Zhuoyuan Li

Ph.D. Candidate

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Degree	University	Year	Major	Supervisor
Ph.D.	University of Science and Technology of China	2020-2025	EEIS	Prof. Feng Wu
B.Eng.	Southwest Jiaotong University	2016-2020	ECE	Prof. Liu Yang

Research Areas

- **Image/Video Coding:** Traditional/Learned Coding Tools, Learned End-to-End Compression, Standardization
- **Image/Video Processing:** Image/Video Restoration, Computational Imaging

Brief Bio

I am Zhuoyuan Li. I received the B.E. degree from Southwest Jiaotong University, Sichuan, China, in 2020. I am currently pursuing the Ph.D. degree in University of Science and Technology of China (USTC), Hefei, China, supervised by **Prof. Feng Wu** (IEEE Fellow) and co-supervised by **Prof. Dong Liu**, and expected to receive my Ph.D. degree in 2025.11. I also worked closely with **Prof. Li Li** and many good workers from USTC-iVC & VIDAR lab.

During my Ph.D., my research has focused on image/video coding, with an emphasis on both advanced coding standards (e.g., H.266/VVC, ECM) and emerging learning-based coding frameworks (e.g., DVC, DCVC). My work spans inter prediction, in-loop filtering, and low-complexity optimization, aiming to improve coding efficiency while maintaining practical deployability. Meanwhile, I lead the traditional coding study group of our lab, where I coordinated and guided a series of projects on standardized and neural network-based coding tools. In addition, I have also conducted research in computational imaging, including compression-aware restoration, light field imaging, and event-based vision, further broadening the scope of my expertise from efficient coding to advanced visual sensing and reconstruction.

Looking ahead to my postdoctoral research, I plan to focus on large-model-based/assisted data restoration and compression, and their practical deployment, thereby enabling efficient, scalable, and intelligent visual communication systems.

Publications

- **Z. Li**, Z. Yuan, L. Li, D. Liu*, X. Tang, F. Wu. Object Segmentation-Assisted Inter Prediction for Versatile Video Coding, IEEE Transactions on Broadcasting (T-BC), 2024.
- **Z. Li**, J. Liao, C. Tang, H. Zhang, Y. Li, Y. Bian, X. Sheng, X. Feng, Y. Li, C. Gao, L. Li, D. Liu*, F. Wu*. USTC-TD: A Test Dataset and Benchmark for Image/Video Coding in 2020s, IEEE Transactions on Multimedia (T-MM), 2025.
- **Z. Li**, J. Li, Y. Li, J. Li, L. Li, D. Liu*, F. Wu. In-Loop Filtering using Learned Look-Up Tables for Video Coding, IEEE Transactions on Image Processing (T-IP), TIP-36240-2025, under review, 2025.
- **Z. Li**, Y. Li, C. Tang, L. Li, D. Liu, F. Wu*. Uniformly Accelerated Motion Model for Inter Prediction, IEEE International Conference on Visual Communications and Image Processing (VCIP), 2024.
- **Z. Li**, J. Li, Y. Li, L. Li, D. Liu*, F. Wu. In-Loop Filtering via Trained Look-Up Tables, IEEE International Conference on Visual Communications and Image Processing (VCIP), 2024.
- Y. Li, **Z. Li**, D. Liu, L. Li*. Frequency Domain Intra Pattern Copy for JPEG XS Screen Content Coding, IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT), 2025.
- X. Feng, **Z. Li**, L. Li, D. Liu*, F. Wu. Partition Map-Based Fast Block Partitioning for VVC Inter Coding, IEEE Transactions on Multimedia (T-MM), 2025.
- Y. Li, **Z. Li**, D. Liu, L. Li*. Stochastic-Optimized Low-Latency Rate Control for Image Mezzanine Compression, IEEE Transactions on Image Processing (T-IP), TIP-36036-2025, under review, 2025.
- Z. Xiao, **Z. Li**, Y. Zhao, Y. Liu, Z. Zhang, W. Jia*. Learning Dual Modality Interactions for Event-based Motion Deblurring, IEEE Transactions on Multimedia (T-MM), 2025.
- C. Tang, **Z. Li**, Y. Bian, L. Li, D. Liu*. Neural Video Compression with Context Modulation, Proceedings of Computer Vision and Pattern Recognition (CVPR), 2025.
- C. Tang, **Z. Li**, L. Li, D. Liu*. Neural Video Compression with Reference Hierarchy, Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), under review, 2025.
- C. Gao, **Z. Li**, L. Li, D. Liu*, F. Wu. Rethinking Joint Optimization in Video Coding for Machines: A Case Study, Data Compression Conference (DCC), 2024.
- C. Gao, **Z. Li**, L. Li, D. Liu, F. Wu, W. Lin*. Rethinking Joint Optimization in Feature Compression: Insights from Person Re-Id, IEEE International Conference on Multimedia & Expo (ICME), 2025.

