



Seminar



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Beyond the PHD Filter: Advances in Random Set Approaches to Multi-Object Estimation

This presentation outlines the progress of research and the state of the art in multi-target tracking or multi-object estimation. The random finite set (RFS) or finite set statistics (FISST) paradigm is the latest development for characterizing systems with a stochastically time-varying number of objects that are observed with imperfect sensors. The RFS paradigm has become synonymous with the so-called PHD filter and its variants, and the RFS approach has attracted substantial interest from both the academic and defense community. We review the well-known PHD and CPHD filters and touch on approximate Multi-Bernoulli filters. We also present the state of the art in labeled RFS approaches. Labeled filtering is underpinned by the existence of a conjugate prior, which enables a closed form recursion for the Bayes multi-target filter and hence tractable implementations for detection, tracking and identification. Distributed estimation is also discussed. Applications from various fields including radar surveillance, biomedical imaging, computer vision, and sensor fusion will also be demonstrated throughout the presentation.

Thursday, April 16, 2015

10:00 AM

ECAE 199 (Onizuka Conference Room)

Biography:

Ba Tuong Vo is currently an Associate Professor with the Department of Electrical and Computer Engineering at Curtin University in Perth, Australia. He obtained Bachelor degrees in Science majoring in Applied Mathematics, Engineering majoring in Electrical and Electronic Engineering, and PhD with distinction all from The University of Western Australia. He has active research interests in multi-target tracking, Bayesian estimation, and statistical signal processing. He is a recipient of an Australian Research Council Fellowship and a co recipient the 2010 DSTO Australian Museum Eureka Prize for "Outstanding Contributions in Support of Defense or National Security".