Chuanmin Jia, Ph.D.

INFORMATION

Assistant Professor
Wangxuan Institute of Computer Technology
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RESEARCH INTERESTS

- Multimedia Computing
- Image, Video and Multimedia Signal Processing
- Video Communications
- Deep Learning Feature & Model Compression

EDUCATION

Ph.D. in Computer Application Technology, Sep. 2015 – Jul. 2020
- Peking University, Advisor: Prof. Siwei Ma
- School of Electronics Engineering and Computer Science

B.Eng in Computer Science and Technology, Sep. 2011 – Jul. 2015
- Beijing University of Posts and Telecommunications
- School of Computer Science, GPA: 86.7/100

EXPERIENCE

Assistant Professor, Oct. 2022 – Now
- Peking University
- Wangxuan Institute for Computer Technology

Boya Postdoctoral Research Fellow, Jul. 2020 – Sep. 2022
- Peking University, Advisor: Prof. Wen Gao, IEEE/ACM Fellow
- National Research Center for Visual Technology

Research Intern, Mar. 2019 – Dec. 2019
- Peng Cheng National Laboratory
- Artificial Intelligence Research Center

Visiting scholar, Dec. 2017 – Dec. 2018
- New York University, Advisor: Prof. Yao Wang, IEEE Fellow
- Video Lab, Department of Electric and Computer Engineering

PROFESSIONAL ACTIVITY

Reviewer Service
- IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT).
- IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI).
- IEEE Transactions on Image Processing (T-IP).
- IEEE Transactions on Multimedia (T-MM).
- IEEE Signal Processing Letter (SPL).
- IEEE Multimedia (MM)
- IEEE International Conference on Image Processing (ICIP).
- IEEE International Conference on Multimedia and Expo (ICME).
- IEEE International Symposium on Multimedia (ISM).
- IEEE International Symposium on Circuits and Systems (ISCAS).

- IEEE Picture Coding Symposium (PCS).
- IEEE Visual Communication and Image Processing (VCIP).
- Journal of Visual Communication and Image Representation (JVCIR).
- IET Image Processing.
- Signal Processing.
- Computer Communications
- Information Science.
- Neural Network (NEUNET).
- Expert Systems With Applications (ESWA).

Organizing Committee

- Program Member of 2020 IEEE International Conference on Image Processing (ICIP).
- Program Member of 2021 IEEE International Conference on Multimedia and Expo (ICME).
- Challenge Organizer of practical learned image compression in conjunction with 2022 IEEE Visual Communications and Image Processing.

Standard Service

- MPAI End-to-end video (EEV) Coding Standard Chair
- IEEE 1857.11 Standard Software Coordinator Lead

TEACHING EXPERIENCE

TA: Video Coding and Understanding (EECS 04812102), EECS, PKU, Spring.2017
TA (for projects): Image and Video Processing (EL-GY 6123), ECE, NYU, Spring.2018

PROGRAM SKILLS

Languages & Software: C/C++, CUDA, MATLAB, Power Shell, Python, LaTeX.
Libraries/Frameworks: Caffe, PyTorch, Tensorflow, HEVC, AVS2, VVC, AVS3.

HONORS & AWARDS

Excellent Doctoral Dissertation Award by BSIG, 2022
Young Elite Scientist Sponsorship Program by BAST, 2022
National Postdoctoral Program for Innovation Talents, 2021
National Scholarship, 2020
President Scholarship, 2019
Qualcomm Scholarship, 2019
Best Student Paper Award of IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR), 2019
Best Paper Award of IEEE Multimedia Magazine, 2018
Innovation Scholarship, PKU, 2018
Outstanding Reviewer of JVCIR, 2017
Best Reviewer of IEEE Visual Communication and Image Processing (VCIP), 2017
Best Paper Award of Pacific-Rim Conference on Multimedia (PCM), 2017
Outstanding Reviewer of JVCIR, 2016
1^{st} prize of Video Big Data Compression Contest of National Graduate Contest on Smart-City Technology. 2016
Excellent Graduation Thesis Award, 2015
Excellent Undergraduates, 2015
Innovation Scholarship, 2015
Honorable Mention Winner in Mathematical Contest in Modeling (MCM), 2014

JOURNAL PAPERS

[J18] Z. Huang, **C. Jia**, S. Wang and S. Ma, "HMFVC: A Human-Machine Friendly Video Compression Scheme," *accepted by* IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 2022.

