



Operations Research Seminar

Goodness-of-Fit Testing for Time Series in the Frequency Domain

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15:00-16:00 in GL-118
Refreshment 14:45-15:00 in GL-239

We provide an overview of recent advances in goodness-of-fit (gof) testing for linear time series models. Classical gof procedures test model residuals for whiteness, and this can be viewed heuristically as a weighted measure of discrepancy between the model spectrum and the periodogram. Since gof statistics test for model adequacy, the null hypothesis is composite, and as a result it is extremely important to account for parameter uncertainty in the variance normalization; otherwise they become badly mis-sized. We review the basic framework found in McElroy and Holan (2008, JMVA), and its application within three separate contexts: testing between two specified models via multi-step ahead forecasting criteria; testing between two specified linear models via measuring the ratio of their spectra; and testing the gof of a given linear model with respect to a specified signal-noise decomposition. The first and third cases provide substantial improvements to existing gof statistics that fail to account for parameter uncertainty properly, the former case being the popular Diebold-Mariano forecasting diagnostic.
