Ziyu Sun

sunzy2121@mails.jlu.edu.cn | +86 18252713135 | Changchun, Jilin, China 130012

My GitHub: https://github.com/Zysun2002

EDUCATION

Jilin University (Project 985&211)   Jilin, China

Bachelor of Science Candidate (Expected 2025)   Sept. 2021-Jun. 2025

Tang Ao-qing Honors Program in Computer Science, **GPA 3.93/4.0, 93.55/100**

Relevant Coursework: Mathematical Analysis I (99), II (96), III (99), Probability and Statistics A (95.5), Linear Algebra A (94), Discrete Mathematics I (94), Space Analytic Geometry (98), Object Oriented Program Design (95.8).

RESEARCH EXPERIENCE

Towards a Fully Customized Renderer for MecSimCalc   Alberta, Canada

3-month Research Internship Program, University of Alberta   Jul. 2024-Oct. 2024

- Implemented the graphics pipelines (both rasterization and ray tracing) to build a renderer.
- Enhanced rendering quality by utilizing techniques such as ambient occlusion mapping and shadow mapping.
- This further strengthened my coding skills in computer graphics. The project is available here.

From Incomplete Coarse-Grained to Complete Fine-Grained: A Two-Stage Framework for Spatiotemporal Data Reconstruction   Jilin, China

Tang Ao-qing Honors Program Research Supervised by Prof. Wenbin Liu, Jilin University   Jan. 2024-Jul. 2024

- Introduced generative models from CV (computer vision) into spatiotemporal data mining.
- Proposed a novel task called spatial-temporal data reconstruction. Enhanced our two-stage diffusion model with spatial-temporal attention and time-series processing capabilities through improvements to the denoising network at each stage.
- Achieved state of the art performance compared with seven benchmark methods across three datasets in three task settings.
- This is my attempt to combine computer vision with spatiotemporal data mining. The paper is available here.

Dynamic 3D Gaussian Prediction for Motion Extrapolation and Free View Synthesis   Zhejiang, China

Research Supervised by Prof. Zhaopeng Cui, CAD & CG, Zhejiang University   Nov. 2023-Jan. 2024

- Acquired foundational knowledge in computer graphics & vision under the guidance of Prof. Rui Ma, Jilin University.
- Implemented the extrapolation stage of our 3D Gaussian Splatting model, achieving satisfactory results across most datasets.
- Assisted in training the reconstruction stage of our 3D Gaussian Splatting model, enhancing model performance.
- This is my academic exploration in neural rendering. The paper is available here.

Application of Wavelet Transforms in Image Processing and Graphics   Alberta, Canada

Summer Program Research Supervised by Prof. Bin Han, University of Alberta   Jul. 2023-Aug. 2023

- Gained knowledge on wavelet theory and its application in image processing and computer graphics.
- Compared wavelet transform-based image processing methods with deep learning-based algorithms.
- Analyzed the source code of the Wavelet Toolbox in MATLAB and implemented a Python version.
- This is my start of interest in computer graphics.

Towards Time-Continuous Data Inference in Sparse Urban CrowdSensing   Jilin, China

Tang Ao-qing Honors Program Research Supervised by Prof. Wenbin Liu, Jilin University   Jan. 2022-Jul. 2023

- Developed a broad range of research skills and started with the first leading research project.
- Challenged a widely existing assumption in spatiotemporal data mining by introducing a novel method called TIME-DMF.
- Progressed from DMF to RNN-DMF to TIME-DMF through a step-by-step approach, introducing a novel encoder, time-gates, and a new completion strategy.
- Conducted experiments of five types on four datasets with seven benchmark methods to prove model efficiency.
- This work was submitted to INFOCOM 2024 and received a review score of 3222 out of 4, but was unfortunately rejected.
- This is my first leading research project. The paper is available here.

PUBLICATIONS & PREPRINTS

(Conference article) Boming Zhao, Yuan Li, **Ziyu Sun**, et al, "Dynamic 3D Gaussian Prediction for Motion Extrapolation and Free View Synthesis" **SIGGRAPH 2024**. Accepted.

(Journal article) **Ziyu Sun**, Wenbin Liu, et al, "Toward Time-Continuous Data Inference in Sparse Urban CrowdSensing" **IEEE Internet of Things Journal**. Submitted.

(Journal article) **Ziyu Sun**, Wenbin Liu, et al, "From Incomplete Coarse-Grained to Complete Fine-Grained: A Two-Stage Framework for Spatiotemporal Data Reconstruction" **IEEE Transactions on Knowledge and Data Engineering**. Submitted.

HONORS &AWARDS

Tang Ao-qing Scholarship	Mar. 2023
Tang Ao-qing Honors Program Second Class Scholarship (Top 3 in the major)	Dec. 2023
Jilin University Liberation Navigator Scholarship (Top 20 out of Jilin University)	Nov. 2023
19th CCF Conference on Information Systems and Applications Innovative Design Competition, 4th Place in China	Feb. 2022

SKILLS

Language: Chinese(native), English (with IELTS overall score of 7.5 and band score of 6.5)

Programming Language: Python, C/C++, MATLAB, Java

Professional Skill: PyTorch, Latex, Cuda, Git