

Wei Shen



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Research Interests

Computer Vision, Deep Learning, Low-level Vision, Random Forests, Object Recognition and Detection, Biomedical Image Analysis.

Short Bio

Wei Shen received his B.S. and Ph.D. degree both in Electronics and Information Engineering from the Huazhong University of Science and Technology (HUST), Wuhan, China, in 2007 and in 2012. From April 2011 to November 2011, he worked in Microsoft Research Asia as an intern. In 2012, he joined the School of Communication and Information Engineering, Shanghai University and served as an assistant and associate professor until Oct 2018. In 2016, he started his visit at the Department of Computer Science, Johns Hopkins University, hosted by Prof. Alan Yuille. He is currently an Assistant Research Professor at the Department of Computer Science, Johns Hopkins University. He has over 40 peer-reviewed publications in machine learning and computer vision related areas, including IEEE Trans. PAMI, IEEE Trans. Image Processing, NIPS, ICML, ICCV, CVPR and ECCV.

Education

- Sep 2007 – Jun 2012 **Huazhong University of Science and Technology**, Wuhan, P.R. China
Ph.D. of Information and Communication Engineering,
Dept. of Electronics & Information Engineering
- Sep 2003 – Jun 2007 **Huazhong University of Science and Technology**, Wuhan, P.R. China
Bachelor degree of Communication Engineering,
Dept. of Electronics & Information Engineering

Experience

- Nov 2018 - present **Assistant Research Professor**, Dept. of Computer Science, Johns Hopkins University
- May 2016–Oct 2018 **Visiting Assistant/Associate Professor**, Dept. of Computer Science, Johns Hopkins University.
(Hosted by Prof. Alan Yuille)
- Mar 2017 – Oct 2018 **Associate Professor**, School of Communications and Information Engineering,
Shanghai University.
- Jul 2012 – Feb 2017 **Assistant Professor**, School of Communications and Information Engineering,
Shanghai University.
- Apr 2011 – Nov 2011 **Intern**, Visual Computing Group, Microsoft Research Asia. (Supervised by Prof. Zhuowen Tu)

Book Chapter

Wei Shen, Kai Zhao, Yuan Jiang, Yan Wang, Zhijiang Zhang, Xiang Bai. **Skeletonization in Natural Images and Its Application to Object Recognition**, in "Skeletonization: Theory, Methods, and Applications", Punam Saha, Gunilla Borgefors, Gabriella Sanniti di Baja (Ed.), Academic Press, 2017. ISBN: 978-0-081-01291-8.

