

# Won-Dong Jang

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**RESEARCH  
INTERESTS** Image Segmentation  
Video Segmentation  
Deep Learning  
Connectomics

**PROFESSIONAL EXPERIENCE** **Postdoctoral Scholar** Mar. 2018 –  
School of Engineering and Applied Science  
Harvard University, Cambridge, MA  
• Advisor: Prof. Hanspeter Pfister

**Research Assistant** Feb. 2011 – Feb. 2018  
Korea University, Seoul, Korea

**EDUCATION** **Ph.D.**, Electrical Engineering Mar. 2011 – Feb. 2018  
• Korea University, Seoul, Korea  
• Advisor: Prof. Chang-Su Kim

**B.S.**, Electrical Engineering Feb. 2011  
• Korea University, Seoul, Korea

**PAPERS IN PREPARATION** [1] **Won-Dong Jang**, Donglai Wei, Zhe Sun, Brian Leahy, Helen Yang, Dalit Ben-Yosef, James Tompkin, Daniel Needleman, and Hanspeter Pfister, “Deep Shape Priors for Partially-visible Object Instance Segmentation,” is submitted to *Proc. IEEE International Conference on Computer Vision (ICCV)*, 2019.  
[2] Zudi Lin, Donglai Wei, **Won-Dong Jang**, Siyan Zhou, Xupeng Chen, Xueying Wang, Richard Schalek, Daniel Berger, Adi Suissa-Peleg, Brian Matejek, Lee Kamentsky, Toufiq Parag, Thouis Jones, Daniel Haehn, Jeff Lichtman, and Hanspeter Pfister, “Multimodal Active Clustering for Efficient Object Annotation in Connectomics,” is submitted to *Proc. IEEE International Conference on Computer Vision (ICCV)*, 2019.  
[3] Abhimanyu Talwar, Zudi Lin, Donglai Wei, Yuesong Wu, Jinglin Zhao, Bowen Zheng, **Won-Dong Jang**, Xueying Wang, Jeff Lichtman, and Hanspeter Pfister “A Topological Nomenclature for 3D ShapeAnalysis in Connectomics,” is submitted to *Proc. Medical Image Computing and Computer Assisted Interventions (MICCAI)*, 2019.

**JOURNAL PUBLICATIONS** [1] Se-Ho Lee, **Won-Dong Jang**, and Chang-Su Kim, “Tracking-by-Segmentation Using Superpixel-Wise Neural Network,” *IEEE Access*, vol. 6, pp. 54982–54993, Sep. 2018.  
[2] **Won-Dong Jang**, Tae-Young Chung, Jae-Young Sim, and Chang-Su Kim, “FDQM: Fast quality metric for depth maps without view synthesis,” *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 25, no. 7, pp. 1099–1112, Jul. 2015.  
[3] Jin-Hwan Kim, **Won-Dong Jang**, Jae-Young Sim, and Chang-Su Kim, “Optimized contrast enhancement for real-time image and video dehazing,” *Journal of Visual Communication and Image Representation*, vol. 24, no. 3, pp. 410–425, Apr. 2013.

**CONFERENCE PUBLICATIONS** [1] **Won-Dong Jang** and Chang-Su Kim, “Interactive Image Segmentation via Backpropagating Refinement Scheme,” in *Proc. IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, Long beach, CA, June. 2019.  
[2] Se-Ho Lee, **Won-Dong Jang**, and Chang-Su Kim, “Temporal superpixels based on proximity-weighted patch matching,” in *Proc. IEEE International Conference on Computer Vision (ICCV)*, Venice, Italy, Oct. 2017.

- [3] Juhyeok Mun, **Won-Dong Jang**, Deuk Jae Sung, and Chang-Su Kim, “Comparison of objective functions in CNN-based prostate magnetic resonance image segmentation,” in *Proc. IEEE International Conference on Image Processing (ICIP)*, Beijing, China, Sep. 2017.
- [4] Kyungsun Lim, **Won-Dong Jang**, and Chang-Su Kim, “Background Subtraction Using Encoder-Decoder Structured Convolutional Neural Network,” in *Proc. IEEE International Conference on Advanced Video and Signal based Surveillance (AVSS)*, Lecce, Italy, Aug. 2017.
- [5] **Won-Dong Jang** and Chang-Su Kim, “Online video object segmentation via convolutional trident network,” in *Proc. IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, Honolulu, HI, Jul. 2017.
- [6] Se-Ho Lee, **Won-Dong Jang**, and Chang-Su Kim, “Contour-constrained superpixels for image and video processing,” in *Proc. IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, Honolulu, HI, Jul. 2017.
- [7] **Won-Dong Jang** and Chang-Su Kim, “Semi-supervised video object segmentation using multiple random walkers,” in *Proc. British Machine Vision Conference (BMVC)*, York, UK, Sep. 2016.
- [8] Minhyeok Heo, **Won-Dong Jang**, and Chang-Su Kim, “Video object segmentation using multiple random walkers with GMM restart rule,” in *Proc. Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC)*, Jeju, Korea, Dec. 2016.
- [9] **Won-Dong Jang** and Chang-Su Kim, “Streaming video segmentation via short-term hierarchical segmentation and frame-by-frame Markov random field optimization,” in *Proc. European Conference on Computer Vision (ECCV)*, Amsterdam, Netherlands, Oct. 2016.
- [10] Se-Ho Lee, **Won-Dong Jang**, Byung Kwan Park, and Chang-Su Kim, “RGB-D image segmentation based on multiple random walkers,” in *Proc. IEEE International Conference on Image Processing (ICIP)*, Phoenix, AZ, Sep. 2016.
- [11] **Won-Dong Jang**, Chulwoo Lee, Chang-Su Kim, “Primary object segmentation in videos via alternate convex optimization of foreground and background distributions,” in *Proc. IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, NV, Jun. 2016.
- [12] Yeong Jun Koh, **Won-Dong Jang**, Chang-Su Kim, “POD: Discovering primary objects in videos based on evolutionary refinement of object recurrence, background, and primary object models,” in *Proc. IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, NV, Jun. 2016.
- [13] Jun-Tae Lee, Kyung-Rae Kim, **Won-Dong Jang**, and Chang-Su Kim, “Near-duplicate video clustering using multiple complementary video signatures,” in *Proc. Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC)*, Hong Kong, China, Dec. 2015.
- [14] Kyung-Rae Kim, **Won-Dong Jang**, and Chang-Su Kim, “Frame-level matching of near duplicate videos based on ternary frame descriptor and iterative refinement,” in *Proc. IEEE International Conference on Image Processing (ICIP)*, Quebec, Canada, Sep. 2015.
- [15] Chulwoo Lee, **Won-Dong Jang**, Jae-Young Sim, Chang-Su Kim, “Multiple random walkers and their application to image cosegmentation,” in *Proc. IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, Boston, MA, Jun. 2015.
- [16] **Won-Dong Jang**, Chulwoo Lee, Jae-Young Sim, and Chang-Su Kim, “Automatic video genre classification using multiple SVM votes,” in *Proc. IEEE International Conference on Pattern Recognition (ICPR)*, Stockholm, Sweden, Aug. 2014.

