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DEPARTMENT OF STATISTICS AND ACTUARIAL SCIENCE
THE UNIVERSITY OF HONG KONG

Departmental Seminar

Dr. Lei YU

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City University of Hong Kong
Hong Kong

will give a talk
entitled

APPROXIMATE INFERENCE USING SIMPLIFICATION OF GAUSSIAN MIXTURE MODELS

Abstract

Probabilistic modelling and Bayesian inference are principal tools which are widely used in machine learning. An assumption of simple probabilistic models can lead to tractable and efficient computation for inference, but usually it cannot fulfill the requirement of most cases of interest in real world applications. Monte Carlo sampling and variational approximation are the two mainstay approaches for approximate inference. MC sampling approximates the intractable probability distribution with samples, which can be accurate but time consuming. Variational approximation supposes an unknown variational distribution from a tractable family then determines it by solving an optimization problem, which is efficient but tedious mathematical derivation is required for different models. Considering that finite mixture models are universal approximators for any continuous probability density, we use Gaussian Mixture Models(GMMs) to approximate generic continuous likelihoods in Bayesian inference. We firstly proposed a novel density simplification algorithm that can well preserve the original mixture distribution by directly grouping the base probability densities. Then we show its wide application on recursive Bayesian filtering, KDE mixture reduction, belief propagation and robust Gaussian Process regression.

on

Thursday, June 13, 2019

(Refreshments will be served from 1:45 p.m. outside Room 301 Run Run Shaw Building)

2:00 p.m. – 3:00 p.m.

at

Room 301, Run Run Shaw Building

Visitors Please Note that the University has limited parking space. If you are driving please call the Department at 3917 2466 for parking arrangement.

All interested are welcome