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SEMINAR

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304 Whitehead Hall
Refreshments: 3:30 p.m.
Seminar: 4:00 p.m.

**WAVELET-BASED CONTROL CHARTS FOR
GENERAL MULTIVARIATE PROCESSES**

ABSTRACT

We start with a brief review of the wavelet transform. For a monitored process consisting of independent and identically distributed (i.i.d.) normal random vectors, Shewhart-type control charts are generally used to detect shifts in the mean of the multivariate process. We review these Shewhart-type charts as well as more recent wavelet-based Shewhart-type charts. We extend the current wavelet-based Shewhart-type charts, which can be used only under the i.i.d. normal assumption, so that correlated multivariate normal (Gaussian) processes are permitted. Furthermore, for general multivariate processes (with any distribution), we introduce a new control chart that is based on the wavelet transform and the distribution-free tabular CUSUM chart. Finally, we present experimental results comparing our new charts with other wavelet-based charts for a process with both normal and non-normal marginal distributions.