

On some mixture models for time series of counts

Hedibert Lopes¹

¹ INSPER

We propose several extensions of the integer-valued autoregressive model of McKenzie, Al-Osh and Alzaid. First, we specify a Poisson-Geometric mixture distribution on the process innovations to learn the level of overdispersion of the time series of counts. Second, we consider time-varying innovations which are modeled by means of an infinite mixture through a Dirichlet process. The clustering properties of the Dirichlet process allow us to learn a latent pattern of heterogeneity in the innovation rates. However, since the Dirichlet process typically induces a peaked distribution over the number of clusters, we also apply the Pitman-Yor process on the innovation distribution in order to robustify inference. As a result, the proposed Bayesian models outperform the original model in a time series of crime events in Pittsburgh. This is joint work with Helton Graziadei (USP) and Paulo C. Marques F. (Insper)