

# Jiaya Jia

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## Appointments & Professional Qualification

Distinguished Scientist, Tencent . . . . . May 2017 – present  
Executive Director, Tencent YouTu Lab . . . . . May 2017 – present  
Professor, The Chinese University of Hong Kong . . . . . August 2015 – present  
Associate Professor, The Chinese University of Hong Kong . . . . . September 2010 – July 2015  
Assistant Professor, The Chinese University of Hong Kong . . . . . September 2004 – September 2010  
Visiting scholar at Adobe Systems, Inc. . . . . August 2007 – September 2007  
Adjunct Researcher at Microsoft Research Asia . . . . . March 2004 – August 2005  
Fellow, IEEE . . . . . January 2018 – present

## Education

- Hong Kong University of Science and Technology & Microsoft Research Asia      Hong Kong SAR  
  *Ph.D. in Computer Science*      2000 – 2004  
    – Advisor: Chi-Keung Tang and Harry Shum  
    – Thesis: Image and Video Correction by ND Tensor Voting with Intensity and Structure Consideration
- Fudan University      Shanghai, China  
  *B.S. in Computer Science*      1996 – 2000  
    – Graduation with first-class honors; GPA percentile rank 97.2%; top-grade scholarship in all years

## Research Interests

- Computer Vision; Machine Learning; Computational Imaging
- Semantic segmentation and instance segmentation
  - Image recognition and classification
  - 3D estimation and reconstruction
  - Filtering, deblurring, and super-resolution
  - Motion estimation, depth estimation, and general image matching

## Recent Professional Activities

- Associate Editor, IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)

- Editorial Board, International Journal of Computer Vision (IJCV)
- Advisory Board, Advances in Computer Vision and Pattern Recognition
- Area Chair, European Conference on Computer Vision (ECCV 2018)
- Area Chair, IEEE International Conference on Computer Vision (ICCV 2017)
- 10K Best Paper Award Committee member, IEEE ICME
- Area Chair, IEEE Computer Vision and Pattern Recognition (CVPR 2017)
- Technical Paper Program Committee member, SIGGRAPH 2016
- Area Chair, IEEE Computer Vision and Pattern Recognition (CVPR 2016)
- Technical Paper Program Committee member, SIGGRAPH Asia 2015
- Technical Paper Program Committee member, SIGGRAPH Asia 2014
- Paper Committee member, IEEE International Conference on Computational Photography (ICCP) 2013, 2014, 2015, 2016, 2017
- Area Chair, IEEE International Conference on Computer Vision (ICCV 2013)
- Poster-Demo Chair, IEEE International Conference on Computational Photography (ICCP 2013)
- Course Co-Chair, SIGGRAPH Asia 2012
- Area Chair, International Conference on Pattern Recognition (ICPR 2012)
- Area Chair, Asian Conference on Computer Vision (ACCV 2012)
- Program Committee member, IEEE International Conference on Image Processing (ICIP 2012)
- Area Chair, 13th IEEE International Conference on Computer Vision (ICCV 2011)
- Program Committee member, 3DV 2010, 2011, 2012, 2013, 2014, 2015, 2016
- Co-chair, Workshop on Interactive Computer Vision, in conjunction with ICCV 2007
- Publication Chair, ACM International Conference on Virtual Reality Continuum and Its Applications (VRCIA) 2006
- Publication Chair, ACM-HK Executive Committee 2008 – 2009
- Program Committee member, Pacific Graphics 2010, 2011, 2012, 2013, 2014, 2015, 2016
- Program Committee member, IEEE International Conference on Computer Vision 2005 – 2009
- Program Committee member, IEEE Computer Vision and Pattern Recognition 2007 – 2010
- Program Committee member, European Conference on Computer Vision 2006 – 2010

## Funded Projects

- Principal Investigator, Large Scale Semantic Image Segmentation and Classification Platform, Innovation and Technology Fund, 2017-2018, HK\$ 3,785,800
- Principal Investigator, Urban-Scale Structure-from-Motion with Feature Similarity Discovery, RGC General Research Fund, 2013-2016, HK\$ 500,000

