Overlapped vehicle tracking via enhancement of particle filter with adaptive resampling algorithm

Abstract

Traffic surveillance and on-road security have elevated the demand of machine vision aided traffic control system. Through the modern video camera technology, vehicle tracking has become a vital approach to assist the on-road traffic systems. In the past, many tracking methods have been developed based on the detail and information extracted from the captured vehicle. However, conventional tracking system need to be improved since the background noises and sudden appear objects will increase the difficulties of continuously tracking the target vehicle. Hence, a particle filter algorithm with adaptive resampling approach has been proposed to overcome the vehicle occlusion problems. In addition, the proposed resampling approach can also be used to solve the common particle degeneracy problem. Experimental results show that the enhanced particle filter equipped with adaptive resampling algorithm is significantly improving the accuracy of the tracking process without compromising the processing time.