

JIE DONG, Ph.D.
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Summary

- Seasoned professional in the field of video coding and processing for more than 10 years.
- Solid foundation of video coding (probability and information theory, random process, and digital signal processing).
- Proven track record of innovation and top-tier research in developing advanced video coding and processing technologies (1 book chapter, 8 journal papers, and 17 conference papers).
- Deep knowledge of video coding standards (MPEG-x, H.26x, SVC, MVC, VC-1, HEVC, SHVC, JVET, and AVS) and the reference software (JM, JSVM, KTA, HM, SHM, and JEM).
- Five-plus years of experience in developing video coding standards within the standardization bodies VCEG, MPEG, JCT-VC, and AVS.
- Extensive experience in the process of developing intellectual properties.
- Proficient in C, C++ and MATLAB programming.
- Excellent written and oral communication skills.

Experience

Qualcomm Technologies, Inc., San Diego, CA, USA

QCT Multimedia R&D and Standards *Senior Staff Engineer* 9/2016 –present

- Develop advanced video coding technologies for JVET.

InterDigital Communications, San Diego, CA, USA

Video and Incubation *Staff Engineer* 2/2011 –3/2014

- Developed adaptive video pre- and post-processing algorithms, which provide 3dB PSNR gain at low bit-rates and 1 dB gain at high bit-rates compared with H.264/AVC High Profile.
- Worked with the development team to optimize the pre-/post-processing algorithms for mobile devices.
- Represented InterDigital at the standards committee meetings.
- Proposed techniques on transform design, quantization, weighted prediction, and high level syntax for HEVC.
- Proposed techniques on upsampling, inter-layer filtering, and color gamut conversion for SHVC.

The Chinese University of Hong Kong, Hong Kong SAR

Image and Video Processing Laboratory *Postdoctoral Fellow* 1/2010 - 1/2011

- Developed adaptive pre-interpolation filter (APIF), which has low complexity but outperforms the joint use of adaptive interpolation filter (AIF) and adaptive loop filter (ALF) in the VCEG KTA software.
- Developed directional transform for block-based video coding, which efficiently compacts energies along arbitrary directions and provides PSNR gain up to 0.46 dB compared with H.264/AVC High Profile.

Image and Video Processing Laboratory *Research Assistant* 8/2005 - 12/2009

- Developed two series of 2D order-16 integer transforms, which provide different trade-offs between performance and complexity. Both significantly outperform their equivalents in the state-of-the-art international video coding standards.
- Developed two de-interlacing algorithms for H.264 coded videos, which provide good visual quality and de-interlace 1080i videos in real time on PCs.
- Developed parametric interpolation filter (PIF) for motion-compensated prediction, which significantly outperforms all the five adaptive interpolation filters (AIF) in the VCEG KTA software.
- Represented The Chinese University of Hong Kong at the AVS meetings.

Department of Electronic Engineering *Teaching Assistant* 8/2005 - 7/2008

- Undergraduate courses: “Random Process and Digital Signal Processing”, “Advanced Digital Signal Processing and Applications”, and “Digital Image Processing”.
- Postgraduate course: “Advanced Techniques for Video Coding”.

Zhejiang University, Hangzhou, China

Institute of Information and Communication Engineering *Research Assistant* 9/2002 - 7/2005

- Represented Zhejiang University at the AVS meetings.

- Developed an adaptive scan scheme, which was adopted in AVS Part-2 Enhancement Profile.
- Developed a context-based low-complexity entropy coding scheme, which was adopted in AVS Part-7.

Academic Qualifications

- Aug. 2005 – Dec. 2009 Ph.D. in Electronic Engineering, The Chinese University of Hong Kong
- Sept. 2002 – Mar. 2005 M.Eng. in Information Engineering, Zhejiang University, China
- Sept. 1998 – Jul. 2002 B.Eng. in Information Engineering, Zhejiang University, China

Selected Publications

1. **Jie Dong** and Yan Ye, “Adaptive downsampling for high-definition video coding,” *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 24, No. 3, pp. 480-488, Mar. 2014.
2. **Jie Dong** and King Ngi Ngan, “Two-layer directional transform for high performance video coding,” *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 22, No. 4, pp. 619-625, Apr. 2012.
3. **Jie Dong** and King Ngi Ngan, “Adaptive pre-interpolation filter for high efficiency video coding,” *Journal of Visual Communication and Image Representation, Special Issue on Emerging Techniques for High Performance Video Coding*, Vol. 22, Issue 8, pp. 697-703, Nov. 2011.
4. **Jie Dong** and King Ngi Ngan, “Parametric interpolation filter for HD video coding,” *IEEE Transactions on Circuits and Systems for Video Technology*, Vol.20, No.12, pp.1892-1897, Dec. 2010.
5. **Jie Dong** and King Ngi Ngan, “Real-time de-interlacing for H.264 coded HD videos,” *IEEE Transactions on Circuits and Systems for Video Technology*, Vol.20, No.8, pp.1144-1149, Aug. 2010.
6. **Jie Dong** and King Ngi Ngan, “Present and future video coding standards,” in *Intelligent Multimedia Communication: Techniques and Applications*, Springer-Verlag Publisher, ISBN 978-3-642-11685-8, Jan. 2010, pp. 75-124.
7. **Jie Dong**, King Ngi Ngan, Chi Keung Fong, and Wai Kuen Cham, “2D order-16 integer transforms for HD video coding,” *IEEE Transactions on Circuits and Systems for Video Technology*, Vol.19, No.10, pp.1463-1474, Oct. 2009.

For the full publication list, please visit <http://jdong.avsx.org> .

Patents (some pending)

1. US 20160212436, Inter-layer prediction for scalable video coding
2. US 20160094853, Single loop decoding based inter layer prediction
3. US 20150365666, Enhanced deblocking filters for video coding
4. US 20150256828, Adaptive upsampling for multi-layer video coding
5. US 20150172661, System and method of video coding quantization and dynamic range control
6. US 20150172616, Providing 3D look-up table (LUT) estimation for color gamut scalability
7. US 20150103898, Weighted prediction parameter signaling for video coding
8. US 20150098510, Combined scalability processing for multi-layer video coding
9. US 20140092999, Cross-plane filtering for chroma signal enhancement in video coding
10. US 20140037015, Sampling grid information for spatial layers in multi-layer video coding
11. US 20140010294, Codec architecture for multiple layer video coding
12. US 20130243091, Systems and methods for spatial prediction
13. US 20130208792, Reference picture set (RPS) signaling for scalable high efficiency video coding (HEVC)
14. US 20130114732, Video and data processing using even-odd integer transforms
15. US 8548065, Parametric interpolation filter for motion compensated prediction
16. US 8165211, Method and apparatus of de-interlacing video
17. US 8228983, Method and device for order-16 integer transform from order-8 integer cosine transform

Honors and Activities

- InterDigital Innovation Award (2012 and 2014)
- InterDigital Lucy A. Mahjoubian Distinguished Publication Award (2014)
- Publicity Chair, Organizing Committee, *2013 IEEE Visual Communication and Image Processing (VCIP 2013)*
- Member, Technical Program Committee, *IEEE International Conference on Multimedia & Expo (ICME 2012-2014)*
- Journal Refereeing
IEEE Trans. Circuits Syst. Video Technol., IEEE Trans. Circuits Syst. II, IEEE Trans. Image Process., IEEE Trans. Fuzzy Syst., Signal Process.: Image Commun., J Vis. Commun. Image Represent., etc.