

Wanli Ouyang

CONTACT INFORMATION

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EDUCATION

- Ph.D. student in Electronic Engineering, graduation: 2007-2010.
The Chinese University of Hong Kong, Hong Kong, China.
GPA: 3.93/4
Advisor: Prof. Wai-Kuen Cham
- M.S. in Computer science, 2003-2006
Beijing University of Technology, Beijing, China.
Ranking: 1/123
Advisor: Prof. Chuangbai Xiao
- B.S. in Computer science, 1999-2003
Xiangtan University, Xiangtan, Hunan, China.
Ranking: 3/400

RESEARCH HIGHLIGHTS

23 papers on CVPR, ICCV, ICML and ECCV. 4 papers on TPAMI, 1 paper on TIP, 1 paper on CSVT, 1 IJCV paper. Google scholar citation 1079, h-index 16 (until 2016/May/4).

Object detection is one of the most important research topics in computer vision. ImageNet Large Scale Visual Recognition Challenge (ILSVRC) is the most recognized challenge for research on object detection and recognition. Many research groups, such as Google, Microsoft, Baidu, UC-berkeley, Oxford, have joined this challenge. The team led by me ranked as the 2nd in this challenge, next to Google in ILSVRC 2014. We ranked as the 1st for object detection from video and the 2nd for object detection from still images in ILSVRC 2015. Awarded as the ICCV2015 outstanding reviewer.

PROFESSIONAL SOCIETIES

IEEE Member

PROFESSIONAL EXPERIENCE

- Jan. 2011-Sep. 2013, Post-doctoral fellow, Department of Electronic Engineering, The Chinese University of Hong Kong, Hong Kong.
- Oct. 2013-now, Research Assistant Professor, Department of Electronic Engineering, The Chinese University of Hong Kong, Hong Kong.

CONTACT OF REFEREE

- Xiaogang Wang, xgwang@ee.cuhk.edu.hk, the department of Electronic Engineering, the Chinese University of Hong Kong
- Xiao'ou Tang, xtang@ie.cuhk.edu.hk, the department of Information Engineering, the Chinese University of Hong Kong
- Wai-Kuan Cham, wkcham@ee.cuhk.edu.hk, the department of Electronic Engineering, the Chinese University of Hong Kong

RESEARCH GRANTS

- Principal Investigator, Human pose estimation and social interaction recognition with deep neural networks (Project number: CUHK 14206114), sponsored by Research Grants Council - General Research Fund, 01/01/2015-31/12/2017, HKD

500,000.

- Principal Investigator, Deformable and rotatable contextual deep learning for generic object detection (Project number: CUHK 14205615), sponsored by Research Grants Council - General Research Fund, 01/10/2015-30/9/2018, HKD 695,861.
- Co-Investigator, Using deep learning to support urban land use classification with optical imagery and LiDAR Ddata (Project number: CUHK 14606315), sponsored by Research Grants Council - General Research Fund, 01/10/2015-30/9/2018, HKD 585,000.

Publication List

- Highlights
 - According to Google Scholar Metrics, CVPR is the top publication venue in the field of computer vision and pattern recognition, according to the h5-index, a citation measure for the recent five years. (PAMI and ICCV rank second and third, respectively.) CVPR also ranks 6th in the category of Engineering and Computer Science, and it is the highest-ranked venue in Computer Science.
 - 5 papers on IEEE Trans. on PAMI (IF=5.694) [1, 2, 5, 7, 10], 1 paper accepted on IJCV [3], 2 papers on other IEEE Transactions [4, 6], 15 papers on CVPR [17–22, 26, 27, 29, 30, 35–39], 6 papers on ICCV [23–25, 32–34], 1 paper on ICML [16], 3 paper on ECCV [28].
 - 23 papers on deep learning at TPAMI, IJCV, CVPR, ICCV, ECCV, and CSVT [1, 3, 4, 14–28, 30, 32, 33, 35, 38].
 - 22 papers on locating objects and persons at CVPR, ICCV, ECCV, IJCV, TIP, TCSVT, and TPAMI [1–7, 10, 14, 17, 19, 22, 23, 25–29, 32, 33, 35, 38, 39].
 - 19 papers on person detection, tracking, and interaction recognition [2–5, 18, 20, 21, 24, 25, 28–30, 32–38].
 - At CVPR 2012, there were only two papers on deep learning, one is from Wanli Ouyang; at ICCV 2013, there were eight papers on deep learning, and two of them were from Wanli Ouyang and his supervised student.
 - ILSVRC is referred to as the Olympics in computer vision. Extending the deep models developed in [32] and [33], we ranked No.2 (object detection task) in the ImageNet Large Scale Visual Recognition Challenge (ILSVRC) 2014. The mean average precision has been significantly improved from 22.58% (best performance of ILSVRC 2013) to 50.7% in our CVPR 2015 paper [26]. In ILSVRC 2015, we ranked No. 1 in object detection from video and No. 2 in object detection from still images .
- Student Author Notations.
 - *student

