

Bayesian Nonparametrics

PhD in Statistics, Bocconi University

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Course Description:

The course provides an overview of Bayesian nonparametric theory. First the key probabilistic concepts and tools are provided, then a historical account of the discipline and of its success stories is given. Attention is then focused on discrete nonparametric priors in the exchangeable framework and beyond, and the techniques used for deriving their distributional properties and sampling algorithms showcased.

Course Syllabus:

- Overview of the main concepts and tools of the theory of processes with independent increments with special focus on subordinators and increasing additive processes.
- Poisson random measures and completely random measures with examples.
- Review of the basic notions and history of Bayesian nonparametric inference including the definition and main properties of popular classes of nonparametric priors and their application areas.
- Discrete nonparametric priors as transformations of completely random measures and analysis of their marginal and conditional properties with emphasis on normalized completely random measures.
- Dependent nonparametric priors with additive, hierarchical and nested structures.

Exam:

Oral presentation