Graham Weinberg

Defence Science and Technology Group, Australia

Radar Detection Theory of Sliding Window Processes

Venue: Room S111, Engineering South, Adelaide, South Australia, Australia

Date: Thursday 17th August 2017
4:00pm - 5:00pm
Refreshments provided from 5:00pm
Level 5 common room, Ingkarni Wardli

Abstract

Sliding window decision rules are suboptimal non-coherent detectors designed to regulate the false alarm rate while introducing a loss relative to optimal Neyman-Pearson decision rules. In earlier low-resolution radars these detectors were very popular and during the 1960s were investigated extensively. However, with the systematic improvements in radar resolution such detectors became difficult to design so that they achieved the full constant false alarm rate (CFAR) property. This is primarily a result of the evolution in radar clutter models. This seminar will outline how the full CFAR property can be achieved in modern models for maritime radar backscattering. In particular, a general class of clutter models is identified for which a generic sliding window can be specified, such that it achieves the full CFAR property. This class of clutter models includes the exponential, Weibull, Pareto Type I and lognormal distributions.

Speaker

Graham V Weinberg was educated at the University of Melbourne, Australia, where he studied mathematical analysis and probability theory. After completing a joint Honours degree in these fields, he undertook a PhD in stochastic processes and applied probability. Completing his PhD in 1999 he subsequently moved to Adelaide, where he undertook a fellowship at the University of Adelaide in applied mathematics. This was followed by employment at DSTO (now DST Group), where he has spent his entire time examining radar detection issues for maritime surveillance radar.

Since 2015 he has served on the editorial board of IET Electronics Letters as an Associate Editor. During 2016 he wrote a book (Radar Detection Theory of Sliding Window Processes, CRC Press 2017) documenting his extensive research in the area of non-coherent CFAR.

All Welcome

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