

WAVELET DECOMPOSITION BASED MOVING OBJECT DETECTION TO OPTIMISE TIME PERFORMANCE ANALYSIS

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Abstract

Moving object detection and tracking is one of the most important subjects in modern information acquisition systems for dynamic scenes. It is very important topic and has various applications in surveillance systems, video compression, robot technology etc.

In this paper, for detection and tracking of moving objects two algorithms are presented and tested. First algorithm is based upon wavelet decomposition-dispersion tracking (wd) and second algorithm is based upon wavelet decomposition-centroid tracking (wc). In wavelet transform background frame and current frames are resolved into their horizontal, vertical and diagonal moments and then these are subtracted respectively. Objects in difference images are extracted by using mountain gap method. Location of the moving objects are obtained by performing component connected analysis and morphological processing. In the first algorithm, dispersion calculation is performed to track moving object. In the second algorithm centroid calculation is used to track the moving object. These two algorithms are compared based upon average processing time per frame.

These algorithms are tested for different image sequences. The results are presented in qualitative and quantitative forms in terms of Detection Rate (DR) and False Alarm Rate (FAR). Processing time plays very important role in video processing. Therefore, average processing time per frame in millisecond is given for dispersion tracking and centroid tracking. The purpose of using centroid tracking is to optimise time performance analysis. Algorithms are also tested in noisy and variations in illumination conditions.

Keywords: moving object detection, Component Connectivity, Dispersion, Centroid, Tracking, Processing time, Detection Rate, False Alarm Rate.