Abstract

Tracking moving objects in a video is of critical importance in various fields such as traffic monitoring, video surveillance, human motion capture, etc. However, tracking multiple objects in a video is very challenging. To meet that, authors proposed a new adaptive technique for object localization through local and global appearance of target. Local layer concentrates on the target’s geometric deformation, i.e., the target structure is updated through adding and removing the local patches. The deformation information is constrained through the global layer, which concentrates on the shape, appearance, and color. The deformation information is passed from local to global layer through particle filter initialization and Hidden Markov Model (HMM). Particle filter is used to detect the local layer patches, and the sequence of deformation information is stored using HMM at global layer. This enhancement to the global layer improves multiple objects tracking efficiency. The efficiency of the proposed technique is evaluated through experimenting with a video containing multiple moving objects. Result analysis shows that the proposed method efficiently tracks multiple moving objects in the video.

**Index Terms**

Computer Science  
Pattern Recognition
Keywords
Multiple object tracking  Local layer  global layer  particle filter  HMM