

Heng Wang

Staff Research Scientist and Tech Lead, Facebook AI

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

Summary

- 12+ years of combined research and engineering experience with deep expertise in computer vision, deep learning, machine learning, *etc.*
- Lead and build teams, mentor and supervise researchers, engineers and interns; drive product applications for content understanding and content creation, solve real-world computer vision problems.
- Invented the most effective and widely used video features named “Dense Trajectories” for video understanding, and won multiple international competitions and challenges.
- Proven track record of publications on top computer vision conferences/journals with over 9500 citations.

Professional Experience

- **Facebook AI** Menlo Park, CA
Staff Research Scientist and Tech Lead *April 2017 - Now*
 - Drive the research efforts on video understanding across different organizations. Invent next generation deep learning technologies for video understanding. Make impact in both research community and industry.
 - Transfer the latest research results to different product applications, such as content understanding (FB, IG, Ads), integrity (detect objectionable content for Instagram and Facebook), infra (video search and retrieval), *etc.*
 - Tech lead projects, drive major technical bets and define future directions of video applications. Hire and build teams, mentor and supervise researchers and engineers.
 - Lead open source projects for video understanding, increase the adoption of deep learning frameworks such as Caffe2 and PyTorch.
- **Amazon Go** Seattle, WA
Research Scientist *November 2014 - April 2017*
 - Early member of the research team which develops complex computer vision systems that can replace human cashiers in a new form of grocery stores named “Amazon Go”.
 - 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 with limited time and resource.
- **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. 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 understanding.

- **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 popular HMDB51 dataset, the accuracy was improved from 26.9% to 48.3%.
 - The original paper is the **2nd** 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 baseline for comparison and receiving over 1500 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'13-21, ICCV'13-19, ECCV'14-20, 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: Semantic Scholar, Google Scholar.

- Y.-T. Hu, **H. Wang**, N. Ballas, K. Grauman, A. Schwing. Proposal based Video Completion. ECCV, 2020.
- **H. Wang**, D. Tran, L. Torresani, M. Feiszli. Video Modeling with Correlation Networks. CVPR, 2020.
- L. Zhu, L. Sevilla-Lara, D. Tran, M. Feiszli, Y. Yang, **H. Wang**. FASTER Recurrent Networks for Efficient Video Classification. AAAI, 2020.
- D. Tran, **H. Wang**, L. Torresani, M. Feiszli. Video Classification with Channel-Separated Convolutional Networks. ICCV, 2019.
- 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. **(702 citations)**
- **H. Wang**, D. Oneata, J. Verbeek, C. Schmid. A Robust and Efficient Video Representation for Action Recognition. IJCV, 2015. **(256 citations)**
- **H. Wang**, C. Schmid. Action Recognition with Improved Trajectories. ICCV, 2013. **1st mostly cited paper (2745 citations)**
- **H. Wang**, A. Kläser, C. Schmid, C.-L. Liu. Dense Trajectories and Motion Boundary Descriptors for Action Recognition. IJCV, 2013. **(1537 citations)**
- **H. Wang**, A. Kläser, C. Schmid, C.-L. Liu. Action Recognition by Dense Trajectories. CVPR, 2011. **2nd mostly cited paper (2351 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 (1585 citations)**

Technical skills

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