JOURNAL
PUBLICATIONS

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References

- [1] **Wanli Ouyang**, Xiaogang Wang, et. al. “DeepID-Net: Object Detection with Deformable Part Based Convolutional Neural Networks”, *IEEE Trans. Pattern Anal. Mach. Intell. (PAMI)*, accepted, 2016.
- [2] *R. Zhao, **W. Ouyang (Correspondence author)**, X. Wang, “Person Re-identification by Saliency Learning”, *IEEE Trans. Pattern Anal. Mach. Intell. (PAMI)*, accepted, 2016.

- [3] **W. Ouyang**, X. Zeng, X. Wang, "Learning Mutual Visibility Relationship for Pedestrian Detection with a Deep Model", *International Journal of Computer Vision (IJCV)*, accepted, 2016.
- [4] **W. Ouyang**, X. Zeng, X. Wang, "Partial Occlusion Handling in Pedestrian Detection with a Deep Model", *IEEE Trans. Circuits Syst. Video Technol. (CSVT)*, accepted, 2015.
- [5] **W. Ouyang**, X. Zeng and X. Wang, "Single-Pedestrian Detection Aided by Two-Pedestrian Detection", *IEEE Trans. Pattern Anal. Mach. Intell. (PAMI)*, 37(9):1875 - 1889, Sept. 2015.
- [6] **W. Ouyang**, R. Zhang and W.-K. Cham, "Segmented Gray-Code Kernels for Fast Pattern Matching", *IEEE Trans. Image Process. (TIP)*, 22(4):1512-1525, Apr. 2013.
- [7] **W. Ouyang**, F. Tombari, S. Mattocchia, L. D. Stefano, and W.-K. Cham, "Performance Evaluation of Full Search Equivalent Pattern Matching Algorithms," *IEEE Trans. Pattern Anal. Mach. Intell. (PAMI)*, 34(1):127-143, Jan. 2012.
- [8] F. Tombari, **W. Ouyang**, L. Di Stefano, W.K. Cham, "Adaptive Low Resolution Pruning for Fast Full Search Equivalent Pattern Matching," *Pattern Recognition Letters (JPRL)*, 32(15), 2119-2127, November 2011.
- [9] R. Zhang, **W. Ouyang** and W.-K. Cham, "Image Postprocessing by Non-local Kuan's Filter," *Journal of Visual Communication and Image Representation.*, Elsevier, 22 (2011), pp. 251-262.
- [10] **W. Ouyang** and W.-K. Cham, "Fast algorithm for Walsh Hadamard transform on sliding windows", *IEEE Trans. Pattern Anal. Mach. Intell.(PAMI)*, 32(1):165-171, Jan. 2010.
- [11] R. Zhang, **W. Ouyang** and W.-K. Cham, "Image Edge Detection Using Hidden Markov Chain Model Based on the Non-decimated Wavelet", *Int. Journal of Signal Processing, Image Processing and Pattern*, 1(2):pp.109-117, Mar. 2009.
- [12] **W. Ouyang**, C. Xiao, and G. Liu. "A new IDCT and motion compensation algorithm based on very long instruction word (VLIW) (in Chinese)", *ACTA ELECTRONICA SINICA (One of the best Electronic Engineering journals in China)*, 33(11):2074-2079, Nov. 2005.
- [13] C. Xiao, **W. Ouyang** and G. Liu. "Loop Optimization Study on the Inverse Scan and Inverse Quantization Based on VLIW" (in Chinese), *Journal of Beijing University of Technology*, 31(4):374-378, 2005.
- [14] *Z. Wang, H. Li, W. Ouyang, X. Wang. "Learnable Histogram: Statistical Context Features for Deep Neural Networks", European Conf. on Computer Vision (ECCV), 2016.
- [15] *Xingyu Zeng, **Wanli Ouyang**, Bin Yang, Junjie Yan, Xiaogang. "Gated Bidirectional CNN for Object Detection", European Conf. on Computer Vision (ECCV), 2016.
- [16] *Hongyang Li, **Wanli Ouyang**, Xiaogang Wang "Multiple Bias on Non-linearity Activation in Deep Neural Networks", In Proc. ICML 2016.