[J17] J. Zhang, M. Wang, **C. Jia**, S. Wang, S. Ma and W. Gao, "Scalable Intra Coding Optimization for Video Coding," IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 32(10): 7092-7106, 2022.

[J16] S. Wang, **C. Jia**, X. Zhang, S. Wang, S. Ma and W. Gao, "A Pixel-level Segmentation-Synthesis Framework for Dynamic Texture Video Compression, IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)," 32(10): 7077-7091, 2022.

[J15] **C. Jia**, X. Hang, S. Wang, Y. Wu, S. Ma and W. Gao, "FPX-NIC: An FPGA-Accelerated 4K Ultra-high-definition Neural Video Coding System," IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 32(9): 6385-6399, 2022.

[J14] S. Ma, X. Zhang, **C. Jia**, Z. Zhao, S. Wang and S. Wang, "Image and Video Compression with Neural Networks: A Review," IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 30(6): 1683-1698, 2020.

[J13] S. Ma, S. Wang, X. Zhang, X. Zhang, **C. Jia** and S. Wang "Joint Feature and Texture Coding: Towards Smart Video Representation via Front-end Intelligence," *IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)*, 29(10): 3095-3105, 2019.

[J12] X. Meng, **C. Jia**, X. Zhang, S. Wang and S. Ma, "Deformable Wiener Filter for Future Video Coding," *accepted by* IEEE Transactions on Image Processing (TIP), 2022.

[J11] W. Duan, Z. Liu, **C. Jia**, S. Wang, S. Ma and W. Gao, "Differential Weight Quantization For Multi-Model Compression," *accepted by* IEEE Transactions on Multimedia (TMM), 2022.

[J10] J. Zhang, Y. Jian, S. Wang, **C. Jia**, S. Wang, S. Ma and W. Gao, "Textural and Directional Information Based Offset In-Loop Filtering in AVS3," *accepted by* IEEE Transactions on Multimedia (TMM), 2022.

[J9] S. Ma, L. Zhang, S. Wang, **C. Jia**, S. Wang, T. Huang, F. Wu and W. Gao, "Evolution of AVS Video Coding Standards: Twenty Years of Innovation and Development," SCIENCE CHINA Information Sciences (Sci. China Inf. Sci.), 65(9): 1-24, 2022.

[J8] J. Chang, Z. Zhao, **C. Jia**, S. Wang, L. Yang, Q. Mao, J. Zhang and S. Ma, "Conceptual Compression via Deep Structure and Texture Synthesis," IEEE Transactions on Image Processing (TIP), 39: 2809-2823, 2022.

[J6] X. Meng, **C. Jia**, X. Zhang, S. Wang and S. Ma, "Spatio-temporal Correlation Guided Geometric Partitioning for Versatile Video Coding," IEEE Transactions on Image Processing (TIP), 31: 30-42, 2022.

[J7] K. Lin, **C. Jia**, X. Zhang, S. Wang, S. Ma and W. Gao, "NR-CNN: Nested-Residual Guided CNN In-loop Filtering for Video Coding," ACM Transactions on Multimedia Computing Communications and Applications (TOMM), 18(4): 1-22, 2022.

[J5] **C. Jia**, F. Luo, X. Zhang, S. Wang, S. Wang and S. Ma, "Fast Non-local Adaptive In-Loop Filter Optimization on GPU," IEEE Transactions on Multimedia (TMM), 23: 39-51, 2021.

[J4] J. Li, X. Zhang, **C. Jia**, J. Xu, L. Zhang, Y. Wang, S. Ma and W. Gao, "Direct Speech-to-image Translation," *IEEE Journal of Selected Topics in Signal Processing (JSTSP)*, 14(3), 517-529, 2020.

