



## 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.