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Sensitive Analysis of Observation Model for Human Tracking Using a Stochastic Process

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Abstract. This paper aims at obtaining basic knowledge about characteristics of observation models for human tracking method as a stochastic process. As human tracking in actual cases are complicated, we cannot always use the same observation models for every situation. Thus in most cases observation models are set empirically so far. In order to achieve an efficient choice of models and parameters, understanding some advantages and disadvantages of such models regarding to observation conditions is important. In this paper we conduct a sensitive analysis on some types of observation models. In particular, we obtain both colour and range information at a railway station. We prepare six predictive distributions as well as six models and parameters for both colour and range observation models. We calculate posterior distributions of each pattern, namely 36 patterns for both colour and range models. As a sensitive analysis we compare a value of a ground truth and an expected value of posteriors. We also compare variances of predictive and posterior distributions. Through this experimental results, we confirm our analysis method is efficient to obtain information about observation models. In fact, all models analysed are good in whole. One suggestive result is that colour models can deal with a predictive error in mean values, while range models in variances. Another is that under occlusions range models show a good performance.

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