Haoran He

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🎓 Education

Hong Kong University of Science and Technology, Hong Kong   2024.2 – Present
Ph.D. student in Electronic and Computer Engineering

Shanghai Jiao Tong University (SJTU), Shanghai, China   2019.9 – 2023.6
Undergraduate student in Computer Science (CS)

🌐 Interests

I am a second-year Ph.D. student at Hong Kong University of Science and Technology, advised by Prof. Ling Pan. I received my bachelor Degree at Shanghai Jiao Tong University in June 2023, advised by Prof. Weinan Zhang and Prof. Yong Yu.

My goal is to develop an intelligent decision-making system that possesses optimality, generalizability, interpretability and robustness. To achieve this, I primarily focus on:

- Generalist Reinforcement Learning and its application in the real world.
- Generative models (e.g., flow and diffusion models) and their applications.
- Large foundation models for reasoning and decision-making.

📄 Publications

See full list in my Google Scholar profile

- Large-Scale Actionless Video Pre-Training via Discrete Diffusion for Efficient Policy Learning
  Haoran He, Chenjia Bai, Ling Pan, Weinan Zhang, Bin Zhao, Xuelong Li.
  NeurIPS 2024

- Regularized Conditional Diffusion Model for Multi-Task Preference Alignment
  Xudong Yu, Chenjia Bai, **Haoran He**, Changhong Wang, Xuelong Li.
  NeurIPS, 2024

- Bridging the Sim-to-Real Gap from the Information Bottleneck Perspective
  Haoran He, Peilin Wu, Chenjia Bai, Hang Lai, LingXiao Wang, Ling Pan, Xiaolin Hu, Weinan Zhang.
  CoRL, 2024

- SAM-E: Leveraging Visual Foundation Model with Sequence Imitation for Embodied Manipulation
  Junjie Zhang, Chenjia Bai, **Haoran He**, Wenke Xia, Zhigang Wang, Bin Zhao, Xiu Li, Xuelong Li.
  ICML 2024

- Robust Quadrupedal Locomotion via Risk-Averse Policy Learning
  Jiyuan Shi, Chenjia Bai, **Haoran He**, Lei Han, Dong Wang, Bin Zhao, Xiu Li, Xuelong Li.
  ICRA 2024

- Diffusion Model is an Effective Planner and Data Synthesizer for Multi-Task Reinforcement Learning
  Haoran He, Chenjia Bai, Kang Xu, Zhuoran Yang, Weinan Zhang, Dong Wang, Bin Zhao, Xuelong Li.
  NeurIPS 2023

- Looking Backward: Retrospective Backward Synthesis for Goal-Conditioned GFlowNets
  Haoran He, Can Chang, Huazhe Xu, Ling Pan
  preprint (under review)

- Rectifying Reinforcement Learning for Reward Matching
  Haoran He, Emmanuel Bengio, Qingpeng Cai, Ling Pan.
  preprint (under review)

- On the Value of Myopic Behavior in Policy Reuse
  Kang Xu, Chenjia Bai, Shuang Qiu, **Haoran He**, Bin Zhao, Zhen Wang, Wei Li, Xuelong Li.
  preprint (under review in TPAMI 2024, Major Revision)

- Diffusion Models for Reinforcement Learning: A Survey
  Zhengbang Zhu, Hanye Zhao, **Haoran He**, Yichao Zhong, Shenyu Zhang, Haoquan Guo, Tingting Chen, Weinan Zhang.
  preprint, 2024

👥 EXPERIENCE

Intern at Tencent AI Lab   Sep. 2024 – Present

Role: Member of the RL group

Brief introduction: Research on world models for policy generalization. Advised by Dr. Zhongwen Xu.

- We are building a generalist video-based world model as an environmental simulator.
- We are building an effective model-based learning algorithm to learn well-performed policies across different environments.

Intern at Shanghai AI Lab   Oct. 2022 – Feb. 2024

Role: Member of the RL group

Brief introduction: Research on generalist reinforcement learning and robotics. Advised by Dr. Chenjia Bai.

- Aims to master quadruped locomotion task via a novel RL method. Adversarial methods for domain adaptation(e.g. sim2real) and skill discovery for performance boosting are proven to be effective.
- Learn a single policy that can tackle multiple tasks from the collected offline data.
- Proposed a new model named MTDIFF, which is trained on large-scale datasets for multi-task decision-making.
- Proposed a new model named VPDD, which is a generalist video-based multi-task agent pre-trained on large-scale human videos.

⚙ SKILLS

- Programming Languages: C == C++ == Python > Rust
- Platform: Linux or Windows
- Tools: git for code management and ArcGis for geographic information system; Pytorch and Tensorflow for conducting machine learning experiments and designing neural networks
- Development: Machine learning, Reinforcement Learning, Data Analysis

♡ HONORS AND AWARDS

1ˢᵗ Prize in school robocup competition	2019
Merit Student in SJTU	2020
Cosco shipping scholarship	2020
Honorable Mention in Mathematical Contest In Modeling	2020
C-class Excellent Scholarship	2021
Merit Student in SJTU	2022
B-class Excellent Scholarship	2022
PostGraduate Scholarship	2024

ⓘ MISCELLANEOUS

- GitHub: `https://github.com/tinnerhrhe`
- personal page: `https://tinnerhrhe.github.io`
- Languages: English - Fluent, Mandarin - Native speaker
- Hobbies: Running, playing ping pong, and reading.