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Recognizing Human Actions in Video

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Abstract:

We propose a graph theoretic technique for recognizing actions at a distance by modeling the visual senses associated with human poses. Identifying the intended meaning of poses is a challenging task because of their variability and such variations in poses lead to visual sense ambiguity. Our methodology follows a bag-of-words approach. Here "word" refers to the pose descriptor of the human figure corresponding to a single video frame and a "document" corresponds to the entire video of a particular action. From a large vocabulary of poses we prune out ambiguous poses and extract key poses for each action type in a supervised fashion using centrality measure of graph connectivity. The number of key poses per action is determined by setting a "meaningful" bound on the centrality measure. We evaluate our methodology on four standard activity recognition datasets and the results clearly demonstrate the superiority of our approach when compared to the present states-of-the art.

Biography:

Prof. Dipti Prasad Mukherjee is the Professor and Head of the Electronics and Communication Sciences Unit, Indian Statistical Institute, Kolkata. He completed his PhD from Indian Statistical Institute (1996), MS from University of Saskatchewan, Canada (1989), and BE from Jadavpur University, Kolkata (1985). His primary research interest is in Computer Vision, Image Processing and Computer Graphics. He has written two books on Computer Graphics, edited four books and written more than ninety peer-reviewed research papers on vision, image processing and graphics. He had held visiting faculty positions at the Oklahoma State University, University of Virginia and Alcorn State University, USA and the University of Alberta, Canada. Prior to this, Dr. Mukherjee is the recipient of the pre-doctoral UNDP fellowship at the Robotics Research Group, University of Oxford, U.K., and the UNESCO-CIMPA fellowship to INRIA, France and to ICTP Italy. In 2010, he has received Japan Society of Promotion of Science Invitation fellowship to the Department of Radiology, Graduate School of Medicine, Osaka University, Japan. He is the senior member of IEEE and the Computer Society of India. He had served on the Editorial Board of the IEEE SIGNAL PROCESSING LETTERS and currently serving in the editorial board of ISRN Machine Vision journal.