- Co-Investigator, Personal Identification using Contactless Live 3D Finger Scans, RGC General Research Fund, 2013-2016, HK\$ 500,000
- Principal Investigator, Optical Flow for Natural Video Editing Interface, Microsoft Research Asia Grant, 2012-2014, HK\$120,000
- Principal Investigator, Robust Dense Motion Estimation for Natural Image Sequences in Computer Vision, RGC General Research Fund, 2011-2014, HK\$ 968,300
- Principal Investigator, Intelligent Video Revampment and Upsampling, Innovation and Technology Fund, 2010-2012, HK\$ 1,029,964
- Principal Investigator, High-quality Bilayer Segmentation with Motion/Depth Estimation, RGC General Research Fund, 2010-2013, HK\$ 1,036,929
- Principal Investigator, GPU based Video Editing with Depth Inference, RGC Direct Grant, 2009-2011, HK\$ 62,000
- Principal Investigator, Single Image Motion Deblurring in a Local-Structure-Oriented Framework, RGC Earmarked Grant, 2008-2010, HK\$ 310,677
- Principal Investigator, Optimizing General Image Stitching, RGC Earmarked Grant, 2007-2009, HK\$ 418,000
- Co-Investigator, Image/Video based Soft Fabric Redressing on Objects/Environment for Interactive E-Commerce Applications, RGC Earmarked Grant, 2007-2009, HK\$ 648,000
- Principal Investigator, High Dynamic Range Image and Video Rendering, Compression, and Display, SHIAE Research Grant, 2007-2009, HK\$ 620,000
- Co-Investigator, Strategic Research Area in Computer Assisted Medicine, Focused Investments Scheme C, 2006 - 2008, HK\$ 1,000,000
- Principal Investigator, Soft Color Segmentation Using Alternative Optimization, RGC Earmarked Grant, 2006-2008, HK\$ 356,000
- Principal Investigator, Texture Synthesis and Image Completion on Programmable Graphics Hardware (GPU), Microsoft Research Grant, 2006-2008, HK\$ 120,000
- Principal Investigator, Enhanced image and video completion, RGC Direct Grant, 2004-2006, HK\$ 150,000

## Awards

- 1st place in COCO Instance Segmentation Challenge 2017 and 2nd place in COCO Detection Challenge 2017
- 1st place in ImageNet Scene Parsing Challenge 2016
- Best Paper Award, NPAR 2012, for “Combining Sketch and Tone for Pencil Drawing Production”
- Research Excellence Award 2009, CUHK
- Young Researcher Award 2008, CUHK

## Student Awards

- Lu Qi, PhD Student (2017-), Hong Kong PhD Fellowship, 2017
- Li Jiang, PhD Student (2017-), Hong Kong PhD Fellowship, 2017
- Yingcong Chen, PhD Student (2016-), Hong Kong PhD Fellowship, 2016
- Ruiyu Li, PhD Student (2014-), Hong Kong PhD Fellowship, 2014
- Xiaojuan Qi, PhD Student (2014-), Hong Kong PhD Fellowship, 2014
- Jianping Shi, PhD Student (2011-2015), Google Hong Kong Anita Borg Scholarship, 2013, 2014
- Jianping Shi, PhD Student (2011-2015), Microsoft Research Asia Fellowship, 2013
- Jianping Shi, PhD Student (2011-2015), Hong Kong PhD Fellowship, 2011
- Li Xu, Ph.D (2007-2010), Microsoft Fellowship Award 2008/2009
- Qi Shan, M.Phil (2006-2008), Outstanding Thesis Award 2008, CUHK

## Functions Included in OpenCV Library

- Very fast Weighted Median Filter (WMF) (to be incorporated into OpenCV)
- Scale-aware Rolling Guidance Filter (RGF) (included in OpenCV since version 3.1.0)
- $L_0$  gradient image smoothing (included in OpenCV since version 3.1.0)
- Decolorization (included in OpenCV since version 3.0)

## Other Codes, Programs, and Executables

- Detail-revealing Deep Video Super-resolution (SPMC-VideoSR)
- PSPNet-based image cascade network (ICNet)
- Pyramid Scene Parsing Network (PSPNet)
- HDR image tone mapping code
- ACTS: Automatic Camera Tracking System
- Image upsampling executable (GPU enabled); download: 350+
- Image non-blind deconvolution executable; downloads: 400+
- Image deblurring executable; downloads: 10,000+
- Video upsampling executable; downloads: 300+

## Patents

- Luminance Correction, U.S. Patent 7317843. Jian Sun, Jiaya Jia, Heung-Yeung Shum. Issue date: Jan. 8, 2008
- Digital Cameras with Luminance Correction, U.S. Patent 7463296. Jian Sun, Jiaya Jia, Heung-Yeung Shum. Issue date: Dec. 9, 2008

- Poisson Matting for Images, U.S. Patent 7636128. Jian Sun, Jiaya Jia, Heung-Yeung Shum. Issue date: Dec. 22, 2009

## Publications

### Book Chapters

1. Chapter 1, “Mathematical models and practical solvers for uniform motion deblurring”  
Book: Motion Deblurring: Algorithms and Systems, Cambridge University Press, ISBN 9781139950466  
Editors: A. N. Rajagopalan and Rama Chellappa
2. “Matte Extraction”  
Book: Computer Vision - A Reference Guide, Springer, ISBN 9780387307718  
Editor-in-chief: Ikeuchi, Katsushi

