

# Xiao Ma

Lead Researcher @ Dyson Robot Learning Lab

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[Personal Website](#)

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## EDUCATION

National University of Singapore (NUS), Singapore

Aug. 2017 - Dec. 2021

Doctor of Philosophy in COMPUTER SCIENCE

Advisor: [Prof. David Hsu](#)

Shanghai Jiao Tong University (SJTU), Shanghai

Sept. 2013 - July 2017

Bachelor of Engineering in COMPUTER SCIENCE AND TECHNOLOGY

Advisors: [Prof. Xiaofeng Gao](#) and [Prof. Fan Wu](#)

## WORK EXPERIENCES

Lead Researcher at Dyson Robot Learning Lab

Feb. 2023 - present

Research Scientist at SEA AI Lab

Jul. 2021 - Jan. 2023

Research Intern at SEA AI Lab (hosted by [Dr. Min Lin](#) and [Dr. Shuicheng Yan](#))

Apr. 2021 - Jun. 2021

Research Intern at SenseTime Research (hosted by [Dr. Shuai Yi](#))

Oct. 2019 - Sept. 2020

Software Engineer Intern at Intel Asia Pacific R & D Center

May 2016 - Dec. 2016

## RESEARCH

My research focuses on reinforcement learning, representation learning, graph neural networks and their applications to vision-based decision-making systems, such as robots and games.

My work about learning composable robot systems with Differentiable Algorithm Networks (DAN) was selected as the **best system paper finalist** and **best student paper finalist** at the *Robotics: Science and Systems* (RSS), 2019.

## PREPRINTS

1. Yang Yue, Bingyi Kang, **Xiao Ma**, Zhongwen Xu, Gao Huang, Shuicheng Yan. "Offline Prioritized Experience Replay", *arXiv preprint arXiv:2306.05412*
2. Bingyi Kang\*, **Xiao Ma**\*, Yirui Wang, Yang Yue, Shuicheng Yan. "Improving and Benchmarking Offline Reinforcement Learning Algorithms", *arXiv preprint arXiv:2306.00972* (\*equal contribution)

## PUBLICATIONS

1. **Xiao Ma**\*, Bingyi Kang\*, Zhongwen Xu, Min Lin, Shuicheng Yan. "Mutual Information Regularized Offline Reinforcement Learning", *Conference on Neural Information Processing Systems (NeurIPS)*, 2023 (\*equal contribution)
2. Bingyi Kang\*, **Xiao Ma**\*, Chao Du, Tianyu Pang, Shuicheng Yan. "Efficient Diffusion Policies for Offline Reinforcement Learning", *Conference on Neural Information Processing Systems (NeurIPS)*, 2023 (\*equal contribution)
3. Jiawei Ren\*, Mingyuan Zhang\*, Cunjun Yu\*, **Xiao Ma**, Liang Pan, Ziwei Liu. "InsActor: Instruction-driven Physics-based Characters", *Conference on Neural Information Processing Systems (NeurIPS)*, 2023 (\*equal contribution)
4. Siwei Chen, **Xiao Ma**, Zhongwen Xu. "Imitation Learning via Differentiable Physics", *Computer Vision and Pattern Recognition (CVPR)*, 2023
5. Siwei Chen\*, Cunjun Yu\*, Yiqing Xu\*, Linfeng Li, **Xiao Ma**, Zhongwen Xu, David Hsu. "Benchmarking Deformable Object Manipulation with Differentiable Physics", *International Conference on Learning Representations (ICLR)*, 2023 (oral, \*equal contribution)
6. Jiawei Ren\*, Cunjun Yu\*, Siwei Chen, **Xiao Ma**, Liang Pan, Ziwei Liu. "DiffMimic: Efficient Motion Mimicking with Differentiable Physics", *International Conference on Learning Representations (ICLR)*,

2023 (\*equal contribution)

