Adapting MCMC with CUSUM path plot for overlapped vehicle tracking

Abstract

Traffic surveillance using video sensors has been essential over the recent years and it is capable of obtaining wide range of vehicle information. However tracking overlapped vehicles still remain as a challenging task due to the involvement of high dimensional calculation. Conventional fixed sample size Markov Chain Monte Carlo (MCMC) will encounter tracking error if the sample size is insufficient and will be computationally expensive if the sample size is too large. Therefore cumulative sum (CUSUM) path plot is introduced to aid the difficulties in determining the sample size of MCMC. The adaptive sample size of MCMC has shown significant tracking accuracy especially when the vehicle is overlapped. Furthermore, implementation of observation likelihood by fusing colour and edge distance has further enhanced the tracking performances. Experimental result shows that CUSUM path plot algorithm has overcome the limitation of fixed sample size MCMC with better tracking accuracy and lesser computational time.