### Refereed Papers in Journals

1. Two-Class Weather Classification  
Cewu Lu, Di Lin, Jiaya Jia, Chi-Keung Tang  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), accepted.
2. L0 Regularized Stationary Time Estimation for Crowd Analysis  
Shuai Yi, Xiaogang Wang, Cewu Lu, Jiaya Jia, Hongsheng Li  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 39, No. 5, 2017.
3. Hierarchical Image Saliency Detection on Extended CSSD  
Jianping Shi, Qiong Yan, Li Xu, Jiaya Jia  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 38, No. 4, 2016.
4. Multispectral Joint Image Restoration via Optimizing a Scale Map  
Xiaoyong Shen, Qiong Yan, Li Xu, Lizhuang Ma, Jiaya Jia  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 37, No. 12, 2015.
5. Motion Detail Preserving Optical Flow Estimation  
Li Xu, Jiaya Jia, Yasuyuki Matsushita  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 34, No. 9, 2012.
6. A Closed-Form Solution to Tensor Voting: Theory and Applications  
Tai-Pang Wu, Sai-Kit Yeung, Jiaya Jia, Chi-Keung Tang, Gerard Medioni  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 34, No. 8, 2012.
7. Robust Bilayer Segmentation and Motion/Depth Estimation with a Handheld Camera  
Guofeng Zhang, Jiaya Jia, Wei Hua, Hujun Bao  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 33, No. 3, 2011.
8. Self-Validated Labeling of Markov Random Fields for Image Segmentation  
Wei Feng, Jiaya Jia, Zhi-Qiang Liu  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 32, No. 10, 2010.

9. Consistent Depth Maps Recovery from a Video Sequence  
Guofeng Zhang, Jiaya Jia, Tien-Tsin Wong, Hujun Bao  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 31, No. 6, 2009.
10. Fractional Stereo Matching Using Expectation-Maximization  
Wei Xiong, Hin Shun Chung, Jiaya Jia  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 31, No. 3, 2009.
11. Image Stitching Using Structure Deformation  
Jiaya Jia, Chi-Keung Tang  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 30, No. 4, 2008.
12. Soft Color Segmentation and its Applications  
Yu-Wing Tai, Jiaya Jia, Chi-Keung Tang  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 29, No. 9, 2007.
13. Video Repairing Under Variable Illumination Using Cyclic Motions  
Jiaya Jia, Yu-Wing Tai, Tai-Pang Wu, Chi-Keung Tang  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 28, No. 5, 2006.
14. Tensor Voting for Image Correction by Global and Local Intensity Alignment  
Jiaya Jia, Chi-Keung Tang  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 27, No. 1, 2005.
15. Inference of Segmented Color and Texture Information by Tensor Voting  
Jiaya Jia, Chi-Keung Tang  
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**), Vol. 26, No. 6, 2004.
16. Mutual-Structure for Joint Filtering  
Xiaoyong Shen, Chao Zhou, Li Xu, Jiaya Jia  
International Journal of Computer Vision (**IJCV**), accepted.
17. Contrast Preserving Decolorization with Perceptual-Based Quality Metrics  
Cewu Lu, Li Xu, Jiaya Jia  
International Journal of Computer Vision (**IJCV**), Vol. 110, No. 2, Pages 222-239, 2014.
18. Consistent Binocular Depth and Scene Flow with Chained Temporal Profiles  
Chun Ho Hung, Li Xu, Jiaya Jia  
International Journal of Computer Vision (**IJCV**), Vol. 102, No. 1-3, Pages 271-292, 2013.
19. Regional Foremost Matching for Internet Scene Images  
Xiaoyong Shen, Xin Tao, Chao Zhou, Hongyun Gao, Jiaya Jia  
ACM Transactions on Graphics (also in **SIGGRAPH Asia** 2016), Vol. 35, No. 6, 2016.
20. Break Ames Room Illusion: Depth from General Single Images  
Jianping Shi, Xin Tao, Li Xu, Jiaya Jia  
ACM Transactions on Graphics (also in **SIGGRAPH Asia** 2015), Vol. 34, No. 6, 2015.
21. A Sparse Control Model for Image and Video Editing  
Li Xu, Qiong Yan, Jiaya Jia  
ACM Transactions on Graphics (also in **SIGGRAPH Asia** 2013), Vol. 32, No. 6, 2013.
22. Structure Extraction from Texture via Relative Total Variation  
Li Xu, Qiong Yan, Yang Xia, Jiaya Jia  
ACM Transactions on Graphics (also in **SIGGRAPH Asia** 2012), Vol. 31, No. 6, 2012.

