

A Real-Time Moving Object Detection and Tracking Scheme and Its Implementation for Video Surveillance System

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Abstract : Detection and tracking of moving objects are very important in many application contexts such as detection and recognition of people, visual surveillance and automatic generation of video effect and so on. However, the task of detecting a real shape of an object in motion becomes tricky due to various challenges like dynamic scene changes, presence of shadow, and illumination variations due to light switch. For such systems, once the moving object is detected, tracking is also a crucial step for those applications that used in military defense, video surveillance, human computer interaction, and medical diagnostics as well as in commercial fields such as video games. In this paper, an object presents in dynamic background is detected using adaptive mixture of Gaussian based analysis of the video sequences. Then the detected moving object is tracked using the region based moving object tracking and inter-frame differential mechanisms to address the partial overlapping and occlusion problems. Firstly, the detection algorithm effectively detects and extracts the moving object target by enhancing and post processing morphological operations. Secondly, the extracted object uses region based moving object tracking and inter-frame difference to improve the tracking speed of real-time moving objects in different video frames. Finally, the plotting method was applied to detect the moving objects effectively and describes the object's motion being tracked. The experiment has been performed on image sequences acquired both indoor and outdoor environments and one stationary and web camera has been used.

Keywords : background modeling, Gaussian mixture model, inter-frame difference, object detection and tracking, video surveillance

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