CONSTRUCTING AUTOREGRESSIVE MODELS USING MIXTURE COPULA TRANSITION DISTRIBUTIONS

G. Escarela[†1], R.H. Mena[2], A. Castillo-Morales[1]

[1] *Universidad Autónoma Metropolitana, Mexico City, Mexico*
[2] *IIMAS-UNAM, Mexico City, Mexico*

[†] E-mail: *ge@xanum.uam.mx*

We present an extension of a general parametric class of transitional models of order p. In these models the conditional distribution of the current observation given the present and past history is a mixture of conditional distributions, each of them corresponding to the current observation given each one of the p lagged observations. Such conditional distributions are constructed using bivariate copula models which allow for a rich range of dependence to represent non-Gaussian time series. Fixed and time varying covariates can be included in the models. Exact likelihoods can be calculated. Aspects of parameter estimation, regression and model diagnostics are considered. These models have the advantage of straightforward construction and estimation for the analysis of time series and more general longitudinal data. A poliomyelitis incidence data set is used to illustrate the methods; contrary to other researches' conclusions whose methods are mainly linear, we find significant evidence of a decreasing trend in polio infection after accounting for seasonality.