

# 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 autonomous driving and content generation.

## Education

### University of Oxford

DPhil Student in Computer Science

Oxford, UK

Oct 2024 - April 2028 (Expected)

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

### Tsinghua University

Master of Computer Technology

Beijing, China

Sept 2021 - Jun 2024

- **Research Interest:** Content Generation and Speech Processing
- **Advisor:** Prof. 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

### Lingjun Investment

Quantitative Research

Beijing, China

Jun 2024 - Sept 2024

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

### 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*" 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

Visual Reinforcement Learning

Shenzhen, China

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

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**, **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

Speech Processing

Shenzhen, China

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

Scene Text Detection

Dalian, China

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	<b>Excellent Teaching Assistant (top 5%)</b> , Teaching Assistant Award	China
2021	<b>Outstanding Graduate (top 1%)</b> , Graduation	China
2020	<b>Bachelor National Scholarship (top 1%)</b> , National Scholarship	China
2020	<b>First Class Study Excellence Scholarship (top 5%)</b> , Study Excellence Scholarship	China
2020	<b>Spiritual Civilization Scholarship (top 5%)</b> , Spiritual Civilization Award	China
2019	<b>First Class Study Excellence Scholarship (top 5%)</b> , Study Excellence Scholarship	China
2019	<b>Spiritual Civilization Scholarship (top 5%)</b> , Spiritual Civilization Award	China
2019	<b>Winner (Student Exchange Support Program)</b> , JASSO Scholarship	Japan
2018	<b>First Class Study Excellence Scholarship (top 5%)</b> , Study Excellence Scholarship	China
2018	<b>Spiritual Civilization Scholarship (top 10%)</b> , Spiritual Civilization Award	China
2018	<b>Lingshui Scholarship Winner (top 3%)</b> , 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.