MICHIGAN STATE UNIVERSITY
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COLLOQUIUM

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Parametric Specification Tests for Non-linear Time Series Models

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Abstract

We consider testing parametric assumptions for drift and diffusion functions in discrete time diffusion processes. To this end, we compare the kernel density estimate of the marginal density of the process and a convolution-type density estimate. Interestingly, it can be shown that the latter estimate achieves the parametric root-n rate of convergence, thus substantially improving the traditional kernel density estimate whose rate of convergence is known to be slow. Based on the convolution-type density estimate, we construct a specification test that can be used for a wide class of non-linear time series models. The asymptotic distribution of the proposed test statistic is derived and its finite-sample performance is investigated through a simulation study. Our results confirm that the test achieves good empirical level and power in comparison to some existing tests. (This work is joint with W.B. Wu and T. Zhang)

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