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	● ● ● ● ○

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

2018.07- 2018.12	**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- 2021.03	**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- 2020.12	**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- 2021.06	**Operationally Controlled Decompression Equipment Development** For low-latency transmission of compressed data, real-time decoding, parsing, and distribution to serve the satellite operation phase (principal).
2020.07 - 2022.07	**Deep Learning-Based Lossless/Near-Lossless In-Orbit Compression 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.