Histogram of Accumulated Changing Gradient Orientation (HACGO) for Saliency Navigated Action Recognition

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Action recognition has been an active research area in computer vision community during the recent years. However, it is still a challenging task due to the difficulties mainly resulted from the background clutter, illumination changes, large intraclass variation and noise. In this paper, we aim to develop an action recognition approach by navigating focus of attention (action region) with saliency detection and introducing a feature descriptor, namely Histogram of Accumulated Changing Gradient Orientation (HACGO). We firstly detect saliency in each video frame by computing pattern and color distinctness to localize action region. Then, we extract appearance and motion features using proposed HACGO, and existing HOG and HOF feature descriptors. Finally, a multi-class SVM classifier is applied to recognize different actions. The experiments were conducted on the standard UCF Sports action dataset. As experimental results, our action recognition approach achieved high recognition accuracy with a new combination of feature descriptors.