Mixture models

Schedule : Tue 9:00A - 11:45A, Dasan Hall of Economics 32420

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Course description: This course focuses on model-based clustering methods using finite mixture modeling. This course introduces theoretical aspects of mixture (or latent class) models, the EM algorithm as a computational tool, and some potential applications. Students learn descriptive features of general mixture models, mixture of exponential families, geometry of multinomial mixtures, latent class analysis, and algorithmic theory for the EM algorithm in mixture models.

Prerequisite: Mathematical Statistics, Statistical Computing

Required Text: No required textbook

Reference materials: Finite mixture models by Mclachlan & Peel
Mixture models: Theory Geometry and application by Lindsay

Course Plan (Tentative)

Week 1: Introduction to mixture models
Week 2: Descriptive feature
Week 3: EM algorithm: general theory
Week 4: Fitting mixture models I
Week 5: Fitting mixture models II
Week 6: Practical issues in mixture models
Week 7: Midterm

Week 8: Gaussian mixture models
Week 9: Multivariate mixtures I
Week 10: Multivariate mixtures II
Week 11: Latent class analysis
Week 12: Mixtures of regressions
Week 13: Mixtures of experts
Week 14: Nonparametric mixtures
Week 15: Final project