Selected Papers

- [1] Peng Tang, Xinggang Wang, Song Bai, **Wei Shen**, Xiang Bai, Wenyu Liu, Alan Yuille. PCL: Proposal Cluster Learning for Weakly Supervised Object Detection. *IEEE Trans. Pattern Analysis and Machine Intelligence*, 2018.
- [2] **Wei Shen**, Yilu Guo, Yan Wang, Kai Zhao, Bo Wang, Alan Yuille. Deep Regression Forests for Age Estimation. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Salt Lake City, USA, 2018.
- [3] Siyuan Qiao, Chenxi Liu, **Wei Shen**, Alan Yuille. Few-Shot Image Recognition by Predicting Parameters from Activations. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Salt Lake City, USA, 2018.
- [4] Zhishuai Zhang, Siyuan Qiao, Cihang Xie, **Wei Shen**, Bo Wang, Alan Yuille. Single-Shot Object Detection with Enriched Semantics. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Salt Lake City, USA, 2018.
- [5] Siyuan Qiao, **Wei Shen**, Zhishuai Zhang, Bo Wang, Alan Yuille. Deep Co-Training for Semi-Supervised Image Recognition. *European Conference on Computer Vision (ECCV)*, Munich, Germany, 2018.
- [6] Siyuan Qiao, Zhishuai Zhang, **Wei Shen**, Bo Wang, Alan Yuille. Gradually Updated Neural Networks for Large-Scale Image Recognition. *International Conference on Machine Learning (ICML)*, Stockholm, Sweden, 2018.
- [7] Kai Zhao, **Wei Shen**, Shanghua Gao, Dandan Li, Ming-Ming Cheng. Hi-Fi: Hierarchical Feature Integration for Skeleton Detection. *International Joint Conference on Artificial Intelligence (IJCAI)*, Stockholm, Sweden, 2018.
- [8] Yan Wang, Yuyin Zhou, Peng Tang, **Wei Shen**, Elliot K. Fishman, Alan Yuille. Training Multi-organ Segmentation Networks with Sample Selection by Relaxed Upper Confident Bound. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, Granada, Spain, 2018.
- [9] Zhuotun Zhu, Yingda Xia, **Wei Shen**, Elliot K. Fishman, Alan Yuille. A 3D Coarse-to-Fine Framework for Automatic Pancreas Segmentation. *International Conference on 3D Vision (3DV)*, Verona, Italy, 2018.
- [10] **Wei Shen**, Chenting Du, Yuan Jiang, Dan Zeng, Zhijiang Zhang. Bag of Shape Features with A Learned Pooling Function for Shape Recognition. *Pattern Recognition Letters*, 106(15): 33 - 40, 2018.
- [11] Dan Zeng, Fan Zhao, Shiming Ge, **Wei Shen**. Fast Cascade Face Detection with Pyramid Network. *Pattern Recognition Letters*, 2018.
- [12] **Wei Shen**, Kai Zhao, Yuan Jiang, Yan Wang, Xiang Bai, Alan Yuille. DeepSkeleton: Learning Multi-task Scale-associated Deep Side Outputs for Object Skeleton Extraction in Natural Images. *IEEE Trans. Image Processing*. 26(11): 5298 – 5311, 2017.
- [13] **Wei Shen**, Kai Zhao, Yilu Guo, Alan Yuille. Label Distribution Learning Forests. *Advances in Neural Information Processing Systems (NIPS)*, Long Beach, USA, 2017.
- [14] **Wei Shen**, Bin Wang, Yuan Jiang, Yan Wang, Alan Yuille. Multi-stage Multi-recursive-input Fully Convolutional Networks for Neuronal Boundary Detection. *IEEE International Conference on Computer Vision (ICCV)*, Venice, Italy, 2017.
- [15] Siyuan Qiao, **Wei Shen**, Weichao Qiu, Chenxi Liu, Alan Yuille. ScaleNet: Guiding Object Proposal Generation in Supermarkets and Beyond. *IEEE International Conference on Computer Vision (ICCV)*, Venice, Italy, 2017.
- [16] Christopher Funk, Seungkyu Lee, Martin R. Oswald, Stavros Tsogkas, **Wei Shen**, Andrea Cohen, Sven Dickinson, Yanxi Liu. 2017 ICCV Challenge: Detecting Symmetry in the Wild. *IEEE International Conference on Computer Vision Workshop*, Venice, Italy, 2017.
- [17] **Wei Shen**, Wenjing Gao, Yuan Jiang, Dan Zeng, and Zhijiang Zhang. Shape Recognition by Bag of Contour Fragments with A Learned Pooling Function. *IEEE International Conference on Image Processing (ICIP)*, Beijing, China, 2017.

