

Department of Decision Sciences

Statistics Seminar

Beta-Product Poisson-Dirichlet Processes

Roberto Casarin

Università Ca' Foscari di Venezia

Thursday, 7 June 2012

12:30pm Room 3-E4-SR03 Via Rontgen 1 Milano

Abstract

Time series data may exhibit clustering over time and, in a multiple time series context, the clustering behavior may differ across the series. This paper is motivated by the Bayesian non-parametric modeling of the dependence between the clustering structures and the distributions of different time series. We follow a Dirichlet process mixture approach and introduce a new class of multivariate dependent Dirichlet processes (DDP). The proposed DDP are represented in terms of vector of stick-breaking processes with dependent weights. The weights are beta random vectors that determine different and dependent clustering effects along the dimension of the DDP vector. We discuss some theoretical properties and provide an efficient Monte Carlo Markov Chain algorithm for posterior computation. The effectiveness of the method is illustrated with a simulation study and an application to the United States and the European Union industrial production indexes.