

“A case study on the design of a clutter plotmap-based plot classification mechanism”, pp. 61-66

Piet van Genderen

Abstract – Many fielded state-of-the-art radars suffer from excessive false alarm rates, at least at times. Various mechanisms have been devised in order to improve the signal-to-clutter ratio in general, but control of false alarms remains to be an issue for the designers. This paper discusses the design of a post-detection mechanism that splits the total offer of plots into four classes, such that the tracking algorithm may utilize each of these classes in order to have control over the false track rate. The mechanism has been developed for maritime sea-surveillance radar having a logarithmic receiver and a sliding window video extractor. It is basically a plot map performing a two-dimensional feature based classification. The features exploited are the signal-to-noise ratio and the target extent. Also the local plot density and the distance from the radar are taken into account. The parameters in the algorithm are tuned based on a learning set from the radar operating in real life and tested using the same parameter values on a test set, also recorded during real life operation. The results suggest that a mechanism like proposed can be effective in controlling the false alarm rate, however sometimes at the expense of losing some detections of real targets.