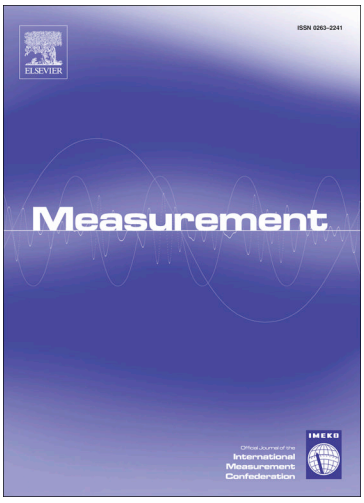

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An Adaptive Algorithm for Target Recognition using Gaussian Mixture Models

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Abstract

Target detection and recognition are widely used in civilian and military fields to identify humans, vehicles and weapons hidden in foliage. To adapt to changes in the forest environment and weather and to reduce unnecessary repeated training, this paper investigates the impact of weather on target recognition and classification based on ultra-wideband (UWB) signals. We propose a new method, called the Gaussian mixture model (GMM), to model targets in the presence of different weather conditions. Traditional statistical methodology is used for feature extraction, and GMM modelling is used to model the targets under different weather backgrounds. The likelihood ratio is calculated to obtain the corresponding target type, and achieve object identification and classification. This paper concludes with a comparison of the improved support vector machine (SVM) methods proposed in other studies in the literature. The experimental results demonstrate that the proposed algorithm based on GMM is effective for target detection under a variety of weather conditions.

Keywords: `Ultra wideband`, Target detection, Gaussian mixture models, LBG algorithm

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