Abstract

Object tracking in a video sequence is a challenging problem. The difficulties in the object tracking arise due to its motion, shape, size, and speed. In this paper, a new method has been introduced for object tracking. Generally, the tracker needs an initialization, often done manually or by object detection, but in the present approach, there is no need to initialize the tracker. A video can be represented as 3D data cuboid having spatial (X - Y axis) and temporal information (T axis). This cuboid is can be represented as continuous Y number of XT frames. For a video having a stationary background, the horizontal lines in XT frames are due to static scene. The inclined lines in XT frames are due to linear moving objects with constant speed. Thus, the information containing object motion in XY frames correspond to inclined line in XT frames. Depending upon the size of the object, these inclined lines can be thin or thick. For small and large objects, it will be thin and thick respectively. Hough transform-based line detection algorithm is used to extract these inclined lines. Binary edge map of XT frame is obtained by Canny edge detection algorithm which is used by Hough transform. Two nearby and parallel lines appear due to the large object. The morphological operations are used to combine
these lines into a single thick line. These lines correspond to motion due to a single object. If the object is not moving with constant speed, there will be curve in XT frame due to object motion. A curve is set of consecutive line. Using Hough transform based line detection algorithm, curve trajectory can be trajectory, which correspond to the object motion in XY frame.

References


Index Terms

Computer Science
Pattern Recognition

Keywords

Canny edge detection, Hough transform, morphological operation, erosion and dilation