

Almut Veraart, Imperial College London

Modelling multivariate serially correlated count data in continuous time

A new continuous-time framework for modelling serially correlated count and integer-valued data is introduced in a multivariate setting. The key modelling component is a multivariate integer-valued trawl process which is obtained by kernel smoothing of an integer-valued Levy basis. The key feature making trawl processes highly suitable for applications is the fact that their marginal distribution and their serial dependence can be modelled independently of each other. We demonstrate the flexibility of this new modelling paradigm, by presenting various ways of describing both serial and cross-sectional dependence. Suitable methods for statistical inference within the trawl framework will be presented and their performance will be assessed in detailed simulation studies. Finally, we apply the new methodology to high frequency financial data: Using limit order book data from LOBSTER, we show that a bivariate trawl process constitutes a convincing joint model for the number of order executions of visible and hidden orders during a trading day.