23. Image Smoothing via L0 Gradient Minimization  
Li Xu, Cewu Lu, Yi Xu, Jiaya Jia  
ACM Transactions on Graphics (also in **SIGGRAPH Asia** 2011), Vol. 30, No. 6, 2011.
24. Modeling and Rendering of Impossible Figures  
Tai-Pang Wu, Chi-Wing Fu, Sai Kit Yeung, Jiaya Jia, Chi-Keung Tang  
ACM Transactions on Graphics, Vol. 29, No. 2, 2010 (presentation in **SIGGRAPH** 2010).
25. Fast Image/Video Upsampling  
Qi Shan, Zhaorong Li, Jiaya Jia, Chi-Keung Tang  
ACM Transactions on Graphics (also in **SIGGRAPH Asia** 2008), Vol. 27, No. 4, 2008.
26. High-Quality Motion Deblurring From a Single Image  
Qi Shan, Jiaya Jia, Aseem Agarwala  
ACM Transactions on Graphics (also in **SIGGRAPH** 2008), Vol. 2, No. 3, 2008.
27. Drag-and-Drop Pasting  
Jiaya Jia, Jian Sun, Chi-Keung Tang, Heung-Yeung Shum  
ACM Transactions on Graphics (also in **SIGGRAPH** 2006), Vol. 25, No. 3, 2006.
28. Image Completion with Structure Propagation  
Jian Sun, Lu Yuan, Jiaya Jia, Heung-Yeung Shum  
ACM Transactions on Graphics (also in **SIGGRAPH** 2005), Vol. 24, No. 3, 2005.
29. Poisson Matting  
Jian Sun, Jiaya Jia, Chi-Keung Tang, Heung-Yeung Shum  
ACM Transactions on Graphics (also in **SIGGRAPH** 2004), Vol. 23, No. 3, 2004.
30. RSCM: Region Selection and Concurrency Model for Multi-class Weather Recognition  
Di Lin, Cewu Lu, Jiaya Jia  
IEEE Transactions on Image Processing (**TIP**), Vol. 26, No. 9, 2017.
31. Efficient Non-Consecutive Feature Tracking for Robust Structure-From-Motion  
Guofeng Zhang, Haomin Liu, Zilong Dong, Jiaya Jia, Tien-Tsin Wong, Hujun Bao  
IEEE Transactions on Image Processing (**TIP**), Vol. 25, No. 12, 2016.
32. Multi-Viewpoint Panorama Construction With Wide-Baseline Images  
Guofeng Zhang, Yi He, Weifeng Chen, Jiaya Jia, Hujun Bao  
IEEE Transactions on Image Processing (**TIP**), Vol. 25, No. 7, 2016.
33. Personal Object Discovery in First-person Videos  
Cewu Lu, Renjie Liao, Jiaya Jia  
IEEE Transactions on Image Processing (**TIP**), Vol. 24, No. 12, 2015.
34. Scale Adaptive Dictionary Learning  
Cewu Lu, Jianping Shi, Jiaya Jia  
IEEE Transactions on Image Processing (**TIP**), Vol. 23, No. 2, 2014.
35. A Unified Framework for Designing Textures using Energy Optimization  
Jianbing Shen, Hanqiu Sun, Jiaya Jia, Hanli Zhao, Xiaogang Jin, Shiaofen Fang  
Pattern Recognition, Vol. 43, No. 2, 2010.
36. Efficient Keyframe-based Real-time Camera Tracking  
Zilong Dong, Guofeng Zhang, Jiaya Jia, Hujun Bao  
Computer Vision and Image Understanding (**CVIU**), Vol. 118, Pages 97-110, 2014.

37. Improving Sub-pixel Correspondence through Upsampling  
Li Xu, Jiaya Jia, Sing Bing Kang  
Computer Vision and Image Understanding (**CVIU**), Vol. 116, No. 2, 2012.
38. ImageAdmixture: Putting Together Dissimilar Objects from Groups  
Fang-Lue Zhang, Ming-Ming Cheng, Jiaya Jia, Shi-Min Hu  
IEEE Transactions on Visualization and Computer Graphics (**TVCG**), Vol. 18, No. 11, Pages 1849-1857, 2012.
39. Motion Imitation with a Handheld Camera  
Guofeng Zhang, Hanqing Jiang, Jin Huang, Jiaya Jia, Tien-Tsin Wong, Kun Zhou, Hujun Bao  
IEEE Transactions on Visualization and Computer Graphics (**TVCG**), Vol. 17, No. 10, 2011.
40. Globally Optimized Linear Windowed Tone-Mapping  
Qi Shan, Jiaya Jia, Michael S. Brown  
IEEE Transactions on Visualization and Computer Graphics (**TVCG**), Vol. 16, No. 4, 2010.
41. Re-filming with Depth-inferred Videos  
Guofeng Zhang, Zilong Dong, Jiaya Jia, Liang Wan, Tien-Tsin Wong, Hujun Bao  
IEEE Transactions on Visualization and Computer Graphics (**TVCG**), Vol. 15, No. 5, 2009.

