



THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

Bayesian Nonparametric Classification and Applications

by

Professor Zhu Han
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Date : 12 Jan., 2012 (Thur.)
Time : 2:30-3:30pm
Venue : Room 1009, William M.W. Mong Engineering Building
The Chinese University of Hong Kong

Abstract

Classification based on Bayesian inference is an important topic of machine learning. Based on the observations, we can infer about the hidden information that we are interested. The hidden information can be the structure of the observations, the hidden processes created the observations or which cluster the observation belongs to. Classical methods normally assume the number of clusters is known, leading to difficulties in model selecting. The methods can be easily under fitting or over fitting. Nonparametric Bayesian Classification (NBC), on the other hand, does not assume any prior knowledge on the number of clusters or hidden processes. Instead, the number of clusters is assumed to be infinite and only a limited number of clusters are observed. As more data is observed, the number of clusters can vary. This advanced property overcomes the difficulties in the model selection task in classical approaches. The Infinite Gaussian Mixture Model (IGMM), an example of NBC will be addressed. Two possible applications will be also described, one is Masquerade and Sybil attack detection, and the other is Primary User Emulation attack detection. Simulation was implemented in USRP2 testbed showing performance results of the algorithm.

Biography

Zhu Han received the B.S. degree in electronic engineering from Tsinghua University, in 1997, and the M.S. and Ph.D. degrees in electrical engineering from the University of Maryland, College Park, in 1999 and 2003, respectively. From 2000 to 2002, he was an R&D Engineer of JDSU, Germantown, Maryland. From 2003 to 2006, he was a Research Associate at the University of Maryland. From 2006 to 2008, he was an assistant professor in Boise State University, Idaho. Currently, he is an Assistant Professor in Electrical and Computer Engineering Department at University of Houston, Texas. His research interests include wireless resource allocation and management, wireless communications and networking, game theory, wireless multimedia, and security. Dr. Han is an NSF CAREER award recipient 2010. Dr. Han has 2 best paper awards (ICC09 and Wiopt 09), and winner of Fred W. Ellersick Prize 2011.

**** ALL ARE WELCOME ****