- [17] **Won-Dong Jang**, Jae-Young Sim, and Chang-Su Kim, “GEQM: A quality metric for gray-level edge maps based on structural matching,” in *Proc. IEEE International Conference on Acoustics, Speech, and Singal Processing (ICASSP)*, Florence, Italy, May 2014.
- [18] Tae-Young Chung, **Won-Dong Jang**, and Chang-Su Kim, “Efficient depth video coding based on view synthesis distortion estimation,” in *Proc. IEEE Visaul Communications and Image Processing (VCIP)*, San Diego, CA, Nov. 2012.
- [19] **Won-Dong Jang** and Chang-Su Kim, “SEQM: Edge quality assessment based on structural pixel matching,” in *Proc. IEEE Visaul Communications and Image Processing (VCIP)*, San Diego, CA, Nov. 2012.
- [20] Jin-Hwan Kim, **Won-Dong Jang**, Yongsup Park, Dong-Hahk Lee, Jae-Young Sim, and Chang-Su Kim, “Temporally coherent real-time video dehazing,” in *Proc. IEEE International Conference on Image Processing (ICIP)*, Orlando, FL, Sep. 2012.

## PATENTS

- [1] Young-Jin Kwak, Kyung-Rae Kim, Chang-Su Kim, **Won-Dong Jang**, Jun-Tae Lee, “Method and device for determining similarity between sequences,” US9886650 B2, Feb. 2018.
- [2] Yongsup Park, Donghahk Lee, Changsu Kim, Jinhwan Kim, **Wondong Jang**, “Image processing apparatus for removing haze contained in still image and method thereof,” US9336577 B2, May 2016.
- [3] Yongsup Park, Donghahk Lee, Changsu Kim, Jinhwan Kim, **Wondong Jang**, “Image-processing apparatus for removing haze contained in video, and method thereof,” US9275443 B2, Mar. 2016.
- [4] In-Kuk Yun, Chang-Su Kim, Chulwoo Lee, **Won-Dong Jang**, Po-Ra Kim, Se-Mi Park, Jeong-Seok Lee, and Yeong-Jun Koh, “Apparatus and method of detecting an input position with display pattern recognition,” Pub. No. US20130088425 A1, Apr. 2013.
- [5] In-Kuk Yun, Chang-Su Kim, Chulwoo Lee, **Won-Dong Jang**, Seong-Min Seo, Jeong-Seok Lee, Jeong-Seok Choi, and Yeong-Jun Koh, “Display apparatus including a pattern and method for generating a,” Pub. No. US20130082907 A1, Apr. 2013.

## PROFESSIONAL REVIEWER FOR JOURNALS ACTIVITIES

- IEEE TRANSACTIONS ON IMAGE PROCESSING
- IEEE TRANSACTIONS ON MULTIMEDIA
- IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO TECHNOLOGY
- JOURNAL OF VISUAL COMMUNICATION AND IMAGE REPRESENTATION
- ACM TRANSACTIONS ON MULTIMEDIA COMPUTING COMMUNICATIONS AND APPLICATIONS

### Reviewer for conferences

- IEEE CONFERENCE ON COMPUTER VISION AND PATTERN RECOGNITION
- ASIAN CONFERENCE ON COMPUTER VISION
- IEEE INTERNATIONAL CONFERENCE ON VISUAL COMMUNICATIONS AND IMAGE PROCESSING

## HONORS AND AWARDS

- Brain Korea (BK) 21 Graduate Student Fellowship, National Research Foundation of Korea (2011 – 2016)

## COMPUTER SKILLS

### Languages

- C/C++, MATLAB, Python

### Deep Learning

- Tensorflow, Caffe, PyTorch

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