

## Automatic Motion Trajectory Analysis for Dual Human Interaction Using Video Sequences

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**Abstract :** Advance in techniques of image and video processing has enabled the development of intelligent video surveillance systems. This study was aimed to automatically detect moving human objects and to analyze events of dual human interaction in a surveillance scene. Our system was developed in four major steps: image preprocessing, human object detection, human object tracking, and motion trajectory analysis. The adaptive background subtraction and image processing techniques were used to detect and track moving human objects. To solve the occlusion problem during the interaction, the Kalman filter was used to retain a complete trajectory for each human object. Finally, the motion trajectory analysis was developed to distinguish between the interaction and non-interaction events based on derivatives of trajectories related to the speed of the moving objects. Using a database of 60 video sequences, our system could achieve the classification accuracy of 80% in interaction events and 95% in non-interaction events, respectively. In summary, we have explored the idea to investigate a system for the automatic classification of events for interaction and non-interaction events using surveillance cameras. Ultimately, this system could be incorporated in an intelligent surveillance system for the detection and/or classification of abnormal or criminal events (e.g., theft, snatch, fighting, etc.).

**Keywords :** motion detection, motion tracking, trajectory analysis, video surveillance

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