Zilin Wang

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Research Interest

My research focuses on developing general decision-making agents capable of interacting with complex and dynamic environments. Currently, I am exploring **Deep Reinforcement Learning (Deep RL)** as a core solution methodology. Furthermore, I also apply Deep RL to a range of practical applications, notably in the realms of content generation and autonomous driving.

Education

University of Oxford   *Oxford, UK*

DPhil in Computer Science   *Sept 2024 - April 2028 (Expected)*

- **Research Interest:** Deep Reinforcement Learning and Autonomous Driving
- **Advisor:** Prof. Shimon Whiteson and Prof. Jakob Foerster

Tsinghua University   *Beijing, China*

Master of Computer Technology   *Sept 2021 - Jun 2024*

- **Research Interest:** Applied Machine Learning: Content Generation, Speech Processing
- **Advisor:** Prof. Zhiyong Wu

Dalian University of Technology   *Dalian, China*

Bachelor of Digital Media and Technology   *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

Lingjun Investment   *Beijing, China*

Quantitative Research   *Jun 2024 - Sept 2021*

- Research on Stock Price Prediction by Deep Learning.
- Research on the application of Reinforcement Learning in Portfolio Management.

Human Computer Interaction Lab, Tsinghua University   *Shenzhen, China*

Reinforcement Learning for Motion Generation   *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"* was accepted by ACM MM 2023 (Oral).
- A paper *"Explore 3D Dance Generation via Reward Model from Automatically-Ranked Demonstrations"* was accepted by AAAI 2024.

Division of Information Science and Technology, Tsinghua University   *Shenzhen, China*

Visual Reinforcement Learning   *Feb 2023 - May 2023*

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

OpenDILab, Shanghai AI Lab   *Shanghai, China*

Deep Reinforcement Learning   *May 2022 - Jan 2023*

- Development of DI-engine, a reinforcement learning algorithm framework. Including development of algorithms, *e.g.*, decision transformer, MAPPO 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.

AI Lab, Tencent   *Shenzhen, China*

Speech Processing   *Nov 2021 - Apr 2022*

- Research on Speech Processing and Speech Synthesis.
- A paper *"A Synthetic Corpus Generation Method for Neural Vocoder Training"* was accepted by ICASSP2023 (top conference of Speech Processing).

MMLab, Dalian University of Technology   *Dalian, China*

Scene Text Detection   *Sept 2020 - May 2021*

- Research on Computer Vision and Scene Text Detection.
- A paper *"Location-Aware Feature Selection Text Detection Network"* was completed

Publications

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*

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*

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*

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*

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), 2022

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 (Student Exchange Support Program)**, 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 *Shenzhen, China*
Tsinghua University *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.

Open-source repositories

DI-engine *Shanghai, China*
A generalized decision intelligence engine for PyTorch and JAX *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 *Shanghai, China*
Decision intelligence adventure for beginners *Completed the vast majority of the code*
Explore the representation learning in Visual Reinforcement Learning.

synthetic-corpus-vocoder *Shenzhen, China*
The implementation of a proposed synthetic corpus *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.