Chuanmin Jia

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RESEARCH INTERESTS

- Video Compression/Processing
- Light Field Image Coding
- Deep Feature Compression
- Machine Learning

EDUCATION

Peking University (PKU), BJ, CHN, 2015 – 2020
- *Ph.D. student,* Computer Science
- Advisor: Prof. Siwei Ma and Prof. Wen Gao

New York University (NYU), NY, USA, 2017 – 2018
- *Visiting Ph.D student,* Electrical and Computer Engineering
- Advisor: Prof. Yao Wang

Beijing Univ. of Posts. & Telecom. (BUPT), BJ, CHN, 2011 – 2015
- *B.Eng,* Computer Science
- GPA: 86.7/100
- Thesis: Research on Compressed Video Enhancement and GPU Acceleration.

EXPERIENCE

Boya Postdoctoral Researcher, PKU-EECS July. 2020 – Current
Institute of Digital Media, Beijing
- Deep neural network based image and video coding.
- Generic data representation learning.

Research Assistant, PKU-EECS Sep. 2014 – July. 2020
Institute of Digital Media, Beijing
- Designed CNN based in-loop filter as coding tools for future video coding standards.
- Implemented video restoration and quality enhancement algorithm based on non-local self similarity prior.
- Optimized non-local self similarity based in-loop filter algorithm for next generation video coding standards.
- Proposed high efficiency light field image compression algorithm based on sub-aperture adaptation.

Research Intern, Peng Cheng Laboratory Mar. 2019 – Sep. 2019
Artificial Intelligence Department, Shenzhen
- Developed the 8K real-time video codec based on AVS3 standards.
- Investigated Deep Learning-inspired video coding tools for AVS3 standards.

Visiting scholar, NYU-Tandon Dec. 2017 – Dec. 2018
Video Lab, Brooklyn, NY
- Layered end-to-end image compression via scalable auto-encoder.
- Pareto optimization for end-to-end image compression and image analytic tasks.

PUBLICATIONS *Journal Papers*

- 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.
- **C. Jia**, F. Luo, X. Zhang, S. Wang, S. Wang and S. Ma, "Fast Non-local Adaptive In-Loop Filter Optimization on GPU," **accepted** by IEEE Transactions on Multimedia (TMM), 2020.
- **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.
- **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.
- S. Ma, X. Zhang, **C. Jia**, Z. Zhao, S. Wang and S. Wang, "Image and Video Compression with Neural Networks: A Review," **accepted** by IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 30(6): 1683-1698, 2020.
- 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.
- 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* 23(2): 16-26, 2016. (**Best Paper Award**)

Conference Papers

- J. Zhang, X. Meng, **C. Jia**,Y. Su, S. Xu, S. Wang, S. Ma and W. Gao, "Edge-directed Geometric Partitioning for Versatile Video Coding," **accepted** by *IEEE International Conference on Multimedia and Expo Workshop (***ICMEW***)*, London, U. K., July, 2020.
- X. Meng, X. Zhang, **C. Jia**, X. Li, S. Wang and S. Ma, "Edge-directed Geometric Partitioning for Versatile Video Coding," **accepted** by *IEEE International Conference on Multimedia and Expo (***ICME***)*, London, U. K., July, 2020.
- 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," **accepted** by *IEEE International Conference on Multimedia and Expo (***ICME***)*, London, U. K., July, 2020.
- H. Ren, **C. Jia**, F. Luo, J. Li, S. Wang, S. Ma and W. Gao, "SVT-AVS3: Scalable Video Technology of AVS3,," **accepted** by *IEEE International Conference on Multimedia Information Processing and Retrieval (***MIPR***)*, Shenzhen, China, July, 2020.
- 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.
- 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.

- **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**)
- 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. (Poster)
- 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. (Oral, 15%)
- 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. (Poster, 30%)
- 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. (Poster)
- **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. (Oral)
- **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. (Oral) (**Best Paper Award**)
- **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**), grand challenge for LF image coding, Beijing, China, Sept, 2017. (Oral)
- **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. (Oral)
- 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. (Oral) (**Top Conference in Data Compression**)
- 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. (Oral)

Standardization Contributions

- 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.
- 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.

- 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.

PROFESSIONAL ACTIVITY

Reviewer Service

- IEEE Transactions on Image Processing (T-IP).
- IEEE Transactions on Multimedia (T-MM).
- IEEE ACCESS.
- IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT).
- Journal of Visual Communication and Image Representation (JVCIR).
- IEEE International Conference on Image Processing (ICIP).
- IEEE International Conference on Multimedia and Expo (ICME).
- IEEE International Symposium on Multimedia (ISM).
- IEEE Visual Communication and Image Processing (VCIP).
- IEEE Member

Conference Presentations and Invited Talks

- Description of SDR video coding technology proposal by DJI and Peking University, *San Diego, CA, U.S, April. 2018*
- Non-local Structure-based Filter with integer operation, *San Diego, CA, U.S, April. 2018*
- Spatial-Temporal Residue Network Based In-Loop Filter for Video Coding, *VCIP2017, St Petersburg, FL, U.S, Dec. 2017*
- Light Field Image Compression with Sub-apertures Reordering and Adaptive Reconstruction, *PCM2017, Harbin, China, Sep. 2017*
- Optimized Inter-View Prediction Based Light Field Image Compression With Adaptive Reconstruction, *ICIP2017, Grand Challenge for Light Field Image coding, Beijing, China, Sep. 2017*
- Deep Convolutional Network based Image Quality Enhancement for Low Bit Rate Image Compression, *VCIP2016, Chengdu, China, Nov. 2016*

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

COMPUTER SKILLS

Languages & Software: C/C++, CUDA, MATLAB, Power Shell, Python, LaTeX.
Operating Systems: Mac OS X, Ubuntu Linux, Windows.
Libraries/Frameworks: Caffe, MXNET, Tensorflow, HM, AVS2, VTM, AVS3.
Homepage: `http://www.jiachuanmin.site`
Google Scholar: `https://scholar.google.com/citations?user=x5Na9n0AAAAJ`

HONORS & AWARDS

National Scholarship, PKU, 2020
President Scholarship, PKU, 2019
Qualcomm Scholarship, PKU, 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, BUPT, 2015
Excellent Undergraduates, BUPT, 2015
Innovation Scholarship, PKU, 2015
Honorable Mention Winner in Mathematical Contest in Modeling (MCM), 2014