

# Syllabus

## Finite mixture models

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### Introduction

Motivations:

- flexible density;
- non parametric estimation of a mixing distribution;
- unsupervised classification.

### Maximum likelihood estimation

EM algorithm;

“Fuzzy” interpretation of EM;

ML estimation of a mixture of Gaussians.

### Mixture of linear regression models

Omitted variables;

Random effects;

Heterogeneity;

EM algorithm.

### Latent class analysis

Latent variables models;

Latent class models for binary variables.

### How to choose the number of components?

LR test;

Bootstrap;

Automatic selection criteria.

### Principal Stratification for casual inference

Model;

ML estimation;

Examples.

### References

Frangakis, C. E., Rubin, D. B. (2002). Principal stratification in causal inference. *Biometrics*, 58 21–29.

Frühwirth-Schnatter, S. (2006). *Finite Mixture and Markov Switching Models*. Springer, New York.

McLachlan, G.J., Peel, D. (2000). *Finite Mixture Models*. New York: Wiley.