### Refereed Papers in Major Conferences

1. Makeup-Go: Blind Reversion of Portrait Edit  
Ying-Cong Chen, Xiaoyong Shen, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2017.
2. Sequential Grouping Networks (SGN) for Instance Segmentation  
Shu Liu, Jiaya Jiay, Sanja Fidler, Raquel Urtasun  
IEEE International Conference on Computer Vision (**ICCV**), 2017.
3. Unsupervised Learning of Stereo Matching  
Chao Zhou, Hong Zhang, Xiaoyong Shen, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2017.
4. 3D Graph Neural Networks for RGBD Semantic Segmentation  
Xiaojuan Qi, Renjie Liao, Jiaya Jiay, Sanja Fidler, Raquel Urtasun  
IEEE International Conference on Computer Vision (**ICCV**), 2017.
5. Situation Recognition with Graph Neural Networks  
Ruiyu Li, Makarand Tapaswi, Renjie Liao, Jiaya Jia, Raquel Urtasun, Sanja Fidler  
IEEE International Conference on Computer Vision (**ICCV**), 2017.
6. Zero-order Reverse Filtering  
Xin Tao, Chao Zhou, Xiaoyong Shen, Jue Wang, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2017.
7. Detail-revealing Deep Video Super-resolution  
Xin Tao, Hongyun Gao, Renjie Liao, Jue Wang, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2017.
8. High-Quality Correspondence and Segmentation Estimation for Dual-Lens Smart-Phone Portraits  
Xiaoyong Shen, Hongyun Gao, Xin Tao, Chao Zhou, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2017.



9. Pyramid Scene Parsing Network  
Hengshuang Zhao, Jianping Shi, Xiaojuan Qi, Xiaogang Wang, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2017.
10. Visual Question Answering with Question Representation Update  
Ruiyu Li, Jiaya Jia  
Annual Conference on Neural Information Processing Systems (**NIPS**), 2016.
11. Deep Automatic Portrait Matting  
Xiaoyong Shen, Xin Tao, Hongyun Gao, Chao Zhou, Jiaya Jia  
European Conference on Computer Vision (**ECCV**), 2016.
12. Augmented Feedback in Semantic Segmentation under Image Level Supervision  
Xiaojuan Qi, Zhengzhe Liu, Jianping Shi, Hengshuang Zhao, Jiaya Jia  
European Conference on Computer Vision (**ECCV**), 2016.
13. Multi-scale Patch Aggregation (MPA) for Simultaneous Detection and Segmentation  
Shu Liu, Xiaojuan Qi, Jianping Shi, Hong Zhang, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2016.
14. ScribbleSup: Scribble-Supervised Convolutional Networks for Semantic Segmentation  
Di Lin, Jifeng Dai, Jiaya Jia, Kaiming He, Jian Sun  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2016.
15. Automatic Portrait Segmentation for Image Stylization  
Xiaoyong Shen, Aaron Hertzmann, Jiaya Jia, Sylvain Paris, Brian Price, Eli Shechtman, Ian Sachs  
Eurographics, 2016.
16. Video Super-Resolution via Deep Draft-Ensemble Learning  
Renjie Liao, Xin Tao, Ruiyu Li, Ziyang Ma, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2015.
17. Contour Box: Rejecting Object Proposals Without Explicit Closed Contours  
Cewu Lu, Shu Liu, Jiaya Jia, Chi-Keung Tang  
IEEE International Conference on Computer Vision (**ICCV**), 2015.
18. Semantic Segmentation With Object Clique Potentials  
Xiaojuan Qi, Jianping Shi, Shu Liu, Renjie Liao, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2015.
19. Box Aggregation for Proposal Decimation: Last Mile of Object Detection  
Shu Liu, Cewu Lu, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2015.
20. Understanding and Diagnosing Visual Tracking Systems  
Naiyan Wang, Jianping Shi, Dit-Yan Yeung, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2015.
21. Mutual-Structure for Joint Filtering  
Xiaoyong Shen, Chao Zhou, Li Xu, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2015.
22. Deep Edge-Aware Filters  
Li Xu, Jimmy Ren, Qiong Yan, Renjie Liao, Jiaya Jia  
International Conference on Machine Learning (**ICML**), 2015.

