



The Chinese University of Hong Kong Shun Hing Institute of Advanced Engineering



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IEEE Signal Processing Society Hong Kong Chapter



Distinguished Lecture Series 2013

Stochastic Geometry in Dynamic State Estimation

by

Professor Ba-Ngu Vo

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Computer Engineering
Curtin University
Australia**



Date: 19 November 2013, Tuesday

Time: 2:45 p.m. – 4:00 p.m.

Venue: Room 121, Ho Sin Hang Engineering Building, CUHK

Abstract

The last decade has witnessed exciting developments in multi-target state estimation with the introduction of stochastic geometry to the field. Stochastic geometry--the marriage between geometry and probability--is a mathematical discipline that deals with random spatial patterns. The history of stochastic geometry traces back to the problem of Buffon's needle and has long been used by statisticians in many diverse applications including astronomy, atomic physics, biology, sampling theory, stereology, etc. Since 2003, Mahler's seminal work on the random finite set approach to multi-target filtering, which culminated in the probability hypothesis density (PHD) filter, has continued to attract substantial interests from academia and industry alike. The PHD filters have been used in oil pipeline tracking by British Petroleum, ground target tracking in the September 2007 NATO 'Bold Avenger' defence exercise and the US space fence program by Lockheed Martin. This seminar presents an overview of the random finite set paradigm to dynamic state estimation and outlines recent developments beyond the PHD filters as well as applications in areas such as sensor scheduling, computer vision, and field robotics.

Biography of the Speaker

Ba-Ngu Vo received his Bachelor degrees jointly in Science and Electrical Engineering with first class honors in 1994, and PhD in 1997. He had held various research positions at various institutions including CUHK. In 2010, he joined the University of Western Australia as Winthrop Professor and Chair of Signal Processing. Currently he is Professor and Chair of Signals and Systems in the Department of Electrical and Computer Engineering at Curtin University. Prof. Vo is a recipient of the Australian Research Council's inaugural Future Fellowship and the 2010 Australian Museum Eureka Prize for Outstanding Science in support of Defense or National Security. He is an associate editor of the IEEE Transaction on Aerospace and Electronic System. He is best known as a pioneer in the random set approach to multi-object filtering. His research interests are signal processing, systems theory and stochastic geometry with emphasis on target tracking, space situational awareness, robotics and computer vision.

ALL ARE WELCOME

In case of questions, please contact Prof. Ken Ma at Tel: 3943 4350, E-mail: wkma@ee.edu.hk, or Ms Natalie Tsang at Tel: 3943 4351, E-mail: ltsang@shiae.cuhk.edu.hk

** Light refreshment will be served at 2:15 p.m. before the lecture **