

短文与研究通讯

基于属性测度的综合识别系统误差传递分析

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摘要:

战场情况的愈趋复杂,增加了识别过程的不确定因素,降低了识别结果的稳定性。基于多传感器信息融合的综合识别方法在一定程度上降低了识别过程中的不确定性,但由于传感器自身性能的限制,获取的目标信息具有一定的偏差,进而无法获取精确的识别结果。本文在属性测度理论以及对综合识别系统中误差来源分析的基础上,建立了综合识别过程中的误差传递模型,从定量的角度刻画了传感器误差对识别结果影响的大小。实例分析展示了目标识别方法在综合识别中的应用以及综合识别中误差从特征层到决策层的传递过程,结果证明了该误差传递模型的有效性。本文的研究对综合识别中的传感器误差控制和传感器选择,乃至对整个综合识别系统的优化都具有重要的指导意义。

关键词: 综合识别 多传感器 属性测度 误差估计 传递模型

Attribute measure theory based error propagation analyses in integrated identification system

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Abstract:

With the increasingly complex battlefield situations, uncertain factors in the identification process are increasing and the stability of the identification results consequently decreases. To overcome this drawback, multi-sensor data fusion based integrated identification has been proposed during the identification process. However, the restriction of the performance of the sensors causes a certain bias of the acquired target information; it is therefore difficult to obtain accurate identification results. In this paper, we propose an error propagation model for the integrated identification process based on the attribute measure theory and the analysis of error sources in integrated identification system. The new model is designed to characterize the impact of data bias on identification results quantitatively. Numerical experiments are given to describe not only the application of the target recognition method in integrated identification, but also the error propagation process from the feature level to decision-making. The effectiveness of the proposed model is demonstrated as well. This study could be a guide for error controls and sensor selection in integrated identification; it will be also useful to optimize the integrated identification system.

Keywords: integrated identification multi-sensor attribute measure error estimation propagation model

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