

CHALLENGES OF MULTI-SENSOR DATA FUSION

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Abstract

A modern battlefield scenario comprises of dynamically varying EO and RF threats, which lead to huge amount of data load on the operator, which in turn makes his decision-making act, a really challenging task. With the increase in the volume of data available to an operator during any mission, there seems to be a real need for a mission computer which can efficiently combine these huge, real time data from various collocated or dispersed sensors to arrive at a near real time picture of the operational field for better situational awareness based on multi-sensor data fusion techniques. Multi-sensor data fusion seeks to combine information from multiple sensors and sources to achieve inferences that are not feasible from single sensor or source. The fusion of information from sensors with different characteristics enhances the understanding of our surroundings and provides the basis for planning, decision making and taking necessary and apt strategic actions. This paper is focused on multi-sensor data fusion for airborne surveillance system. This paper proposes a comprehensive review of the data fusion state of the art, exploring its benefits, challenging aspects, as well as existing models and architectures. Example of Airborne Early Warning and Control System provides an insight as how multi-sensor data fusion is conceptualized in achieving the goal of autonomous target detection and tracking, identification, classification, situation and threat assessment. In addition, few possible future directions of research in the field of sensor fusion are highlighted.