CONFERENCE
PUBLICATIONS

- [17] **W. Ouyang**, X. Wang, C. Zhang, and X. Yang. "Factors in finetuning deep model for object detection with long-tail distribution". In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, 2016.
- [18] T. Xiao, H. Li, **W. Ouyang**, and X. Wang. "Learning Deep Feature Representations with Domain Guided Dropout". In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, 2016.
- [19] *K. Kang, **W. Ouyang**, H. Li, X. Wang. "Object Detection from Video Tubelets with Convolutional Neural Networks". In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, 2016.
- [20] *W. Yang, **W. Ouyang**, H. Li, X. Wang. "End-to-End Learning of Deformable Mixture of Parts and Deep Convolutional Neural Networks for Human Pose Estimation". In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, 2016 (**Oral**).
- [21] *X. Chu, **W. Ouyang**, H. Li, and X. Wang. "Structured feature learning for pose estimation". In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, 2016.
- [22] *L. Wang, **W. Ouyang**, X. Wang, and H. Lu. "STCT: Sequentially training convolutional networks for visual tracking". In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, 2016.
- [23] **Wanli Ouyang**, Hongyang Li, Xingyu Zeng, Xiaogang Wang, "Learning Deep Representation with Large-scale Attributes", In *Proc. IEEE Int. Conf. Computer vision (ICCV)*, 2015.
- [24] *Xiao Chu, *Wei Yang, **Wanli Ouyang**, Xiao gang Wang, "Multi-task Recurrent Neural Network for Immediacy Prediction", In *Proc. IEEE Int. Conf. Computer vision (ICCV)*, 2015 (**Oral**).
- [25] *Lijun Wang, **Wanli Ouyang**, Xiaogang Wang, Huchuan Lu, "Visual Tracking with Fully Convolutional Networks", In *Proc. IEEE Int. Conf. Computer vision (ICCV)*, 2015.
- [26] **Wanli Ouyang**, Xiaogang Wang, Xingyu Zeng, Shi Qiu, Ping Luo, Yonglong Tian, Hongsheng Li, Shuo Yang, Zhe Wang, Chen-Change Loy and Xiaoou Tang, "DeepID-Net: Deformable Deep Convolutional Neural Networks for Object Detection", In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, 2015.
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- [30] **W. Ouyang**, X. Chu, and X. Wang, "Multi-source Deep Learning for Human Pose Estimation," In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, Columbus, USA, Jun. 2014.

- [31] Wang, J. F., Choy, C. S., Chao, T. L., Kit, K. C., Pun, K. P., **Ouyang, W. L.**, Wang, X. G. (2014, November). Simplifying HOG arithmetic for speedy hardware realization. In *Circuits and Systems (APCCAS), 2014 IEEE Asia Pacific Conference on* (pp. 61-64). *IEEE*.
- [32] **W. Ouyang**, and X. Wang, "Joint Deep Learning for Pedestrian Detection," In *Proc. IEEE Int. Conf. Computer vision (ICCV)*, Sydney, Australia, Dec. 2013.
- [33] *X. Zeng, **W. Ouyang**, and X. Wang, "Multi-Stage Contextual Deep Learning for Pedestrian Detection," In *Proc. IEEE Int. Conf. Computer vision (ICCV)*, Sydney, Australia, Dec. 2013.
- [34] *Rui Zhao, **W. Ouyang**, and X. Wang, "Person Re-identification by Saliency Matching," In *Proc. IEEE Int. Conf. Computer vision (ICCV)*, Sydney, Australia, Dec. 2013.
- [35] **W. Ouyang**, X. Zeng, and X. Wang, "Modeling Mutual Visibility Relationship in Pedestrian Detection," In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, Portland, USA, Jun. 2013.
- [36] **W. Ouyang**, and X. Wang, "Single-Pedestrian Detection aided by Multi-pedestrian Detection," In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, Portland, USA, Jun. 2013.
- [37] *Rui Zhao, **W. Ouyang**, and X. Wang, "Unsupervised Saliency Learning for Person Re-identification," In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, Portland, USA, Jun. 2013.
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- [39] **W. Ouyang**, R. Zhang and W.-K. Cham, "Fast pattern matching using orthogonal Haar transform". In *Proc. IEEE Int. Conf. Computer vision and pattern recognition (CVPR)*, San Francisco, USA, Jun. 2010.
- [40] Xiao, R., Xiao, C., **Ouyang, W.**, and Cham, W. K. (2010, December). "Fast pattern matching using Black Sheep algorithm". In *Intelligent Signal Processing and Communication Systems (ISPACS), 2010 International Symposium on* (pp. 1-4). *IEEE*.
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- [44] **W. Ouyang**, C. Xiao, W. Ju and D. Song. *The dynamic range acquisition of DCT and IDCT algorithms*. In IEEE Midwest sym. Circuits and Syst. (MWCAS), 2005.