- [18] Yuyin Zhou, Lingxi Xie, **Wei Shen**, Yan Wang, Elliot Fishman, Alan Yuille. A Fixed-Point Model for Pancreas Segmentation in Abdominal CT Scans. *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*, Quebec, Canada, 2017.
- [19] Dan Zeng, Lidan Wu, Boyang Chen, **Wei Shen**. Slope-Restricted Multi-Scale Feature Matching for Geostationary Satellite Remote Sensing Images. *Remote Sensing*, 2017.
- [20] Dan Zeng, Fan Zhao, **Wei Shen**, Shiming Ge. Compressing and Accelerating Neural Network for Facial Point Localization. *Cognitive Computation*, 2017.
- [21] Dan Zeng, Ting Zhang, Rui Fang, **Wei Shen**, Qi Tian. Neighborhood Geometry Based Feature Matching for Geostationary Satellite Remote Sensing Image. *Neurocomputing*, 236: 65-72, 2017.
- [22] **Wei Shen**, Kai Zhao, Yuan Jiang, Yan Wang, Zhijiang Zhang, Xiang Bai. Object Skeleton Extraction in Natural Images by Fusing Scale-associated Deep Side Outputs. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, USA, 2016.
- [23] Zheng Zhang, Chenquan Zhang, **Wei Shen**, Cong Yao, Wenyu Liu, Xiang Bai. Multi-Oriented Text Detection with Fully Convolutional Networks. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, USA, 2016.
- [24] **Wei Shen**, Xiang Bai, Zihao Hu, Zhijiang Zhang. Multiple Instance Subspace Learning via Partial Random Projection Tree for Local Reflection Symmetry in Nature Images. *Pattern Recognition*. 52(4): 306-316, 2016.
- [25] **Wei Shen**, Yuan Jiang, Wenjing Gao, Dan Zeng, Xinggang Wang. Shape Recognition by Bag of Skeleton-associated Contour Parts. *Pattern Recognition Letters*, 83: 321-329, 2016.
- [26] **Wei Shen**, Xinggang Wang, Yan Wang, Xiang Bai, Zhijiang Zhang. DeepContour: A Deep Convolutional Feature Learned by Positive-sharing Loss for Contour Detection. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Boston, USA, 2015.
- [27] Zheng Zhang, **Wei Shen**, Cong Yao, Xiang Bai. Symmetry-Based Text Line Detection in Natural Scenes. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Boston, USA, 2015.
- [28] Shifu Zhou, **Wei Shen**, Dan Zeng, Zhijiang Zhang. Unusual Event Detection in Crowded Scenes by Trajectory Analysis. *International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Brisbane, Australia, 2015.
- [29] **Wei Shen**, Ke Deng, Xiang Bai, Tommer Leyvand, Baining Guo, Zhuowen Tu. Exemplar-based human action pose correction. *IEEE Trans. Cybernetics*, 44(7): 1053-1066, 2014.
- [30] **Wei Shen**, Rui Lei, Dan Zeng, Zhijiang Zhang. Regularity guaranteed human pose correction. *Asian Conference on Computer Vision (ACCV)*, Singapore, 2014.
- [31] **Wei Shen**, Yan Wang, Xiang Bai, Hongyuan Wang, Longin Jan Latecki. Shape clustering: Common structure discovery. *Pattern Recognition* 46(2): 539-550, 2013.
- [32] **Wei Shen**, Bo Wang, Yueming Wang, Xiang Bai, Longin Jan Latecki. Face identification using reference-based features with message passing model. *Neurocomputing*, 99: 339-346, 2013.
- [33] **Wei Shen**, Xiang Bai, Xingwei Yang, Longin Jan Latecki. Skeleton pruning as trade-off between skeleton simplicity and reconstruction error. *SCIENCE CHINA Information Sciences*, 56(4): 1-14, 2013.
- [34] Ying Li, **Wei Shen**, Xun Shi, Zhijiang Zhang. Ensemble of randomized linear discriminant analysis for face recognition with single sample per person. *International Conference Automatic Face and Gesture Recognition (FG)*, Shanghai, China, 2013.
- [35] **Wei Shen**, Ke Deng, Xiang Bai, Tommer Leyvand, Baining Guo, Zhuowen Tu. Exemplar-based human action pose correction and tagging. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 1784-1791, Providence, USA, 2012.
- [36] **Wei Shen**, Xiang Bai, Rong Hu, Hongyuan Wang, Longin Jan Latecki. Skeleton growing and pruning with bending potential ratio. *Pattern Recognition* 44(2): 196-209, 2011.
- [37] Rong Hu, **Wei Shen**, Hongyuan Wang. Recursive spatiotemporal subspace learning for gait recognition. *Neurocomputing*, 73(10-12): 1892-1899, 2010.

- [38] Bo Wang, **Wei Shen**, Wenyu Liu, Xinge You, Xiang Bai. Shape classification using tree unions. *International Conference on Pattern Recognition (ICPR)*, pp. 983-986, Istanbul, Turkey, 2010.

Patents

- [1] “ESTIMATED POSE CORRECTION”, Inventors: Zhuowen Tu, **Wei Shen**, Ke Deng, Tommer Leyvand, Baining Guo. US Patent Application 20130251192.

Grants

- 2017 - 2020 Object proposal detection by deep shape feature extraction in natural images,
National Natural Science Foundation of China, No. 61672336. (PI)
- 2016 - 2018 Contour detection by deep convolutional neural networks,
“Chen Guang” project supported by Shanghai Municipal Education Commission and Shanghai Education Development Foundation, No. 15CG43. (PI)
- 2014 - 2016 Research on skeleton extraction and object recognition in natural images by supervised learning,
National Natural Science Foundation of China, No. 61303095. (PI)
- 2014 - 2016 Symmetry based object representation and recognition in natural images
Innovation Program of Shanghai Municipal Education Commission, No. 14YZ018. (PI)
- 2014 - 2016 Symmetry based object localization in natural images,
Research Fund for the Doctoral Program of Higher Education of China, No. 20133108120017. (PI)

Academic Service

Journal Reviewer: IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Image Processing, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Transactions on Cybernetics, IEEE Transactions on Multimedia, Pattern Recognition, Neurocomputing, Pattern Recognition Letters, The Visual Computer

Conference Reviewer: ECCV 2016, AAAI 2017, CVPR 2017, ICCV 2017, AAAI 2018, CVPR 2018, ECCV 2018, AAAI 2019, CVPR 2019

Workshop Organizer: CVPR 2017 Workshop Challenge: PASCAL in Detail;

ICCV 2017 Workshop challenge: Detecting Symmetry in the Wild

Committee Member: Computer Vision Task Forces, China Computer Federation (CCF)