

SHILV CAI

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EDUCATION

Nanyang Technological University , Singapore Research fellow in College of Computing and Data Science	Nov. 2024 - Present
Huazhong University of Science and Technology , Wuhan, China Ph.D. in School of Artificial Intelligence and Automation	Sep. 2018 - Sep. 2024
Hunan University , Changsha, China B.Sc. in School of Electrical and Information Engineering	Sep. 2014 - Jun. 2018

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

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| • 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

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|---|--------------|
| • The Forty-second International Conference on Machine Learning (ICML) reviewer | 2025 |
| • 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 |