[J3] **C. Jia**, S. Wang, X. Zhang, S. Wang, J. Liu, S. Pu and S. Ma, "Content-Aware Convolutional Neural Network for In-loop Filtering in High Efficiency Video Coding," *IEEE Transactions on Image Processing (TIP)*, 28(7): 3343-3356, 2019.

[J2] **C. Jia**, X. Zhang, S. Wang, S. Wang and S. Ma, "Light Field Image Compression Using Generative Adversarial Network Based View Synthesis," *IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS)*, 9(1): 177-189, 2019.

[J1] S. Ma, X. Zhang, J. Zhang, **C. Jia**, S. Wang and W. Gao "Nonlocal In-Loop Filter: The Way Toward Next-Generation Video Coding?," *IEEE Multimedia (MM)* 23(2): 16-26, 2016. (**Best Paper Award**)

CONFERENCE PAPERS

[C30] **C. Jia**, X. Hang, W. Liu, S. Wang and S. Ma, "FPX-NVC: An FPGA-Accelerated P-frame Based Neural Video Coding System," accepted by IEEE Visual Communication and Image Processing (VCIP), Suzhou, China, 2022.

[C29] W Duan, K Lin, **C. Jia**, X Zhang, S Ma and W Gao, "End-to-End Image Compression via Attention-Guided Information-Preserving Module," *Proc. of IEEE International Conference on Multimedia & Expo (ICME)*, China, July, 2022.

[C28] R Wang, Q Mao, S Wang, **C. Jia**, R Wang and S Ma, "Disentangled Visual Representations for Extreme Human Body Video Compression," *Proc. of IEEE International Conference on Multimedia & Expo (ICME)*, China, July, 2022.

[C27] **C. Jia**, Z. Ge, S. Wang, S. Ma and W. Gao, "Rate Distortion Characteristic Modeling for Neural Image Compression," *Proc. of IEEE Data Compression Conference (DCC)*, Snowbird, USA, Mar., 2022.

[C26] K. Lin, J. Zhang, J. Li, **C. Jia** and W. Gao, "High-Order Intra Prediction for Future Video Coding," *Proc. of IEEE Data Compression Conference (DCC)*, Snowbird, USA, Mar., 2022.

[C25] J. Zhang, M. Wang, **C. Jia**, Q. Wang, S. Wang, S. Ma and W. Gao, "Fast Partition Mode Decision via a Plug-in Fully Connected Network for Video Coding," *Proc. of IEEE Data Compression Conference (DCC)*, Snowbird, USA, Mar., 2022.

[C24] J. Li, **C. Jia**, X. Zhang, S. Ma and W. Gao, "Cross Modal Compression: Towards Human-comprehensible Semantic Compression," *Proc. of 29th ACM International Conference on Multimedia (MM)*, Chengdu, Oct., 2021.

[C23] Z. Huang, **C. Jia**, S. Wang and S. Ma, "Visual Analysis Motivated Rate-Distortion Model for Image Coding," *Proc. of IEEE International Conference on Multimedia & Expo (ICME)*, online, July, 2021.

[C22] J. Chang, Z. Zhao, L. Yang, **C. Jia**, J. Zhang and S. Ma, "Thousand to One: Semantic Prior Modeling for Conceptual Coding," *Proc. of IEEE International Conference on Multimedia & Expo (ICME)*, online, July, 2021.

[C21] Z. Huang, K. Lin, **C. Jia**, S. Wang and S. Ma, "Beyond VVC: Towards Perceptual Quality Optimized Video Compression Using Multi-Scale Hybrid Approaches," *Proc. of the IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, Online, 2021.

[C20] Z. Zhao, **C. Jia**, S. Wang, S. Ma and J. Yang. "Learned Image Compression Using Adaptive Block-Wise Encoding and Reconstruction Network," *Proc. of International Symposium on Circuits and Systems (ISCAS)*, Daegu, Korea, 2021.

