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 – present
- *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.

RESEARCH EXPERIENCE

Research Assistant, PKU-EECS   Sep. 2014 – present
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.
- Optimized virtual view synthesis algorithm using CUDA, achieved real-time view synthesis for full HD videos.

Research Intern, Peng Cheng Laboratory   Mar. 2019 – present
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.

Research Intern, PKU-EECS   Feb. 2014 – Aug. 2014
Institute of Computational Linguistics, Beijing

- Conducted performance comparison on different deep learning algorithms for Chinese word segmentation and word embedding.

Research Intern, BUPT-SCS   Aug. 2013 – Mar. 2014
Innovation Center, Beijing
- Interned as a national undergraduate projects member for innovation research.

PUBLICATIONS   *Journal Papers*
- <u>**C. Jia**</u>, 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.

- <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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), 2019.

- S. Ma, S. Wang, X. Zhang, X. Zhang, <u>**C. Jia**</u> and S. Wang "Joint Feature and Texture Coding: Towards Smart Video Representation via Front-end Intelligence," **Accepted** by IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), 2018.

- S. Ma, X. Zhang, J. Zhang, <u>**C. Jia**</u>, S. Wang and W. Gao "Nonlocal In-Loop Filter: The Way Toward Next-Generation Video Coding?," *IEEE MultiMedia* 23(2): 16-26, 2019. (**Best Paper Award**)

Conference Papers
- <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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)

- <u>**C. Jia**</u>, 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)

- <u>**C. Jia**</u>, 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**)
- <u>**C. Jia**</u>, 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)
- <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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, <u>**C. Jia**</u>, 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 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 Student 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, JEM, AVS3. *Github Repo:* ⌕ https://github.com/codersadis *Homepage:* ⌕ http://www.jiachuanmin.site *Google Scholar:* ⌕ https://scholar.google.com/citations?user=x5Na9n0AAAAJ

HONORS & AWARDS	**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 1st 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