

## **An Improved Estimator Using Multiple Sensor Data Fusion for Radar Maneuvering Target Tracking Systems**

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### Abstract

An algorithm for tracking multiple maneuvering targets using multiple sensor data fusion is developed in this paper. In order to solve a complicated situation due to the multiple maneuvering tracking environment, a tracking filter and a multiple-sensor data-fusion algorithm are applied in this study. In addition, in order to solve the data association and target maneuvering situations, a computational logic, including 1-step conditional maximum likelihood and a variable structure model as an adaptive maneuvering compensator, is applied to solve both data association and target maneuvering problems simultaneously. The advantage of this approach is that the sensors can be installed in either fixed or moving systems, thereby improving the tracking accuracy and the reliability of the radar surveillance. In order to verify this approach, simulations of multi-target tracking problems are conducted. Computer simulation results indicate that this approach successfully tracks multiple targets and has good performance.

Key words: 1-step conditional maximum likelihood;  
Adaptive maneuvering compensator; Gating;  
Multiple sensor data fusion