Yao(Mark) Mu

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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**
  PhD candidate in Computer Science; *Aug. 2021 – Present*
  - In year 2021, ranks the 22^{th} 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**.

- **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^{st} in QS Chinese University Ranking and ranks the 15^{th} 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(iDLAB).**
  - 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^{st} 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^{nd} Second Prize of National College students Ocean Vehicle Design and Production competition (Top 5% in China)
  - 3^{rd} of National College Student Mathematics Competition (***Top 10%*** in China)
  - 1^{st} 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^2: 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 Augmentationfor 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

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