

## 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 **5 top-tier AI/Robotics conference papers** as the **first author**, including the **NeurIPS 2021**, **NeurIPS 2022** (Conference on Neural Information Processing Systems, *CCF A class*), **ICML 2022** (IEEE / CVF Computer Vision and Pattern Recognition Conference, *CCF A class*), **CVPR 2023** (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 **9 conference papers** and **1 journal paper** as co-author on **ICML2022**, **NeurIPS2022**, **CVPR2022** (The International Conference on Learning Representations), **ICLR2023** (International Joint Conference on Artificial Intelligence), **IJCAI2022** (International Joint Conference on Artificial Intelligence), **CDC** (Conference on Decision and Control 2021, *best conference in control field*), **IV** (IEEE Intelligent Vehicles Symposium) and **IEEE TNNLS** (IEEE Transactions on Neural Networks and Learning Systems).

I am served as the **PC reviewer** of the Conference on Neural Information Processing Systems (**NeurIPS**), the International Conference on Machine Learning (**ICML**), IEEE / CVF Computer Vision and Pattern Recognition Conference (**CVPR**), AAAI Conference on Artificial Intelligence (**AAAI**), International Conference on Artificial Intelligence and Statistics (**AISTATS**), IEEE Intelligent Transportation Systems Society Conference (**ITSC**), IEEE Intelligent Vehicles Symposium (**IV**) and Journal of Automobile Engineering.

My research interest focus on **Embodied AI**, **Reinforcement Learning**, **Representation Learning**, **Robotic Control** and **Autonomous Driving**.

## EDUCATION

- **The University of Hong Kong** China  
*PhD candidate in Computer Science; Aug. 2021 – Present*
  - In year 2021, ranks the 22<sup>th</sup> 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. Xiaoou Tang** (IEEE Fellow, director of MMLAB) 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 1<sup>st</sup> in QS Chinese University Ranking and ranks the 15<sup>th</sup> 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 1/30 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**)
- 2<sup>st</sup> 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)
- 2<sup>nd</sup> Second Prize of National College students Ocean Vehicle Design and Production competition (Top 5% in China)
- 3<sup>rd</sup> of National College Student Mathematics Competition (**Top 10%** in China)
- 1<sup>st</sup> 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. (**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.” International Conference on Machine Learning (**ICML 2022**) .
- [4] **Yao Mu**, Yuzheng Zhuang, et al. “DOMINO: Decomposed Mutual Information Optimization for Generalized Context in Meta-Reinforcement Learning.” Advances in Neural Information Processing Systems 35 (**NeurIPS2022, Spotlight**).
- [5] **Yao Mu**, Shunyu Yao, et al. “EC<sup>2</sup>: Emergent Communication for Embodied Control.” The IEEE/CVF Conference on Computer Vision and Pattern Recognition 2023 (**CVPR2023**).
- [6] **Yao Mu**, Zhiqian Lan, et al. “Neural MPC-based Decision-making Framework for Autonomous Driving in Multi-Lane Roundabout.” The Scene Representations For Autonomous Driving Workshop on the eleventh International Conference on Learning Representations (**ICLR2023** Autonomous Driving workshop).
- [7] Zeyu Gao\*, **Yao Mu**\*(**co-first author**), et al. “SEM2: Enhance Sample Efficiency and Robustness of End-to-end Urban Autonomous Driving via Semantic Masked World Model.” Advances in Neural Information Processing Systems 35 (**NeurIPS2022** Deep RL workshop, Under review at IEEE TITS).
- [8] Yao Lai, **Yao Mu**, et al. “MaskPlace: Fast Chip Placement via Reinforced Visual Representation Learning.” Advances in Neural Information Processing Systems 35 (**NeurIPS2022, Spotlight**).

- [9] Xiaoyu Chen, **Yao Mu**, et al. “Flow-based Recurrent Belief State Learning for POMDPs.” International Conference on Machine Learning (**ICML 2022**).
- [10] Qiushan Guo, **Yao Mu**, et al. “Scale-Equivalent Distillation for Semi-Supervised Object Detection.” Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition.(**CVPR2022**).
- [11] Zhecheng Yuan, Guozheng Ma, **Yao Mu**, et al. “Don’t Touch What Matters: Task-Aware Lipschitz Data Augmentation for Visual Reinforcement Learning.” **IJCAI2022**: 3702-3708
- [12] Runjian Chen, **Yao Mu**, et al. “CO3: Cooperative Unsupervised 3D Representation Learning for Autonomous Driving”. The International Conference on Learning Representations (**ICLR2023**).
- [13] Yifu Yuan, Jianye Hao, Fei Ni, **Yao Mu**, et al. “EUCLID: Towards Efficient Unsupervised Reinforcement Learning with Multi-choice Dynamics Model”. The International Conference on Learning Representations (**ICLR2023**).
- [14] 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.
- [15] 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**)
- [16] Baiyu Peng, **Yao Mu**, et al. “Model-based Chance-Constrained Reinforcement Learning via Separated Proportional-Integral Lagrangian.” IEEE Transactions on Neural Networks and Learning Systems(**IEEE TNNLS, Impact Factor: 10.451**).
- [17] Yuhang Zhang, **Yao Mu**, et al. “Steadily Learn to Drive with Virtual Memory.” 2022 11th Asia-Pacific Regional Conference of the ISTVS (ISTVS 2022).
- [18] Dafeng Chi, Yuzheng Zhuang, **Yao Mu**, et al. “Offline-to-online Co-evolutional User Simulator and DIALOGUE System.” The Sere TOD workshop on the 2022 Conference on Empirical Methods in Natural Language Processing (**EMNLP 2022 Sere TOD workshop**).

## SKILLS

---

- **Programming:** Python(Expert), Pytorch(Expert), C++(Intermediate), TensorFlow(Intermediate)
- **Softwares:** Linux, Git, ROS, Pycharm, Visual Studio, Microsoft Office
- **Github:** <https://github.com/YaoMarkMu>

## CONTACT

---

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