

Abstract

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A Data Association Approach for Multitarget Tracking Based on a Hidden Markov Model

When tracking multiple targets, the task of determining which measurement belongs to each target is a challenging one. There are many data association techniques to solve this challenging task in multitarget tracking systems. In most previous studies, there is a severe tradeoff between computational complexity and tracking performance. In this paper, a new data association approach, based on a Hidden Markov Model (HMM), is proposed. The proposed association approach utilizes the HMM to model the state space and capture the transition probabilities, through training, among the states of the target. The proposed approach has the advantage of a balance between computational complexity and tracking performance, thus it achieves higher performance with a lower computational complexity compared to some association approaches reported in the literature. Tracking performance of the proposed association approach is evaluated in some examples of multitarget tracking systems. The results show that the proposed association approach outperforms the nearest neighbor standard filter association technique.