

# Pattern Classification and Machine Learning

## FEN3202

### Discussion Agenda and Exercises for Lecture 12

Saikat Chatterjee

#### I. DISCUSSION AGENDA

1) Approximate Inference (**Chapter 10 of the text book**).

Discussion Points: Motivation, stochastic and deterministic approximations

Variational inference (section 10.1), equation 10.2-10.4

Factorized distributions (section 10.1.1), equation 10.5, mean field theory, equation 10.6 to 10.9, consistent solution of equation 10.9 (or distributions of latent variables).

2) More discussion (**Chapter 9 of compendium authored by Arne Leijon and Gustav Henter**).

Discussion Points: Motivation and goal

Assuptions for VI, Example: Gaussian mixture

Optimization formulation, factorized approximations

Comment on use of VI for Gaussian mixture (**Section 10.2 of the text book**).

EM - Special case of VI.