- Y. Li, **Z. Li**, L. Li*, D. Liu, H. Li. Global Homography Motion Compensation for Versatile Video Coding, IEEE International Conference on Visual Communications and Image Processing (VCIP), 2022.
- J. Li, **Z. Li**, Y. Li, L. Li*, D. Liu, H. Li*. Collaborative Decoder-side Motion Vector Refinement for Video Coding, IEEE International Symposium on Circuits and Systems (ISCAS), 2025.
- Z. Xiao, **Z. Li**, W. Jia*. Occlusion-Embedded Hybrid Transformer for Light Field Super-Resolution, Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), 2025.
- Z. Xiao, **Z. Li**, Z. Zhang, W. Jia*. Blur-Variant Flow for Blurry Video Frame Interpolation with Local-Global Interactions, IEEE Transactions on Multimedia (T-MM), MM-025533, under review, 2025.
- C. Dong, H. Ma, **Z. Li**, L. Li, D. Liu*. Temporal Wavelet Transform-based Low-Complexity Perceptual Quality Enhancement of Compressed Video, IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT), 2024.
- J. Liao, Y. Li, **Z. Li**, L. Li*, D. Liu. IVCA: Inter-Relation-Aware Video Complexity Analysis, IEEE International Symposium on Circuits and Systems (ISCAS), 2025.
- C. Tang, X. Sheng, **Z. Li**, H. Zhang, L. Li, D. Liu*. Offline and Online Optical Flow Enhancement for Deep Video Compression, Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), 2024.
- X. Liang, C. Tang, **Z. Li**, L. Li, D. Liu*. Perceptual Neural Video Compression with Color Separation and Rank Chain, Proceedings of the AAAI Conference on Artificial Intelligence (AAAI), under review, 2025.

Standardization Activity

- **Z. Li**, J. Liao, C. Tang, H. Zhang, et al. An Evaluation Dataset USTC-TD Used for AVS-EEM Training, AVS, 2025.
- Y. Li, **Z. Li**, L. Li, D. Liu. Proposal for Intra Pattern Copy of JPEG XS Screen Content Image Coding, JPEG XS, 2024.
- Y. Li, **Z. Li**, L. Li, D. Liu. New Use Cases and Requirements, JPEG XS, 2024.
- Y. Li, **Z. Li**, L. Li, D. Liu. Intra-Picture Decorrelation Tools for JPEG XS Screen Content Coding, JPEG XS, 2024.
- C. Tang, Y. Bian, X. Sheng, **Z. Li**, L. Li, D. Liu. A Validation Dataset USTC-TD Used for AVS-EEM Stable Training, AVS, 2024.
- Y. Li, H. Zhang, Y. Li, **Z. Li**, et al. An Improvement for AVS-EEM I-slice Model, AVS, 2025.

Patent

- D. Liu, **Z. Li**, S. Huo, L. Li, F. Wu, J. Mao, Y. Zhao. Inter Prediction Method and Electronic Device, Chinese Patent.
- D. Liu, **Z. Li**, Y. Li, L. Li, F. Wu, J. Mao, Y. Zhao. Inter Prediction Method and Electronic Device, Chinese Patent.
- D. Liu, **Z. Li**, J. Li, L. Li, F. Wu, J. Mao, Y. Zhao. Image Coding Method and Electronic Device, Chinese Patent.
- D. Liu, C. Tang, **Z. Li**, L. Li. An End-to-End Video Coding Method, Chinese Patent.
- L. Li, J. Li, Y. Li, **Z. Li**, D. Liu, J. Mao, Y. Zhao. Inter Prediction Method and Electronic Device, Chinese Patent.

Academic Competition

- Grand Challenge on "Video Complexity" (Track 1) in IEEE ICIP 2024 — 1st Place
- Grand Challenge on "End-to-End Practical Image Compression" (Performance Track) in IEEE MMSP 2024 — 1st Place
- Grand Challenge on "End-to-End Practical Image Compression" (Complexity Track) in IEEE MMSP 2024 — 1st Place
- Grand Challenge on "End-to-End Practical Video Compression" (Performance Track) in IEEE MMSP 2024 — 1st Place
- Grand Challenge on "Video Complexity" (Track 2) in IEEE ICIP 2024 — 2nd Place
- Grand Challenge on "End-to-End Practical Video Compression" in IEEE VCIP 2023 — 2nd Place
- NTIRE 2025 Challenge on Image Super-Resolution ($\times 4$) in CVPRW 2025 — 5th Place
- NTIRE 2025 Challenge on Efficient Burst HDR and Restoration in CVPRW 2025 — 6th Place
- NTIRE 2025 Challenge on Single Image Reflection Removal in the Wild in CVPRW 2025 — 11th Place

Academic Services

- Leading Workshop Chair of ACM MM Asia 2025
- Journal Reviewer: T-IP, T-MM, T-CSVT, T-BC, IOT, OJSP, IJIG, AI-R
- Conference Reviewer: ACM MM 2022-2025, NeurIPS 2024-2025, ICML 2025, ICLR 2025-2026, AAAI 2026, IJCAI 2025, ECAI 2025, ICME 2025, ICPR 2024, IJCNN 2025, MMSP 2024-2025, VCIP 2023-2025, WCSP 2024, DCC 2025, ICASSP 2025

Project

- Research on Key Technologies for the Next-Generation International Video Coding Standards, 2022–2025, Huawei Inc.
  Worked on advanced Inter Prediction, filtering, and neural-network-based coding tools to contribute to future international standards.
- Audio and Video Codec Optimization, 2022–2023, iFlytek Co., Ltd.
  Worked on high-quality reconstruction and low-latency optimization for video communication applications.
- Extreme Reconstruction and Super-Resolution, 2022–2023, Institute of Deep Space Exploration.
  Worked on real-time video super-resolution and reconstruction of deep space returned videos.