

Shilv Cai

Ph.D. in Huazhong University of Science and Technology

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Short Bio -

Dr. Cai received a bachelor's degree from the College of Electrical and Information Engineering, Hunan University, Changsha, China 2018. He is working toward a Ph.D. in Huazhong University of Science and Technology. He is interested in image compression and processing, generative models, and software systems.

Interests —

Image Compression and Processing

Generative Model

Software Systems

Skills -

Programming: Python C C++ Matlab Tools:

Pytorch
Qt Creator
OpenCV
OpenCV

Education

2018 - Now Ph.D. in Artificial Intelligence and Automation

Huazhong University of Science and Technology (HUST, China)

2014 – 2018 B.Sc. in School of Electrical and Information Engineering Hunan University (HNU, China)

Publications

- Shilv Cai, Liqun Chen, Zhijun Zhang, Xiangyun Zhao, Jiahuan Zhou, Yuxin Peng, Luxin Yan, Sheng Zhong, and Xu Zou. I2C: Invertible Continuous Codec for High-Fidelity Variable-Rate Image Compression. IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2024 (Accepted).
- Shilv Cai, Liqun Chen, Sheng Zhong, Luxin Yan, Jiahuan Zhou, and Xu Zou. Make Lossy Compression Meaningful for Low-Light Images. In Proceedings of the 38th AAAI Conference on Artificial Intelligence (AAAI), 2024 (Accepted).
- Shilv Cai, Zhijun Zhang, Liqun Chen, Luxin Yan, Sheng Zhong, and Xu Zou. High-Fidelity Variable-Rate Image Compression via Invertible Activation Transformation. In Proceedings of the 30th ACM International Conference on Multimedia (ACM MM), 2022 (Published).
- **Shilv Cai**, Xiaoguo Liang, Shuning Cao, Luxin Yan, Sheng Zhong, Liqun Chen, and Xu Zou. Powerful Lossy Compression for Noisy Images. (Under review).

Project Experience

2018.072018.12

Real-Time Deployment of Target Detection for Embedded Devices
Template matching based target detection algorithm deployed in real-time on a DSP embedded platform (principal).

2018.10- Development of Data Transmission and Decompression Test Equipment

For low-latency transmission of compressed data, real-time decoding, parsing, BER statistics and comparisons, serving the satellite test phase (principal).

2018.12- Real-time Implementation and Validation of Test Equipment Software Systems

For low-latency transmission of compressed data, real-time decoding, parsing, BER statistics and comparisons, serving the satellite test phase (principal).

2019.04- Operationally Controlled Decompression Equipment Development

2021.06 For low-latency transmission of compressed data, real-time decoding, parsing, and distribution to serve the satellite operation phase (principal).

2020.07 - Deep Learning-Based Lossless/Near-Lossless In-Orbit Compres-2022.07 sion of Infrared Cloud Images

To develop a neural network-based lossless-near-lossless compression method for large-format high-bitwidth infrared satellite cloud images with high efficiency and high fidelity compression in orbit.