23. Just Noticeable Defocus Blur Detection and Estimation  
Jianping Shi, Li Xu, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2015.
24. Handling Motion Blur in Multi-Frame Super-Resolution  
Ziyang Ma, Renjie Liao, Xin Tao, Li Xu, Jiaya Jia, Enhua Wu  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2015.
25. Deep LAC: Deep Localization, Alignment and Classification for Fine-grained Recognition  
Di Lin, Xiaoyong Shen, Cewu Lu, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2015.
26. Photometric Stereo in the Wild  
Chun Ho Hung, Tai-Pang Wu, Yasuyuki Matsushita, Li Xu, Jiaya Jia, Chi-Keung Tang  
IEEE Winter Conference on Applications of Computer Vision (**WACV**), 2015.
27. Deep Convolutional Neural Network for Image Deconvolution  
Li Xu, Jimmy S.J. Ren, Ce Liu, Jiaya Jia  
Annual Conference on Neural Information Processing Systems (**NIPS**), 2014.
28. Discriminative Blur Detection Features  
Jianping Shi, Li Xu, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2014.
29. 100+ Times Faster Weighted Median Filter (WMF)  
Qi Zhang, Li Xu, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2014.
30. L0 Regularized Stationary Time Estimation for Crowd Group Analysis  
Shuai Yi, Xiaogang Wang, Cewu Lu, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2014.
31. Two-Class Weather Classification  
Cewu Lu, Di Lin, Jiaya Jia, Chi-Keung Tang  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2014.
32. Range-Sample Depth Feature for Action Recognition  
Cewu Lu, Jiaya Jia, Chi-Keung Tang  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2014.
33. Learning Important Spatial Pooling Regions for Scene Classification  
Di Lin, Cewu Lu, Renjie Liao, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2014.
34. Rolling Guidance Filter  
Qi Zhang, Xiaoyong Shen, Li Xu, Jiaya Jia  
European Conference on Computer Vision (**ECCV**), 2014.
35. Multi-Modal and Multi-Spectral Registration for Natural Images  
Xiaoyong Shen, Li Xu, Qi Zhang, Jiaya Jia  
European Conference on Computer Vision (**ECCV**), 2014.
36. Inverse Kernels for Fast Spatial Deconvolution  
Li Xu, Xin Tao, Jiaya Jia  
European Conference on Computer Vision (**ECCV**), 2014.

37. High-Quality Depth Recovery via Interactive Multi-View Stereo  
Weifeng Chen, Guofeng Zhang, Xiaojun Xiang, Jiaya Jia, Hujun Bao  
**3DV**, 2014.
38. Abnormal Event Detection at 150 FPS in MATLAB  
Cewu Lu, Jianping Shi, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2013.
39. CoDeL: A Human Co-detection and Labeling Framework  
Qiong Yan, Xiaoyong Shen, Li Xu, Shaojie Zhuo, Xiaopeng Zhang, Liang Shen, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2013.
40. Cross-Field Joint Image Restoration via Scale Map  
Jianping Shi, Renjie Liao, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2013.
41. Forward Motion Deblurring  
Shicheng Zheng, Li Xu, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2013.
42. Dense Scattering Layer Removal  
Qiong Yan, Li Xu, Jiaya Jia  
ACM **SIGGRAPH Asia** Technical Briefs, 2013.
43. SCMF: Sparse Covariance Matrix Factorization for Collaborative Filtering  
Jianping Shi, Naiyan Wang, Yang Xia, Dit-Yan Yeung, Irwin King, Jiaya Jia  
International Conference on Artificial Intelligence (**IJCAI**), 2013.
44. Unnatural L0 Sparse Representation for Natural Image Deblurring  
Li Xu, Shicheng Zheng, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2013.
45. Hierarchical Saliency Detection  
Qiong Yan, Li Xu, Jianping Shi, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2013.
46. Online Robust Dictionary Learning  
Cewu Lu, Jianping Shi, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2013.
47. Combining Sketch and Tone for Pencil Drawing Production  
Cewu Lu, Li Xu, Jiaya Jia  
International Symposium on Non-Photorealistic Animation and Rendering (**NPAR**), 2012.  
**Best Paper Award**
48. Scale-Invariant Optical Flow  
Li Xu, Jiaya Jia  
European Conference on Computer Vision (**ECCV**), 2012.
49. Depth-Aware Motion Deblurring  
Li Xu, Jiaya Jia  
IEEE International Conference on Computational Photography (**ICCP**), 2012.
50. Contrast Preserving Decolorization  
Cewu Lu, Li Xu, Jiaya Jia  
IEEE International Conference on Computational Photography (**ICCP**), 2012.

