

Motion-Based Detection and Tracking of Multiple Pedestrians

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Abstract : Tracking of moving people has gained a matter of great importance due to rapid technological advancements in the field of computer vision. The objective of this study is to design a motion based detection and tracking multiple walking pedestrians randomly in different directions. In our proposed method, Gaussian mixture model (GMM) is used to determine moving persons in image sequences. It reacts to changes that take place in the scene like different illumination; moving objects start and stop often, etc. Background noise in the scene is eliminated through applying morphological operations and the motions of tracked people which is determined by using the Kalman filter. The Kalman filter is applied to predict the tracked location in each frame and to determine the likelihood of each detection. We used a benchmark data set for the evaluation based on a side wall stationary camera. The actual scenes from the data set are taken on a street including up to eight people in front of the camera in different two scenes, the duration is 53 and 35 seconds, respectively. In the case of walking pedestrians in close proximity, the proposed method has achieved the detection ratio of 87%, and the tracking ratio is 77 % successfully. When they are deferred from each other, the detection ratio is increased to 90% and the tracking ratio is also increased to 79%.

Keywords : automatic detection, tracking, pedestrians, counting

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