KEYNOTE TALK

Wednesday, December 14, 2016

8:30 AM – 9:30 AM / (Ballrooms 313 & 316)

ISVC 2016: 12th International Symposium on Visual Computing

Learning representations from unlabeled video

Kristen Grauman

University of Texas at Austin

Abstract

The status quo in visual recognition is to learn from batches of unrelated Web photos labeled by human annotators. Yet cognitive science tells us that perception develops in the context of acting and moving in the world---and without intensive supervision. How can unlabeled video augment computational visual learning? I'll describe our recent work exploring how a system can learn effective representations by watching unlabeled video. Fist we consider how the ego-motion signals accompanying a video provide a valuable cue during learning, allowing the system to internalize the link between "how I move" and "what I see". Next, we explore how the temporal coherence of video permits new forms of invariant feature learning, whether by capturing how object-centric regions evolve over time or by representing higher order consistency in visual changes. Incorporating these ideas into various recognition tasks, we demonstrate the power in learning from ongoing, unlabeled visual observations---even overtaking traditional heavily supervised approaches in some cases. Finally, we examine how simply having seen unlabeled human-taken videos, a system can learn to mimic human videographer tendencies, automatically creating normal field of view video out of unedited 360 degree panoramas.

This talk describes work done with Ruohan Gao, Dinesh Jayaraman, and Yu-Chuan Su at UT Austin.

Speaker Bio-Sketch: Kristen Grauman is an Associate Professor in the Department of Computer Science at the University of Texas at Austin. Her research in computer vision and machine learning focuses on visual search and object recognition. Before joining UT-Austin in 2007, she received her Ph.D. in the EECS department at MIT, in the Computer Science and Artificial Intelligence Laboratory. She is an Alfred P. Sloan Research Fellow and Microsoft Research New Faculty Fellow, a recipient of NSF CAREER and ONR Young Investigator awards, the Regents' Outstanding Teaching Award from the University of Texas System in 2012, the PAMI Young Researcher Award in 2013, the 2013 Computers and Thought Award from the International Joint Conference on Artificial Intelligence, and a Presidential Early Career Award for Scientists and Engineers (PECASE) in 2013. She and her collaborators were recognized with the CVPR Best Student Paper Award in 2008 for their work on hashing algorithms for large-scale image retrieval, and the Marr Best Paper Prize at ICCV in 2011 for their work on modeling relative visual attributes. She serves or has served on the Editorial Board for the International Journal of Computer Vision (IJCV), as an Associate Editor in Chief for the Transactions on Pattern Analysis and Machine Intelligence (TPAMI), and as a Program Chair of CVPR 2015 in Boston.