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Seminar Notice

Date: Tuesday 20th October, 2009, 4:00-5:00p.m.
(tea & coffee from 3:45pm)

Location: G3, Electrical Engineering Building

Speaker: Dr Ahmed Pasha
School of Electrical Engineering and Telecommunications
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Title: The Probability Hypothesis Density Filter: Technical aspects and Application

Abstract:

Multi-target filtering is one of the most critical functions in many civilian and military applications. Some of these applications include air traffic control, financial econometrics, global positioning systems, air defence systems, ocean surveillance systems and ballistic missile defence. Tracking multiple targets involves jointly estimating the number of targets and their states at each time step in the presence of noise, clutter, uncertainties in target manoeuvres, data association, and detection. As such, the problem is extremely challenging in both theory and implementation. Traditional multi-target filtering techniques are computationally intractable under such a general setting. Although various approaches have been proposed, the first systematic treatment of Bayesian multi-target filtering is based on the random finite set (RFS) formalism. The RFS approach treats the finite sets of targets and observations at each time step as the multi-target state and multi-target observation respectively and is an elegant generalization of the single target Bayes filter. The Probability Hypothesis Density (PHD) filter which propagates the first moment of the multi-target posterior only called the intensity function circumvents the combinatorial computations that arise from data association while accommodating detection uncertainty, Poisson false alarms, target motion and time-varying number of targets. In this talk I will discuss a closed form solution to the PHD recursion, implementation issues, the generalization to the jump Markov system multi-target model and applications.

For further information, visit the website. :***http://scrg.ee.unsw.edu.au/*** .
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