

Heng Wang

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<https://hengcv.github.io/>

Summary

- 10+ years of combined research and engineering experience with deep expertise and focus on computer vision and machine learning.
- In-depth knowledge of image/video classification, action recognition/detection, object tracking, motion estimation, depth camera/data processing, person detection/segmentation, *etc.*
- Invented the most effective and widely used video features named “Dense Trajectories” for action recognition and detection, and won multiple international competitions and challenges.
- Strong publication record on top computer vision conferences/journals with over 6500 citations.

Professional Experience

- **Facebook AI** Menlo Park, CA
Staff Research Scientist April 2017 - Now
 - Drive the research efforts of video understanding. Invent next generation deep learning models for video classification.
 - Push the state-of-the-art video technology to different product applications. Coordinate with XFN teams and mentor junior researchers/engineers/interns.
- **Amazon Go** Seattle, WA
Research Scientist November 2014 - April 2017
 - Design and implement the “Just Walk Out” feature using a network of cameras for Amazon Go. Push the boundary of computer vision and machine learning systems to achieve human-level accuracy for automatically understanding human behavior during shopping.
 - Lead and collaborate with hardware/firmware/software engineers and product managers, and deliver results within limited time for the production system.
- **LEAR Team, INRIA Rhône-Alpes** Grenoble, France
Postdoc Researcher July 2012 - April 2014
 - **Advisor:** Cordelia Schmid
 - Improved the “dense trajectories” features to better handle camera motion and demonstrated the advantages of Fisher vector encoding. Published the 1st mostly cited paper of ICCV 2013.
 - Won two major video classification competitions: THUMOS action recognition challenge 2013 and TRECVID Multimedia Event Detection challenge 2013.
 - Code available at: http://lear.inrialpes.fr/people/wang/improved_trajectories, which is the best video features and generates the state of the art results for video analysis.
- **LEAR Team, INRIA Rhône-Alpes** Grenoble, France
Research Intern March - December 2010
 - **Advisor:** Cordelia Schmid
 - Invented the “dense trajectories” features and achieved groundbreaking results in action recognition. On the HMDB51 dataset, the accuracy was improved from 26.9% to 48.3%.
 - The original paper is the third mostly cited among all 438 papers of CVPR 2011.
 - Code available at: http://lear.inrialpes.fr/people/wang/dense_trajectories, which is among the most widely used video features for action recognition.

- **LEAR Team, INRIA Rhône-Alpes**

Research Intern

Grenoble, France

February - August 2009

- **Advisor:** Cordelia Schmid
- First extensive evaluation of different video feature detectors/descriptors and their combinations for action recognition.
- Proposed “dense sampling” instead of sparse feature detector and demonstrated its superior performance.
- Established a new state of the art and published a paper in BMVC 2009, which is highly considered as a standard benchmark for comparison and receiving over 1000 citations.

Education

- **Chinese Academy of Sciences**

Beijing, China

National Laboratory of Pattern Recognition

2006 - 2012

- **PhD** in Pattern Recognition and Intelligent Systems
- **Advisor:** Cheng-Lin Liu & Cordelia Schmid
- **Thesis:** Human Tracking and Action Recognition in Video

- **Harbin Institute of Technology**

Harbin, China

School of Electrical Engineering and Automation

2002 - 2006

- **BSc** in Electrical Engineering

Awards

Winner of action recognition, THUMOS workshop with ICCV 2013
Winner of TRECVID Multimedia Event Detection 2012 and 2013
PanDeng Scholarship, Chinese Academy of Sciences 2011
1st Prize, China Undergraduate Mathematical Contest in Modeling 2004

Professional Services

- Conference Reviewer: CVPR’13-19, ICCV’13-19, ECCV’14-18, BMVC’17, ICPR’12.
- Journal Reviewer: T-PAMI, IJCV, T-IP, CVIU, T-NNLS, PR, T-CSVT, IVC, PRL, SPL, *etc.*
- PhD Thesis Examiner & Research Grant Reviewer.

Selected Publications

Full publication list: <http://scholar.google.com/citations?user=ghmgyewAAAAJ&hl=en>

- D. Ghadiyaram, M. Feiszli, D. Tran, X. Yan, **H. Wang**, D. Mahajan. Large-scale Weakly-supervised Pre-training for Video Action Recognition. CVPR, 2019
- J. Ray, **H. Wang**, D. Tran, Y. Wang, M. Feiszli, L. Torresani, M. Paluri. Scenes-Objects-Actions: A Multi-Task, Multi-Label Video Dataset. ECCV, 2018.
- D. Tran, **H. Wang**, L. Torresani, J. Ray, Y. LeCun, M. Paluri. A Closer Look at Spatiotemporal Convolutions for Action Recognition. CVPR, 2018.
- **H. Wang**, D. Oneata, J. Verbeek, C. Schmid. A Robust and Efficient Video Representation for Action Recognition. IJCV, 2015.

- **H. Wang**, C. Schmid. Action Recognition with Improved Trajectories. ICCV, 2013. **1st mostly cited paper (1951 citations)**
- **H. Wang**, A. Kläser, C. Schmid, C.-L. Liu. Dense Trajectories and Motion Boundary Descriptors for Action Recognition. IJCV, 2013. **(1205 citations)**
- **H. Wang**, A. Kläser, C. Schmid, C.-L. Liu. Action Recognition by Dense Trajectories. CVPR, 2011. **3rd mostly cited paper (1908 citations)**
- **H. Wang**, M. M. Ullah, A. Kläser, I. Laptev, C. Schmid. Evaluation of Local Spatio-temporal Features for Action Recognition. BMVC, 2009. **1st mostly cited paper (1389 citations)**

Technical skills

- C/C++, Python, Linux(bash), OpenCV, Caffe/Caffe2, CUDA, Matlab, OpenMP, Lapack, *etc.*