Heng Wang

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Staff Research Scientist, Facebook AI, Menlo Park, CA

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** — Grenoble, France
  Research Intern — *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.*