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THE GENERATION OF CONFIDENCE INTERVALS FOR STEADY STATE SIMULATIONS THROUGH THE APPLICATION OF SPECTRAL ANALYSIS

Peter D. Welch
IBM Watson Research Center
P. O. Box 218
Yorktown Heights, New York 10598

To generate a confidence interval on the steady state expectation of the output sequence from a simulation one must generate a "good" estimate of the variance of the sample mean. This is less than straight forward because, in general, such output sequences are serially correlated. However, the variance of the sample mean is very simply related to the spectral density of the sequence. For large sample sizes, it is approximately equal to the spectral density at zero frequency divided by the sample size. Although this relationship has been well known for many years and the subject of spectral estimation is a well developed one, the application of spectral estimation techniques to simulation confidence interval generation has a somewhat checkered history and may yet be surrounded by considerable confusion.

This talk will attempt to put recent work into perspective with regard to the history of spectral approaches, other approaches and the basic issues of confidence interval generation. Broader issues such as sequential testing and run length control will also be discussed. The talk will assume no knowledge of spectral analysis.