

Zilin Wang

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Research Interest

My research goal is to construct general decision-making system capable of interacting with complex environments. Currently, I focus on Deep Reinforcement Learning (RL) as a solution method. Specifically, my research interest lies in the representation learning and alignment in Deep RL. Furthermore, I also apply RL to a range of practical applications, notably in the realms of content generation and robot learning.

Education

Tsinghua University

Master of Computer Engineering

Beijing, China

Sept 2021 - Jun 2024

- **Research Interest:** Deep Reinforcement Learning and its applications
- **Advisor:** Zhiyong Wu

Dalian University of Technology

Bachelor of Digital Media and Technology

Dalian, China

Sept 2017 - Jun 2021

- **GPA:** 4.08/5.00
- **Rank:** 1/77
- **Courses:** Machine Learning (A+), Computer Vision (A+), Computer Graphics (A+), Speech Processing (A+), Software Engineering (A+), Computer network (A+), Graduation Defense (A+)

Research Experiences

Visual Reinforcement Learning Group, Tsinghua University

Visual Reinforcement Learning

Shenzhen, China

Feb 2023 - Current

- Investigation on sample-efficiency and generalization in Visual Reinforcement Learning.
- A paper "*Learning Better with Less: Effective Augmentation for Sample-Efficient Visual Reinforcement Learning*" is accepted by NeurIPS 2023.

Human Computer Interaction Lab, Tsinghua University

Reinforcement Learning for Motion Generation

Shenzhen, China

Feb 2023 - Aug 2023

- Speech-driven 3D dance and gesture generation.
- Investigation on how to improve motion diversity and quality by reinforcement learning and inverse reinforcement learning.
- A paper "*UnifiedGesture: A Unified Gesture Synthesis Model for Multiple Skeletons*" is accepted by ACM MM 2023 (Oral).
- A paper "*Explore 3D Dance Generation via Reward Model from Automatically-Ranked Demonstrations*" is accepted by AAAI 2024.

OpenDILab, Shanghai AI Lab

Deep Reinforcement Learning

Shanghai, China

May 2022 - Jan 2023

- Development of *DI-engine*, a reinforcement learning algorithm framework. Including development of algorithms, e.g., *decision transformer*, *MAPPPO* and environments, e.g., *Multiple Particle Environment (MPE)*, *Starcraft Multi-Agent Challenge (SMAC)*.
- Exploration and development of multi-agent reinforcement learning algorithms.
- Development of *DI-adventure*, a Reinforcement Learning beginners adventure, which was selected as a final assignment for the Big Data Analytics B course at Tsinghua University.

Publications and Pre-Prints

SELECTED

Explore 3D Dance Generation via Reward Model from Automatically-Ranked Demonstrations

Zilin Wang, Zhuang Haolin, Lu Li, Yinmin Zhang, Junjie Zhong, Jun Chen, Yu Yang, Boshi Tang, Zhiyong Wu

The 38th Annual AAAI Conference on Artificial Intelligence (AAAI) (Acceptance rate: 23.75%), 2024

A Synthetic Corpus Generation Method For Neural Vocoder Training

Zilin Wang, Peng Liu, Jun Chen, Sipan Li, Jinfeng Bai, Gang He, Zhiyong Wu, Helen Meng

ICASSP 2023-2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2023

UnifiedGesture: A Unified Gesture Synthesis Model for Multiple Skeletons

Sicheng Yang*, Zilin Wang* (equal contribution), Zhiyong Wu, Minglei Li, Zhensong Zhang, Huang Qiaochu, Lei Hao, Songcen Xu, Xiaofei Wu, Changpeng Yang, Dai Zonghong

31st ACM International Conference on Multimedia (ACM MM) (Oral) (Oral rate: 5.39%), 2023

FullSubNet+: Channel attention fullsubnet with complex spectrograms for speech enhancement

Jun Chen, Zilin Wang, Deyi Tuo, Zhiyong Wu, Shiyin Kang, Helen Meng

ICASSP 2022-2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (citation 60+), 2022