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- [46] **Ouyang, W.**, Chuangbai Xiao, Wenqi, Ju and Dandan Song. *Optimal Word Length Study on DCT and IDCT Algorithms*. In Proc. the 8th International Conference for Young Computer Scientists, 2005.

AWARDS

- Rank as #1 in the ILSVRC2015 for object detection from video, 2015.
- Rank as #2 in the ILSVRC2015 for object detection from still images, 2015.
- Rank as #2 in the ILSVRC2014 for object detection from still images, 2014.
- Outstanding reviewer award, ICCV 2015.
- IEEE CVPR Doctoral Consortium grant, 2010
- First-class tutor award, the Chinese University of Hong Kong, 2009
- Best presentation award in the 3rd Beijing Hong Kong International Forum, 2008
- Excellent Master Thesis, Beijing University of technology, 2006
- First class Science and Technology award, Beijing University of technology, 2006
- Excellent graduate student scholarship for two years, 2004, 2005
- National scholarship of China, 2000
- Excellent undergraduate student scholarship for three successive years, 1999-2002

RESEARCH ACTIVITIES

- Program Chair of Asian Conference on Computer Vision (ACCV) Workshop on Deep Learning on Visual Data, 2014
- Program Chair of The 21st International Conference on Neural Information Processing 2014, workshop on Deep Learning in Image Understanding
- Organizing chair of the 5th BJ-HK International Doctoral Forum 2010
- Track chair of the 4th BJ-HK International Doctoral Forum 2009
- Member of the Institute of Electrical and Electronics Engineers (IEEE)
- Reviewer of the following journals and conferences
 - IEEE Transactions on Pattern Analysis and Machine Intelligence
 - International Journal of Computer Vision
 - IEEE Transactions on Image Processing
 - IEEE Transactions on Signal Processing
 - IEEE Transactions on Intelligent Transportation Systems
 - IEEE Transactions on Circuits and Systems I
 - IEEE Transactions on Circuits and Systems for Video Technology
 - IEEE Transactions on Neural Networks and Learning Systems
 - IEEE Transactions on Systems, Man, and Cybernetics
 - IEEE Signal Processing Magazine
 - Pattern Recognition
 - Neurocomputing
 - Signal Processing: Image Communication
 - Journal of Visual Communication and Image Representation
 - Journal of Electronic Imaging
 - Journal of Image and Vision Computing

- IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2012
- IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2013
- IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2014
- IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2015
- IEEE International Conference on Computer Vision and Pattern Recognition (CVPR) 2016
- IEEE International Conference on Computer Vision (ICCV) 2011
- European Conference on Computer Vision (ECCV) 2012
- IEEE International Conference on Computer Vision (ICCV) 2013
- European Conference on Computer Vision (ECCV) 2014
- IEEE International Conference on Computer Vision (ICCV) 2015
- International Conference on Signal Processing and Multimedia Applications 2010
- International Conference on Image and Signal Processing 2005

TEACHING
EXPERIENCE

The Chinese University of Hong Kong, Hong Kong, China

Teacher

2015-2016

- **Digital image processing** for undergraduate students.

Teaching assistant

2007-2009

- Random Process and Digital Signal Processing
 - Sept. - Dec., 2007/2008/2009
 - Responsible for 1 hour lecture each week and evaluation of assignments, projects and tests
 - Maintain a course web page archived at <http://www.ee.cuhk.edu.hk/~wlouyang/ele3410/index.html>
- Advanced Digital Signal Processing and Applications
 - Jan. - May. 2008
 - Advanced Digital Signal Processing and Applications
 - Responsible for 1 hour lecture each week and evaluation of assignments, projects and tests
- Signals and systems
 - Jan. - May. 2009/2010
 - Responsible for 1 hour lecture each week and evaluation of assignments, projects and tests
 - Maintain a course web page archived at <http://www.ee.cuhk.edu.hk/~wlouyang/ele3410/index.html>

HOBBIES

Soccer (joined the football match in the university).

TECHNICAL SKILLS MATLAB experience: linear algebra, Fourier transforms, nonlinear numerical methods, polynomials, statistics, N -dimensional filters, visualization, optimization tools

Embedded Systems: Software and hardware development with several DSP platforms, e.g. NXP (previously Phillips), Aura.

Parallel programming: Have written assembly language and C language for DSPCPU that has 5 processing units. Have strong knowledge about pipelining and cache optimization.

Programming: Matlab, C, C++, OpenCV, Microsoft visual studio, Pascal, GNU make, SVN.

Computer Applications: T_EX (L^AT_EX, B_IB_TE_X), most common productivity packages (for Windows, OS X, and Linux platforms), Vim

Operating Systems: Microsoft Windows family, Linux and other UNIX variants