[C19] X. Meng, J. Zhang, **C. Jia**, X. Zhang, S. Wang and S. Ma, "Optimized Adaptive Loop Filter in Versatile Video Coding," *Proc. of IEEE Data Compression Conference (DCC)*, Snowbird, USA, 2021

[C18] Y. Jian, J, Zhang, **C. Jia**, S. Wang, S. Wang and S. Ma, "Quad-tree Based Sample Refinement Filter for Video Coding," *Proc. of IEEE Data Compression Conference (DCC)*, Snowbird, USA, 2021.

[C17] J. Zhang, X. Meng, **C. Jia**, Y. Su, S. Xu, S. Wang, S. Ma and W. Gao, "Inheritability-inspired Intra Coding Optimization for AVS3," *Proc. of IEEE International Conference on Multimedia and Expo Workshop (ICMEW)*, London, U. K., July, 2020.

[C16] X. Meng, X. Zhang, **C. Jia**, X. Li, S. Wang and S. Ma, "Edge-directed Geometric Partitioning for Versatile Video Coding," *Proc. of IEEE International Conference on Multimedia and Expo (ICME)*, London, U. K., July, 2020.

[C15] J. Li, X. Zhang, **C. Jia**, J. Xu, L. Zhang, Y. Wang, S. Ma and W. Gao, "Universal Adversarial Perturbations Generative Network for Speaker Recognition," *Proc. of IEEE International Conference on Multimedia and Expo (ICME)*, London, U. K., July, 2020.

[C14] H. Ren, **C. Jia**, F. Luo, J. Li, S. Wang, S. Ma and W. Gao, "SVT-AVS3: Scalable Video Technology of AVS3,," *Proc. of IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR)*, Shenzhen, China, July, 2020.

[C13] K. Lin, **C. Jia**, Z. Zhao, L. Wang, S. Wang, S. Ma and W. Gao, "Residual in Residual Based Convolutional Neural Network In-loop Filter for AVS3," *Proc. of IEEE Picture Coding Symposium (PCS)*, Ningbo, China, Nov, 2019.

[C12] J. Zhang, **C. Jia**, M. Lei, S. Wang, S. Ma and W. Gao, "Recent Development of AVS Video Coding Standard: AVS3," *Proc. of IEEE Picture Coding Symposium (PCS)*, Ningbo, China, Nov, 2019.

[C11] **C. Jia**, Z. Liu, Y. Wang, S. Ma and W. Gao, "Layered Image Compression using Scalable Auto-encoder," *Proc. of IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR)*, San Jose, California, USA, Mar, 2019. (Oral, 19%) (**Best Student Paper Award**)

[C10] Y. Li, **C. Jia**, S. Wang, X. Zhang, S. Wang, S. Ma and W. Gao, "Joint rate-distortion optimization for simultaneous texture and deep feature compression of facial images," *Proc. of IEEE International Conference on Multimedia Big Data (BigMM)*, Xi'an, China, Sep, 2018.

[C9] Z. Zhao, S. Wang, **C. Jia**, X. Zhang, S. Ma and J. Yang, "Light Field Image Compression Based on Deep Learning," *Proc. of IEEE International Conference on Multimedia & Expo (ICME)*, San Diego, California, USA, July, 2018.

[C8] Y. Wang, X. Fan, **C. Jia**, D. Zhao and W. Gao, "Neural Network Based Inter Prediction for HEVC," *Proc. of IEEE International Conference on Multimedia & Expo (ICME)*, San Diego, California, USA, July, 2018.

[C7] X. Meng, **C. Jia**, S. Wang, X. Zheng and S. Ma, "Optimized Non-local In-Loop Filter for Video Coding," *Proc. of IEEE Picture Coding Symposium (PCS)*, San Francisco, California, USA, June, 2018.

[C6] **C. Jia**, S. Wang, X. Zhang, S. Wang and S. Ma, "Spatial-Temporal Residue Network Based In-Loop Filter for Video Coding," *Proc. of IEEE Visual Communications and Image Processing (VCIP)*, St.Petersburg, Florida, USA, Dec, 2017.

