Ziye Wang

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Research interest: 3D Gaussian Splatting, Embodied AI, 3D World Model,
Multi-modal Learning, AI for Remote Sensing

EDUCATION

Harbin Institute of Technology (Shenzhen)   Sep. 2021 – Jan. 2024

GPA: 3.2/4.0

Master in Computer Science and Technology

Harbin Institute of Technology (Shenzhen)   Sep. 2017 – Jun. 2021

GPA: 3.7/4.0 (2/123 in junior)

Bachelor in Computer Science and Technology

PUBLICATION

Ziye Wang, Yiran Qin, Lin Zeng, Ruimao Zhang. High-Dynamic Radar Sequence Prediction for Weather Nowcasting Using Spatiotemporal Coherent Gaussian Representation. The Thirteenth International Conference on Learning Representations (ICLR), 2025. (Oral)

- A pre-research for 3D world model: re-represent high-dynamic 3D radar sequence as spatiotemporal coherent and predictable 3D Gaussians for practicable 3D prediction

Ziye Wang, Xutao Li, Kenghong Lin, Chuyao Luo, Yunming Ye, Xiuqing Hu. Multiscale and Multilevel Feature Fusion Network for Quantitative Precipitation Estimation With Passive Microwave. IEEE Transactions on Geoscience and Remote Sensing, vol. 62, pp. 1-16, 2024

- A CNN and ViT hybrid architecture to model the complex relationship between satellite observations and the precipitation process

Ziye Wang, Guangbo Deng, Kenghong Lin, Chuyao Luo, Xutao Li, Yunming Ye. Domain Diffusion for Large-Scale Quantitative Precipitation Estimation with Visible and Infrared Observations. *Submitted to* IEEE Transactions on Geoscience and Remote Sensing

- Reformulate large-scale and high-resolution precipitation estimation as a domain diffusion to model the implicit relationship and overall distribution

RESEARCH EXPERIENCE

3D World Model based on Manipulable and Predictable Gaussians   Current

- Implicitly reconstruct complex 3D scenes based on manipulable and predictable 3D Gaussians with sparse multi-view videos
- Latent Gaussian-based conditioned prediction model for deformation prediction and generation based on current 3D scene state and task prompt

Spatiotemporal Coherent Gaussian Representation for 3D Sequence Prediction (ICLR Oral)   2024

- Develop the first practicable framework for high-resolution and high-dynamic 3D sequence reconstruction and prediction
- Re-represent high-dynamic 3D radar sequence as spatiotemporal coherent and predictable Gaussian groups, utilizing our proposed bidirectional Gaussian reconstruction pipeline with local motion and global trend constrains
- Integrates a memory mechanism into the Mamba framework, enabling our proposed GauMamba to learn the temporal evolution of Gaussian groups while efficiently handling a large volume of Gaussian tokens
- Reprogram the CUDA kernel for Radar Gaussian Splatting using CUDA C++.

An Unified Framework for Multi-Modal Learning and Super-Resolution Imaging with 2D Gaussian   2024

- Re-represent various remote sensing observations into a unified 2D Gaussian group to enable efficient multi-modal learning and retrieval of multi-meteorological factors

- Implement Gaussian position-based transformations to achieve pixel-level spatial matching for observations from multiple sources and obtain reconstructed outputs accommodating arbitrarily arranged formats

Satellite-Based Precipitation Estimation Model (TGRS)   2022 – 2023

- Develop a Multi-Scale and Multi-Level Feature Fusion Network (MSMLNet) for quantitative precipitation estimation based on passive microwave observations
- Design a hybrid architecture integrating CNN and ViT to model the complex relationship between microwave observations and precipitation process
- Propose a multi-level sub-module to adaptively distinguish precipitation levels and extract features independently addressing the issues caused by the skew distribution of precipitation

Domain Diffusion for Large-Scale and High-Resolution Precipitation Estimation (TGRS)   2022 – 2023

- Reformulate large-scale and high-resolution precipitation estimation as a directed domain translation from observation domain to precipitation domain
- Address the accuracy challenges posed by the lack of direct correlation between observations and precipitation, and the complicated numerical and spatial distribution of precipitation across the Earth.

PROFESSIONAL EXPERIENCE

The Chinese University of Hong Kong, Shenzhen   Apr. 2024 – Jan. 2025

Research Assistant
Supervisor Ruimao Zhang

PROJECT EXPERIENCE

Social Network Analysis based on Weibo   2021

- Construct a social network with millions of users based on user's following and follower information, and gather over one million Weibo posts to generate a corpus based on Weibo content
- Employ Python for web scraping, ensuring efficiency by implementing cache files and resumable scraping

Stylistic Conversational Chatbot using DialoGPT   2021

- Construct a corpus of 300,000 dialogues by cracking and extracting chat records from the WeChat database
- Fine-tune the DialoGPT pre-trained model to learn stylistic language patterns

HONORS & AWARDS

First Prize of China Undergraduate Mathematical Contest in Modeling	2019
First Prize Scholarship, Second Prize Scholarship	2019 – 2022
Outstanding League Cadres	2019 – 2020

SKILLS

- Competent in NVIDIA CUDA C++ Programming, capable of programming and modifying CUDA kernels
- Proficient in Python, PyTorch and PyTorch Lighting
- Proficient in Neo4j, NetworkX, D3.js, etc., capable of handling, visualizing and applying unstructured data

LEADERSHIP EXPERIENCE

Student Union   Oct 2020 – Oct 2021

President   Harbin Institute of Technology (Shenzhen)

- Spearheaded student union reform and successfully organized the student congress.
- Managed large-scale events and enhanced visibility through social media, significantly engaging the student body

Shenzhen Anti-Corruption Commission   Jul 2019 – Jul 2020

Integrity Ambassador