OTHERS

Normalization Enhances Generalization in Visual Reinforcement Learning

Lu Li, Jiafei Lyu, Guozheng Ma, **Zilin Wang**, Zhenjie Yang, Xiu Li, Zhiheng Li
International Conference on Autonomous Agents and Multiagent Systems (AAMAS) (Oral), 2024

MC-SpEx: Towards Effective Speaker Extraction with Multi-Scale Interfusion and Conditional Speaker Modulation

Jun Chen, Wei Rao, **Zilin Wang**, Jiuxin Lin, Yukai Ju, Shulin He, Yannan Wang, Zhiyong Wu
INTERSPEECH (2023). 2023

Distance-rank Aware Sequential Reward Learning for Inverse Reinforcement Learning with Sub-optimal Demonstrations

Lu Li, Yuxin Pan, Ruobing Chen, Jie Liu, **Zilin Wang**, Yu Liu, Zhiheng Li
Preprint, 2023

Learning Better with Less: Effective Augmentation for Sample-Efficient Visual Reinforcement Learning

Guozheng Ma, Linrui Zhang, Haoyu Wang, Lu Li, **Zilin Wang**, Zhen Wang, Li Shen, Xueqian Wang, Dacheng Tao
37th Conference on Neural Information Processing Systems (NeurIPS) (Acceptance rate: 26.1%), 2023

SSI-Net: A Multi-Stage Speech Signal Improvement System for ICASSP 2023 SSI Challenge

Weixin Zhu, **Zilin Wang**, Jiuxin Lin, Zheng Chang, Yu Tao
ICASSP 2023-2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) (oral) (2023). 2023

Location-Aware Feature Selection Text Detection Network

Zengyuan Guo*, **Zilin Wang*** (equal contribution), Zhihui Wang, Wanli Ouyang, Haojie Li, Wen Gao
Preprint, 2020

Awards and Fellowships

2023	Excellent Teaching Assistant (top 5%) , Teaching Assistant Award	China
2021	Outstanding Graduate (top 1%) , Graduation	China
2020	Bachelor National Scholarship (top 1%) , National Scholarship	China
2020	First Class Study Excellence Scholarship (top 5%) , Study Excellence Scholarship	China
2020	Spiritual Civilization Scholarship (top 5%) , Spiritual Civilization Award	China
2019	First Class Study Excellence Scholarship (top 5%) , Study Excellence Scholarship	China
2019	Spiritual Civilization Scholarship (top 5%) , Spiritual Civilization Award	China
2019	Winner (5 awarded in worldwide) , JASSO Scholarship	Japan
2018	First Class Study Excellence Scholarship (top 5%) , Study Excellence Scholarship	China
2018	Spiritual Civilization Scholarship (top 10%) , Spiritual Civilization Award	China
2018	Lingshui Scholarship Winner (top 3%) , Lingshui Scholarship	China

Teaching Experiences

Big Data Analysis

Tsinghua University

Shenzhen, China

Fall 2022 & 2023

Winner of Excellent teaching assistant award of Tsinghua University. Lecturing the Reinforcement Learning part, as well as designing and implementing the final project codebase.

Software Engineering

Dalian University of Technology

Dalian, China

Spring 2019

Teaching assistant, lecturing the Android application development.

Open-source repositories

DI-engine

A generalized decision intelligence engine for PyTorch and JAX

2.7k stars

Contributed about 5,000 lines of code

It provides python-first and asynchronous-native task and middleware abstractions, and modularly integrates several of the most important decision-making concepts: Env, Policy and Model.

DI-adventure

Decision intelligence adventure for beginners

50+ stars

Completed the vast majority of the code

Explore the representation learning in Visual Reinforcement Learning.

synthetic-corpus-vocoder

The implementation of a proposed synthetic corpus

16 stars

Creator and maintainer

A synthetic corpus generation method for neural vocoder training, which can easily generate synthetic audio with an unlimited number at low cost. Neural vocoders trained with the synthetic corpus can generalize to many scenarios without training on real audio.