

Tracking based on graph of pairs of plots

Frédéric Livernet, Aline Campillo-Navetti

Délégation Générale de l'Armement Techniques Navales (DGA TN)

Toulon, France

frederic.livernet@dga.defense.gouv.fr

aline.campillo@dga.defense.gouv.fr

Abstract: Within the framework of a joint technical research cooperation project between Brazil and France, this paper proposes a new type of situation awareness algorithm based on the theory of graphs of pairs of plots (cf. Radar conference IEEE Washington 2010: „Tracking based on graph theory applied to pairs of plots”) using Brazilian Navy Aircraft Carrier “São Paulo” as a sensor data platform for the experimental TSV (Tenue de Situation Veille : Situation awareness).

The advantage of this new technique is the possibility to test easily a great number of hypotheses of plots association without recursive filter (Kalman). Thanks to the graph which is able to process a considerable history of plots, it can handle the transitional areas of target ambiguity and unobservability recorded during trials on board “São Paulo” due to the diverse and extreme clutter environment found near the coast or littoral (high false alarm and detection holes).

This paper first describes the context and the issue pertaining to situation awareness within the transitional areas of ambiguity and unobservability of the sensors plots. Afterwards, we will introduce the basics of this new technique for situation awareness, then its advantages in comparison with classical solutions MHT and PHD. Finally, performance results visualizations based on both simulated and real data recorded on board São Paulo confirms the performances of this new situation awareness technique.