7. Wei Qiu, **Xiao Ma**, Bo An, Svetlana Obraztsova, Shuicheng Yan, Zhongwen Xu. “RPM: Generalizable Behaviors for Multi-Agent Reinforcement Learning”, *International Conference on Learning Representations (ICLR)*, 2023
8. Hai Nguyen\*, Zhihan Yang\*, Andrea Baisero, **Xiao Ma**, Robert Platt, Christopher Amato. “Hierarchical Reinforcement Learning under Mixed Observability”, *Workshop on the Algorithmic Foundations of Robotics (WAFR)*, 2022 (\*equal contribution)
9. **Xiao Ma**, David Hsu, Wee Sun Lee. “Learning Latent Graph Dynamics for Visual Manipulation of Deformable Objects”, *International Conference on Robotics and Automation (ICRA)*, 2022
10. Daisheng Jin\*, **Xiao Ma**\*, Chongzhi Zhang, Yizhuo Zhou, Jiashu Tao, Mingyuan Zhang, Zhoujun Li, Xiaolong Liu. “Towards Overcoming False Positives in Visual Relationship Detection”, *British Machine Vision Conference (BMVC)*, 2021 (\*equal contribution)
11. **Xiao Ma**, Siwei Chen, David Hsu, Wee Sun Lee. “Contrastive Variational Model-Based Reinforcement Learning for Complex Observations”, *The 4th Conference on Robot Learning (CoRL)*, 2020
12. Jiawei Ren, Cunjun Yu, Shunan Sheng, **Xiao Ma**, Haiyu Zhao, Shuai Yi, Hongsheng Li. “Balanced Meta-Softmax for Long-Tailed Visual Recognition”, *Advances in Neural Information Processing Systems (NeurIPS)*, 2020
13. Siwei Chen, **Xiao Ma**, David Hsu. “DinerDash Gym: A Benchmark for Policy Learning in High-Dimensional Action Space”, *In IL workshop, Robotics: Science and Systems (RSS)*, 2020
14. Cunjun Yu\*, **Xiao Ma**\*, Jiawei Ren, Haiyu Zhao, Shuai Yi. “Spatio-Temporal Graph Transformer Networks for Pedestrian Trajectory Prediction”, *European Conference on Computer Vision (ECCV)*, 2020 (\*equal contribution)
15. Zuowu Zheng, Xiaofeng Gao, **Xiao Ma**, Guihai Chen. “Predicting Hot Events in the Early Period through Bayesian Model for Social Networks”, *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 2020
16. **Xiao Ma**, Peter Karkus, David Hsu, Wee Sun Lee, Nan Ye. “Discriminative Particle Filter Reinforcement Learning for Complex Partial Observations”, *International Conference on Learning Representations (ICLR)*, 2020
17. **Xiao Ma**\*, Peter Karkus\*, David Hsu, Wee Sun Lee. “Particle Filter Recurrent Neural Networks”, *AAAI Conference on Artificial Intelligence (AAAI)*, 2020 (\*equal contribution)
18. Peter Karkus, **Xiao Ma**, David Hsu, Leslie Pack Kaelbling, Wee Sun Lee, Tomas Lozano-Perez. “Differentiable Algorithm Networks for Composable Robot Learning”, *Robotics: Science and Systems (RSS)*, 2019 (Best Student/System Paper Finalist)
19. **Xiao Ma**, Peter Karkus, David Hsu, Wee Sun Lee “PF-LSTM: Belief State Particle Filter for LSTM”, *In RLPO Workshop, Advances in Neural Information Processing Systems (NeurIPS)*, 2018
20. **Xiao Ma**, Xiaofeng Gao, Guihai Chen. “BEEP: a Bayesian perspective Early state Event Prediction model for online social networks”, *IEEE International Conference on Data Mining (ICDM)*, 2017
21. **Xiao Ma**, Zhenzhe Zheng, Fan Wu and Guihai Chen. “Trust-Based Time Series Data Model for Mobile Crowdsensing”, *IEEE International Conference on Communications (ICC)*, 2017

## AWARDS

NUS School of Computing Research Achievement Award	2020
<i>Robotics: Science and Systems</i> Best Student Paper Finalist	2019
<i>Robotics: Science and Systems</i> Best System Paper Finalist	2019
NUS Research Scholarship	2017
Excellent Project of the <i>National Undergraduate Training Programs for Innovation</i>	2016
Academic Excellence Scholarship, SJTU	2016, 2014

## PROFESSIONAL ACTIVITIES

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### Reviewer

- Conferences: NeurIPS (2020 - 2024), WACV (2021 - 2023), ICRA (2021 - 2023), AAAI (2021 - 2023), CVPR (2021 - 2023), ICLR (2022 - 2023), ICML (2022 - 2024)
- Journals: RA-L (2021 - 2023)

### Teaching

- CS3243: Introduction to Artificial Intelligence (Spring 2018)
- CS6244: Robot Motion Planning and Control (Winter 2018)
- CS5478: Intelligent Robots: Algorithms and Systems (Spring 2020)