

A Bayesian Non-Parametric Dynamic AR Model for Multiple Time Series Analysis

Nieto-Barajas, L. E., & Quintana, F. A. (2016). A Bayesian Non-Parametric Dynamic AR Model for Multiple Time Series Analysis. *Journal of Time Series Analysis*, 37(5), 675-689. <10.1111/jtsa.12182> Accessed 18 Dec 2020.

Abstract

In this article, we propose a Bayesian non-parametric model for the analysis of multiple time series. We consider an autoregressive structure of order p for each of the series and borrow strength across the series by considering a common error population that is also evolving in time. The error populations (distributions) are assumed non-parametric whose law is based on a series of dependent Polya trees with zero median. This dependence is of order q and is achieved via a dependent beta process that links the branching probabilities of the trees. We study the prior properties and show how to obtain posterior inference. The model is tested under a simulation study and is illustrated with the analysis of the economic activity index of the 32 states of Mexico..