Ruijie Chen

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Google Scolar Github

Education

University of Michigan, Ann Arbor Aug 2024 – Exp. May 2026
M.S. in Electrical and Computer Engineering

Communication University of China Sept 2020 – June 2024
B.E. in Digital Media Technology (GPA: 3.77/4.0)

Research Interests: Generative Models, Multi-Modal AI, Image Compression

Publications

Stable Diffusion is a Natural Cross-Modal Decoder for Layered AI-generated Image Compression.
Ruijie Chen, Qi Mao, Zhengxue Cheng.
Data Compression Conference (**DCC**), 2025, Paper

Scalable Face Image Coding via StyleGAN Prior: Towards Compression for Human-Machine Collaborative Vision.
Qi Mao, Chongyu Wang, Meng Wang, Shiqi Wang, ***Ruijie Chen***, Libiao Jin, Siwei Ma.
IEEE Transactions on Image Processing, 2024 (**TIP**), Paper

Research Experience

State Key Laboratory of Media Convergence and Communication Nov 2022 - Dec 2024
Communication University of China – Beijing, China Advisor: Prof. Qi Mao

Scalable Face Image Coding via StyleGAN Prior

- Evaluated the performance of latest traditional image codecs (HEVC, VVC, etc). Designed a parallel computing toolkit to efficiently compress, decompress and evaluate images using Matlab.
- Finetuned pretrained checkpoints of various learning-based image compression methods (Hific, CompressAI, etc) on the FFHQ dataset and evaluated their performance on popular metircs (PSNR, LPIPS, DISTS, etc.)

Scalable Coding for AI-generated Image based on Stable Diffusion

- Proposed a layered cross-modal compression framework utilizing Stable Diffusion as a cross modal decoder.
- Designed a layered encoder to decompose images into semantic, structure, and texture priors, effectively conveying multiple levels of visual information.
- Outperformed VVC in both visual quality and objective metrics. Further supports seamless local and global image editing by directly manipulating the scalable bitstream, eliminating the need for full decoding.

Internship Experience

Algorithm Intern, DeTool Technology Co., Ltd. – Ningbo, China Jul 2023 – Aug 2023

Extraction and Simulation Software for Power Device Project

- Researched, verified, and adopted open-source implementations of solvers for large sparse linear systems with algebraic multigrid method.
- Designed ablation experiments of coarsening techniques and iterative solvers to identify the optimal parameter combinations; the adopted module outperforms the baseline by a factor of 3 in calculation time.

Data Visualization Tool for Test Data Analyzer Project

- Developed C++/Qt-based modules for data analysis and visualization. Completed UI design and data structure creation.

Skills

Programming Languages: Python, C++, C#, Matlab, Julia, Swift, SQL
Tools & Framework: Pytorch, Qt, Unity, git, LaTeX