51. Learning Sparse Covariance Patterns for Natural Scenes  
Liwei Wang, Yin Li, Jiaya Jia, Jian Sun, David Wipf, James M. Rehg  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2012.
52. Discriminative Clustering via Generative Feature Mapping  
Liwei Wang, Xiong Li, Zhuowen Tu, Jiaya Jia  
Association for the Advancement of Artificial Intelligence (**AAAI**), 2012.
53. Simultaneous Multi-Body Stereo and Segmentation  
Guofeng Zhang, Jiaya Jia, Hujun Bao  
IEEE International Conference on Computer Vision (**ICCV**), 2011.
54. Two-Phase Kernel Estimation for Robust Motion Deblurring  
Li Xu, Jiaya Jia  
European Conference on Computer Vision (**ECCV**), 2010.
55. Efficient Non-consecutive Feature Tracking for Structure-from-Motion  
Guofeng Zhang, Zilong Dong, Jiaya Jia, Tien-Tsin Wong, Hujun Bao  
European Conference on Computer Vision (**ECCV**), 2010.
56. Motion Detail Preserving Optical Flow Estimation  
Li Xu, Jiaya Jia, Yasuyuki Matsushita  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2010.
57. Using Optical Defocus to Denoise  
Qi Shan, Jiaya Jia, Sing Bing Kang, Zenglu Qin  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2010.
58. Quasi-Dense 3D Reconstruction using Tensor-based Multiview Stereo  
Tai-Pang Wu, Sai-Kit Yeung, Jiaya Jia, Chi-Keung Tang  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2010.
59. Keyframe-Based Real-Time Camera Tracking  
Zilong Dong, Guofeng Zhang, Jiaya Jia, Hujun Bao  
IEEE International Conference on Computer Vision (**ICCV**), 2009.
60. Minimizing Sparse Higher Order Energy Functions of Discrete Variables  
Carsten Rother, Pushmeet Kohli, Wei Feng, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2009.
61. Recovering Consistent Video Depth Maps via Bundle Optimization  
Guofeng Zhang, Jiaya Jia, Tien-Tsin Wong, Hujun Bao  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2008.
62. Image Partial Blur Detection and Classification  
Renting Liu, Zhaorong Li, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2008.
63. Efficient Photometric Stereo on Glossy Surfaces with Wide Specular Lobes  
Hin Shun Chung, Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2008.
64. Segmentation Based Variational Model for Accurate Optical Flow Estimation  
Li Xu, Jianing Chen, Jiaya Jia  
European Conference on Computer Vision (**ECCV**), 2008.

65. Stereo Matching: An Outlier Confidence Approach  
Li Xu, Jiaya Jia  
European Conference on Computer Vision (**ECCV**), 2008.
66. Rotational Motion Deblurring of a Rigid Object from a Single Image  
Qi Shan, Wei Xiong, Jiaya Jia  
IEEE International Conference on Computer Vision (**ICCV**), 2007.
67. Moving Object Extraction with a Hand-held Camera  
Guofeng Zhang, Jiaya Jia, Wei Xiong, Tien-Tsin Wong, Pheng-Ann Heng, Hujun Bao  
IEEE International Conference on Computer Vision (**ICCV**), 2007.
68. Single Image Motion Deblurring Using Transparency  
Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2007.
69. Stereo Matching on Objects with Fractional Boundary  
Wei Xiong Jiaya Jia  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2007.
70. Eliminating Structure and Intensity Misalignment in Image Stitching  
Jiaya Jia and Chi-Keung Tang  
IEEE International Conference on Computer Vision (**ICCV**), 2005.
71. Local Color Transfer via Probabilistic Segmentation by Expectation-Maximization  
Yu-Wing Tai, Jiaya Jia, and Chi-Keung Tang  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2005.
72. Video Repairing: Inference of Foreground and Background Under Severe Occlusion  
Jiaya Jia, Tai-Pang Wu, Yu-Wing Tai, Chi-Keung Tang  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2004.
73. Bayesian Correction of Image Luminance with Spatial Consideration  
Jiaya Jia, Jian Sun, Chi-Keung Tang, Heung-Yeung Shum  
European Conference on Computer Vision (**ECCV**), 2004.
74. Image Registration with Global and Local Luminance Alignment  
Jiaya Jia, Chi-Keung Tang  
IEEE International Conference on Computer Vision (**ICCV**), 2003.
75. Image Repairing: Robust Image Synthesis by Adaptive ND Tensor Voting  
Jiaya Jia, Chi-Keung Tang  
IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2003.

## Graduated Students

- Xiaoyong Shen Ph.D. (2013 - 2016)  
*Thesis: Multi-Spectral Image Matching, Filtering and Restoration*
- Di Lin Ph.D. (2012 - 2016)  
*Thesis: Learning Image Representation for Classification and Segmentation*
- Jianping Shi Ph.D. (2011 - 2015)  
*Thesis: Image Blur Detection, Estimation and Analysis*

- Renjie Liao M.Phil. (2013 - 2015)  
*Thesis: Metric and Deep Learning: Applications in Computer Vision*
- Cewu Lu Ph.D. (2008 - 2013)  
*Thesis: High Sparsity Representation and Applications*
- Qiong Yan Ph.D. (2008 - 2013)  
*Thesis: Image Structure Manipulation and Its Applications*
- Qi Zhang M.Phil. (2012-2014)  
*Thesis: New Weighted Median and Scale-Aware Filters*
- Yang Xia M.Sc. (2011-2013)
  
