **Work Duty:** Mainly realized the structure design, parameter optimization, and landing of Target-driven Visual Navigation in Indoor Scenes using Deep Reinforcement Learning algorithm.

LEADERSHIP EXPERIENCE/ACTIVITIES

- **Department science and technology innovation centre in HIT** China
Chairman Nov. 2017 - Sep. 2018
 - Organized large-scale scientific and technological innovation competitions
 - Organized technical training activities to build a bridge to scientific research for junior students.
 - Elected as excellent student cadres (3/100 among all the student cadres)
- **The university's learning promotion centre** China
The founder and the first chairmen May. 2016 - Nov. 2017
 - Provided students with a multimedia seminar room for academic discussion.
 - Organized a number of activities on professional knowledge, literature research, overseas study experience exchange.
- **The 2017 United Nations Global Innovation camp for sustainable development** China
Team leader Aug. 2017
 - Cooperated with the students from Harvard University, Switzerland, the University of Edinburgh in the UK and other internationally renowned universities.
 - Using advanced methods and cutting-edge technologies to provide practical solutions and solutions for sustainable development goals jointly.
- **Didi international summer camp** China
Team leader Sep. 2019
 - Participated in the academic seminar on intelligent transportation and the hacker marathon sponsored by Didi Chuxing with teachers and students from the University of Sao Paulo.
 - Designed new functions of taxi service software for the disabled.

SKILLS

- **Programming Language:** Matlab(Expert), Python(Expert), Pytorch(Expert), C++(Intermediate), TensorFlow(Intermediate)
- **Softwares:** Git, Pycharm, Visual Studio, Microsoft Office

CONTACT

- **Email:** muyao@connect.hku.hk
- **Personal homepage:** <https://yaomarkmu.github.io>
- **Twitter:** <https://mobile.twitter.com/YaoMarkMu1>