Continuous Time Stochastic Processes with Given Univariate Marginals

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Approaches for construction of stationary continuous-time Markov processes with given univariate margins, are presented, particularly for univariate margins appropriate for count and positive-valued data. The motivation is development of time series models for equally or unequally spaced non-normal time series data. The margins are in the generalized self-decomposable and generalized discrete self-decomposable classes. The processes can be constructed via random operators or stochastic differential equations; one class of operators extends the binomial thinning operator. Some details will be given for the special cases, such as the Poisson and negative binomial marginal distributions.

This research is part of the thesis work of my Ph.D. student, Rong Zhu.