[C5] **C. Jia**, Y. Yang, X. Zhang, S. Wang, S. Wang and S. Ma, "Light Field Image Compression with Sub-apertures Reordering and Adaptive Reconstruction," *Proc. of the Pacific-Rim Conference on Multimedia (PCM)*, Harbin, China, Sept, 2017. (**Best Paper Award**)

[C4] **C. Jia**, Y. Yang, X. Zhang, S. Wang, X. Zhang, S. Wang and S. Ma, "Optimized Inter-view Prediction Based Light Field Image Compression with Adaptive Reconstruction," *Proc. of IEEE International Conference on Image Processing (ICIP)*, Beijing, China, Sep., 2017.

[C3] **C. Jia**, X. Zhang, J. Zhang, S. Wang and S. Ma, "Deep Convolutional Network based Image Quality Enhancement for Low Bit Rate Image Compression," *Proc. of IEEE Visual Communications and Image Processing (VCIP)*, Chengdu, China, Nov. 2016.

[C2] J. Zhang, **C. Jia**, N. Zhang, S. Ma, and W. Gao, "Structure-driven Adaptive Non-local Filter for High Efficiency Video Coding (HEVC)," *Proc. of IEEE Data Compression Conference (DCC)*, Snowbird, Utah, USA, Mar. 2016.(**Top Conference in Data Compression**)

[C1] J. Zhang, **C. Jia**, S. Ma, and W. Gao, "Non-Local Structure-Based Filter for Video Coding," *Proc. of IEEE International Symposium on Multimedia (ISM)*, Miami, Florida, USA, Dec. 2015.

STANDARD CONTRIBUTIONS

[S10] K. Lin, **C. Jia**, S Wang, 'Crosscheck of JVET-AA0113 (EE1-1.6-related: RDO Considering Deep In-Loop Filter with SADL)," JVET-AA0218, online, July, 2022.

[S9] K. Lin, **C. Jia**, S Wang, "Crosscheck of JVET-AA0115 (EE1-1.6-related: ALF with Samples before Deep In-Loop Filter)," JVET-AA0219, online, July, 2022.

[S8] K. Lin, **C. Jia**, S Wang, "Cross-check of JVET-AA0111 (EE1-1.6: Deep In-Loop Filter With Fixed Point Implementation)," JVET-AA0181, online, July, 2022.

[S7] K. Lin, J. Zhang, Y. Zhao, **C. Jia**, S. Wang, S Ma, "CNN in-loop filters for B-pictures in AVS3," AVS-M5973, Online, 2020.12.

[S6] K. Lin, J. Zhang, Y. Zhao, **C. Jia**, S. Wang, S Ma, "Bugfix: syntax elements correction in parsing CNN in-loop filters," AVS-M5971, Online, 2020.12.

[S5] J. Zhang, **C. Jia**, S. Wang, S. Ma, "Enhanced TSCPM Mode," AVS-M4958, Chengdu, China, 2019.8.

[S4] B. Ray, G. Van der Auwera, M. Karczewicz, J. Zhang, X. Zheng, **C. Jia**, S. Wang, S. Ma, S. Keating, K. Sharman, "Non-CE3: Revised intra chroma mode coding simplification", JVET-O1153, Gothenburg, SE, July, 2019.

[S3] X. Meng, **C. Jia**, Z. Wang, S. Wang, S. Ma, X. Zheng, "CE2: Non-local Structure-based In-loop Filter," Joint Video Exploration Team (JVET) of ITU-T SG, JVET-K0160, Ljubljana, Slovenia, July, 2018.

[S2] Z. Wang, X. Meng, **C. Jia**, J. Cui, S. H. Wang, S. Wang, S. Ma, W. Li, Z. Miao and X. Zheng, "Description of SDR video coding technology proposal by DJI and Peking University," Joint Video Exploration Team (JVET) of ITU-T SG, JVET-J0011, San Diego, USA, April, 2018.

[S1] X. Meng, **C. Jia**, Z. Wang, S. Wang, S. Ma, X. Zheng, "Non-local Structure-based Filter with integer operation," Joint Video Exploration Team (JVET) of ITU-T SG, JVET-J0071, San Diego, USA, April, 2018.