- Liwei Wang M.Phil. (2011-2013)  
*Thesis: Learning Mid-level Representations for Scene Understanding*
- Shicheng Zheng M.Phil. (2011-2013)  
*Thesis: Generalized Image Deblurring*
- Zenglu Qin M.Phil. (2008-2012)  
*Thesis: Image Cosegmentation and Denoise*
- Li Xu Ph.D. (2007 - 2010)  
*Thesis: Topics in Motion Estimation and Motion Deblurring*
- Zhenlong Dai M.Phil. (2009 - 2012)  
*Thesis: A Link-based Video Denoising Method*
- Chun Ho Hung M.Phil. (2009 - 2011)  
*Thesis: Depth Estimation in Photometric Stereo and Stereo Matching*
- Yi Xu M.Phil. (2009 - 2011)  
*Thesis: Edge-Enhancing Image Smoothing*
- Jianing Chen M.Phil. (2007 - 2009)  
*Thesis: Motion Field Transfer*
- Qi Shan M.Phil. (2006 - 2008)  
*Thesis: Image Deblurring Methods*
- Renting Liu M.Phil. (2006 - 2008)  
*Thesis: Blur Detection and It Applications*
- Hin Shun Chung M.Phil. (2006 - 2008)  
*Thesis: A New Photometric Stereo Method*
- Chenjun Tao M. Phil. (2005 - 2008)  
*Thesis: Producing Non-photorealistic Rendering*
- Wei Xiong M. Phil. (2005 - 2007)  
*Thesis: Stereo Matching for Fractional Objects*
- Leilei Xu M. Phil. (2005 - 2007)  
*Thesis: Dynamic Texture Synthesis in Image and Video Processing*

### Current Postgraduate Advisees

- Xin Tao Ph.D. (2013-present)  
*Research topic: Low-level Vision*

- Chao Zhou Ph.D. (2014-present)  
*Research topic: Deblur*
- Shu Liu Ph.D. (2014-present)  
*Research topic: Image Recognition*
- Xiaojuan Qi Ph.D. (2014-present)  
*Research topic: Image Recognition*
- Ruiyu Li Ph.D. (2014-present)  
*Research topic: Image Recognition*
- Hongyun Gao M.Phil. (2015-present)  
*Research topic: Image Processing*
- Hong Zhang M.Phil. (2015-present)  
*Research topic: Image Understanding*
- Hengshuang Zhao Ph.D. (2015-present)  
*Research topic: Scene Recognition*
- Yingcong Chen Ph.D. (2016-present)  
*Research topic: Image Operations*
- Ruixing Wang Ph.D. (2016-present)  
*Research topic: Matting*
- Yi Wang Ph.D. (2017-present)  
*Research topic: Matting*
- Huajia LIN Ph.D. (2017-present)  
*Research topic: Depth*
- Lu QI Ph.D. (2017-present)  
*Research topic: Segmentation*
- Li JIANG Ph.D. (2017-present)  
*Research topic: Depth*
- Ruizheng WU Ph.D. (2017-present)  
*Research topic: Image Generation*

## Staff

- Xiaoyong Shen, Postdoc (2016)
- Li Xu, Postdoc (2010-2013)
- Tai-Pang Wu, Postdoc (2010)
- Wei Feng, Postdoc (2008)

## Teaching

- 2016 - 2017 (Spring): CSCI3290 Introduction to Computational Photography
- 2015 - 2016 (Fall): ENGG5104 Image Processing and Computer Vision
- 2015 - 2016 (Spring): CSCI3290 Introduction to Computational Photography

- 2014 - 2015 (Fall): ENGG5104 Image Processing and Computer Vision
- 2014 - 2015 (Spring): CSCI3290 Introduction to Computational Photography
- 2013 - 2014 (Fall): ENGG5104 Image Processing and Computer Vision
- 2013 - 2014 (Spring): CSCI3290 Introduction to Computational Photography
- 2012 - 2013 (Fall): CSCI5280 Image Processing and Computer Vision
- 2011 - 2012 (Fall): CSC5280 Image Processing and Computer Vision
- 2011 - 2012 (Spring): CSC3260B Principles of Computer Graphics
- 2010 - 2011 (Fall): CSC3260B Principles of Computer Graphics
- 2009 - 2010 (Fall): CSC3260B Principles of Computer Graphics
- 2009 - 2010 (Spring): CSC5280 Image Processing and Computer Vision
- 2008 - 2009 (Fall): CSC3260B Principles of Computer Graphics
- 2008 - 2009 (Spring): CSC5280 Image Processing and Computer Vision
- 2007 - 2008 (Fall): CSC3260B Principles of Computer Graphics
- 2007 - 2008 (Spring): CSC5280 Image Processing and Computer Vision
- 2006 - 2007 (Fall): CSC5280 Image Processing and Computer Vision
- 2006 - 2007 (Spring): CSC2110 Discrete Mathematics
- 2005 - 2006 (Spring): CSC3150 Introduction to Operating Systems
- 2004 - 2005 (Fall): CSC3150 Introduction to Operating Systems
- 2004 - 2005 (Spring): CSC3190 Introduction to Discrete Mathematics and Algorithms