SHILV(SHILYU) CAI

Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798
shilyu.cai@ntu.edu.sg; caishilv1024@gmail.com | https://caishilv.github.io/Personal-Website

EDUCATION

Huazhong University of Science and Technology, Wuhan, China — Sep. 2018 - Sep. 2024
Ph.D. in School of Artificial Intelligence and Automation

Hunan University, Changsha, China — Sep. 2014 - Jun. 2018
B.Sc. in School of Electrical and Information Engineering

RESEARCH INTERESTS

Image Processing, Image Compression, Image Enhancement

PROFESSIONAL SKILLS

Programming Languages	C/C++, Python, MATLAB
Packages & Library	Pytorch, Opencv, Matplotlib, etc.
Software & Tools	Qt Creator, LaTeX, Excel

PROJECT EXPERIENCE

Learned-Based Lossless/Near-Lossless Images Compression — Jul. 2020 - Jul. 2022
Main Researcher

· 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.

Operationally Controlled Decompression Equipment Development — Apr. 2019 - Jun. 2021
Main Researcher

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

Real-time Implementation and Validation of Test Software Systems — Dec. 2018 - Dec. 2020
Main Researcher

· For low-latency transmission of compressed data, real-time decoding, parsing, Bit Error Rate statistics, and comparisons, serving the satellite test phase.

Development of Data Decompression Test Equipment — Oct. 2018 - Mar. 2021
Main Researcher

· For low-latency transmission of compressed data, real-time decoding, parsing, Bit Error Rate statistics, and comparisons, serving the satellite test phase.

Real-Time Deployment of Target Detection for Embedded Devices — Jul. 2018 - Dec. 2021
Main Researcher

· Template matching-based target detection algorithm deployed in real-time on a Digital Signal Processing (DSP) embedded platform.

PUBLICATION LIST

- **I2C: Invertible Continuous Codec for High-Fidelity Variable-Rate Image Compression**
  - **Shilv Cai**, Liqun Chen, Zhijun Zhang, Xiangyun Zhao, Jiahuan Zhou, Yuxin Peng, Luxin Yan, Sheng Zhong, and Xu Zou.
  - IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2024.
- **Make Lossy Compression Meaningful for Low-Light Images**
  - **Shilv Cai**, Liqun Chen, Sheng Zhong, Luxin Yan, Jiahuan Zhou, and Xu Zou.
  - The 38th AAAI Conference on Artificial Intelligence (AAAI), Poster, 2024.
- **Powerful Lossy Compression for Noisy Images**
  - **Shilv Cai**, Xiaoguo Liang, Shuning Cao, Luxin Yan, Sheng Zhong, Liqun Chen, and Xu Zou.
  - The IEEE International Conference on Multimedia and Expo (ICME), Oral, 2024.
- **High-Fidelity Variable-Rate Image Compression via Invertible Activation Transformation**
  - **Shilv Cai**, Zhijun Zhang, Liqun Chen, Luxin Yan, Sheng Zhong, and Xu Zou.
  - The 30th ACM International Conference on Multimedia (ACM MM), Poster, 2022.
- **Perceptual-Distortion Balanced Image Super-Resolution is a Multi-Objective Optimization Problem**
  - Qiwen Zhu, Yanjie Wang, **Shilv Cai**, Liqun Chen, Jiahuan Zhou, Luxin Yan, Sheng Zhong, and Xu Zou
  - The 32th ACM International Conference on Multimedia (ACM MM), Oral, 2024.

SELECTED HONORS

- Huazhong University of Science and Technology Academic Scholarship 2022
- Huazhong University of Science and Technology Academic Scholarship 2018
- China National Inspiration Scholarship 2016
- Outstanding Student of Hunan University 2016

ACADEMIC SERVICES

- The Thirteenth International Conference on Learning Representations (ICLR) reviewer 2025
- The Thirty-Ninth Conference on Artificial Intelligence (AAAI) reviewer 2025
- The IEEE Transactions on Neural Networks and Learning Systems (TNNLS) reviewer 2024-Present
- The Advances in Neural Information Processing Systems (NeurIPS) reviewer 2024-Present
- The IEEE Conference on Computer Vision and Pattern Recognition (CVPR) reviewer 2024-Present
- The IEEE International Conference on Multimedia & Expo (ICME) reviewer 2024-Present
- The ACM International Conference on Multimedia (ACM MM) reviewer 2023-Present