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Efficient Human Motion Detection Feature Set by Using Local Phase Quantization Method

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Abstract : Human Motion detection is a challenging task due to a number of factors including variable appearance, posture and a wide range of illumination conditions and background. So, the first need of such a model is a reliable feature set that can discriminate between a human and a non-human form with a fair amount of confidence even under difficult conditions. By having richer representations, the classification task becomes easier and improved results can be achieved. The Aim of this paper is to investigate the reliable and accurate human motion detection models that are able to detect the human motions accurately under varying illumination levels and backgrounds. Different sets of features are tried and tested including Histogram of Oriented Gradients (HOG), Deformable Parts Model (DPM), Local Decorrelated Channel Feature (LDCF) and Aggregate Channel Feature (ACF). However, we propose an efficient and reliable human motion detection approach by combining Histogram of oriented gradients (HOG) and local phase quantization (LPQ) as the feature set, and implementing search pruning algorithm based on optical flow to reduce the number of false positive. Experimental results show the effectiveness of combining local phase quantization descriptor and the histogram of gradient to perform perfectly well for a large range of illumination conditions and backgrounds than the state-of-the-art human detectors. Areaunder th ROC Curve (AUC) of the proposed method achieved 0.781 for UCF dataset and 0.826 for CDW dataset which indicates that it performs comparably better than HOG, DPM, LDCF and ACF methods.

Keywords : human motion detection, histograms of oriented gradient, local phase quantization, local phase quantization
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