RESEARCH RESUME

Ruixiang Xue 薛瑞翔

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> **Targeted for research and algorithm roles in point cloud compression, 3D Gaussian splatting compression, neural scene representation, driving world models, and AI multimedia systems.**

EDUCATION

Nanjing University — 2021.09 - 2027.06

Ph.D. Student, Information and Communication Engineering

- NJU Vision Lab, advised by Prof. Zhan Ma and Researcher Tong Chen
- Research fields: **intelligent point cloud compression**, **3D Gaussian splatting compression**, **implicit neural representations**, and **AI-assisted photography**
- **Excellent** result in doctoral mid-term assessment

Hangzhou Dianzi University — 2017.09 - 2021.06

B.Eng. in Electronic Information Engineering

WORK EXPERIENCE

Geely — 2026.05 - Present

Artificial Intelligence Center · Algorithm Intern - Research on street-scene novel-view extrapolation with mutual enhancement between feed-forward reconstruction and generative models.

- Used feed-forward street-scene reconstruction to improve the geometric consistency of generative novel-view synthesis models.
- Leveraged generative priors to improve the rendering-quality loss for feed-forward street-scene reconstruction under large-baseline novel-view extrapolation.

OPPO — 2024.02 - 2024.11

Research Institute · Algorithm Intern - Worked on intelligent point cloud compression research and MPEG AI-PCC standardization.

- Developed and evaluated intelligent point cloud compression algorithms around MPEG AI-PCC standardization.
- Implemented point cloud codec software and evaluated performance across standard test sequences.
- Participated in multiple MPEG meetings, submitted **8** standardization proposals, and filed **5** invention patents.

RESEARCH PROJECTS

Intelligent Point Cloud Compression

Research and development of deep learning based point cloud compression methods for MPEG AI-PCC.

- Designed Transformer models for point cloud representation and efficient spatial feature extraction.
- Used density changes during point cloud downsampling to guide reconstruction mode selection.
- Achieved 39% geometry compression gain and 34% attribute compression gain over the baseline under public test conditions.

3D Gaussian Splatting Coding

Compact and progressive compression for 3D Gaussian splatting scenes.

- Investigated compactification, compression, and reconstruction methods for 3D Gaussian splatting.
- Proposed RecastGS to reorganize pretrained 3DGS into a region-aware layered hierarchy with prompt-driven object extraction and progressive distillation.
- Proposed LayeredCGS, a feed-forward layered 3DGS compressor with cross-layer context modeling and truncatable bitstreams.

Street Generative Novel-View Synthesis

Feed-forward street-scene reconstruction and generative-prior assisted large-baseline novel-view extrapolation.

- Used feed-forward reconstruction to improve geometric consistency in generative novel-view synthesis.
- Leveraged generative priors to improve rendering-quality losses for feed-forward reconstruction.
- Targeted large-baseline street-scene novel-view extrapolation under practical autonomous-driving scenarios.

SELECTED PUBLICATIONS

3D Gaussian Splatting Compression with Object Scalability

Ruixiang Xue, Tong Chen, Zhan Ma. **ECCV 2026 · Accepted, not yet on arXiv**

- Introduced RecastGS, a post-training method that reorganizes pretrained 3DGS into a region-aware layered hierarchy for object-level and ROI-adaptive quality control.
- Introduced LayeredCGS, a feed-forward layered 3DGS compressor that models cross-layer dependencies and generates truncatable bitstreams for fast preview and progressive refinement.

A Versatile Point Cloud Compressor Using Universal Multiscale Conditional Coding – Part I: Geometry

Jianqiang Wang, Ruixiang Xue, Jiaxin Li, Dandan Ding, Yi Lin, Zhan Ma. **TPAMI · SCI Q1, CCF-A, impact factor 18.6, co-first author**

- Proposed a universal multiscale conditional point cloud geometry coding framework supporting lossy/lossless, static/dynamic, and diverse point cloud data.
- Outperformed MPEG G-PCC, V-PCC, and learning-based methods with second-level codec complexity; improved lossless compression by 30% and lossy compression by 92% overall.

NeRI: Implicit Neural Representation of LiDAR Point Cloud Using Range Image Sequence

Ruixiang Xue, Jiaxin Li, Tong Chen, Dandan Ding, Xun Cao, Zhan Ma. **ICASSP 2024 · CCF-B, first author**

- Proposed the first implicit neural representation method for LiDAR point cloud compression by converting 3D point clouds into 2D range images and coding them with spatiotemporal conditional neural networks.
- Reached 376 FPS real-time decoding and achieved 91% overall gain at low bitrates over MPEG G-PCC, HEVC, and other learning-based point cloud compression methods.

A Versatile Point Cloud Compressor Using Universal Multiscale Conditional Coding – Part II: Attribute

Jianqiang Wang, Ruixiang Xue, Jiaxin Li, Dandan Ding, Yi Lin, Zhan Ma. **TPAMI · SCI Q1, CCF-A, impact factor 18.6, second author**

GRNet: Geometry Restoration for G-PCC Compressed Point Clouds Using Auxiliary Density Signaling

Gexin Liu, Ruixiang Xue, Jiaxin Li, Dandan Ding, Zhan Ma. **TVCG · SCI Q1, CCF-A, impact factor 6.5, second author**

SKILLS

Codec and Compression: Deep learning based point cloud coding, 3D Gaussian splatting coding, Driving world models, Street-view synthesis and restoration, MPEG AI-PCC standardization, G-PCC and V-PCC

Programming: Python, PyTorch, Linux, AI coding workflows

Communication: CET-6, English presentations at international meetings, Technical literature search and reading

AWARDS

First Prize Scholarship, Nanjing University **2021 - 2025**

Special Prize, 12th Zhejiang College Student Entrepreneurship Plan Competition **2020**