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In This Issue

LONG-RANGE DEPENDENCE

Correlations among observations taken in sequence not only may be present, they may fail to dampen exponentially fast (as they would for ARMA processes). Stochastic processes exhibiting this behavior include increments of self-similar processes and fractional ARIMA processes. Jan Beran reviews statistical inference in these settings, which is very different than in the independence or "short-memory" (e.g., ARMA model) cases. In their commentary, Arthur Dempster and Jing-Shiang Hwang use generated data to show how fractional Gaussian processes may behave counterintuitively and in a manner that makes estimation very difficult, but they note that with such data it may remain possible to make reasonably good predictions. Emanuel Parzen suggests that changepoint and CUSUM techniques may provide useful diagnostics, while Adrian Raftery notes the availability of software to compute maximum likelihood estimates in fractional ARIMA models. The final discussant, Richard Smith, calls into question the justification and practical effectiveness of a pair of estimators of the self-similarity parameter discussed by Beran.

CURRENT ISSUES IN CLINICAL TRIALS

In the context of investigating treatments for colon cancer and AIDS, Thomas Fleming discusses the difficulties in monitoring clinical trials. Fleming emphasizes the importance of an independent data monitoring committee with rigorously defined guidelines. He also points out the special concerns with active control trials—in which it is expected that the control and experimental treatments will be equally effective but that the experimental treatment might reduce unpleasant side effects—trials with multiple outcomes and trials relying on surrogate endpoint measures. The discussants, John Crowley and Stephanie Green, David DeMets, Susan Ellenberg, Vern Farewell and Richard Cook, Stephan Lagakos, and Thomas Louis, all support the use of data monitoring committees, and all are wary of surrogate endpoints. They add a variety of further observations, including mention of some differences between their own experiences and those of Fleming (Crowley and Green), the complexity of the decision-making tasks for the data monitoring committee (DeMets), the special case of AIDS trials (Ellenberg), methods for combined monitoring of efficacy and toxicity (Farewell and Cook), the need for further research in multiarm trials (Lagakos) and a formal expression of the information provided by a surrogate measure (Louis).

INFERENCE USING ITERATIVE SIMULATION

Much recent attention has been given to iterative simulation techniques that aim to produce observations from a posterior distribution. In their paper, Andrew Gelman and Donald Rubin argue that careful practitioners employing these simulation methods should use multiple sequences generated with dispersed starting values. In a companion paper, Charles Geyer counters that it is more efficient and equally practical to use a single sequence. These two papers, and nine comments on them, may not resolve the dispute, but they certainly deepen the discussion.

The discussants are Lu Cui, Martin Tanner, Debajyoti Sinha, and W. J. Hall, Alan Gelfand, Neal Madras, Nicholas Polson, Amy Racine-Poon, Adrian Raftery and Steven Lewis, Jeffrey Rosenthal, Bruce Schmeiser and Luke Tierney. Among the topics they touch on are the value of theoretical convergence results (Polson, Rosenthal), the theoretical justification for prefering a single sequence, possibly in a hybrid algorithm (Raftery and Lewis, Schmeiser, Tierney) and the difficulty in obtaining good initial values (Madras, Racine-Poon); additional suggestions concerning convergence diagnostics are also made (Cui et al., Gelfand, Raftery and Lewis); and it is pointed out that the problem may be too general to be solved reliably by a single algorithm (Madras).

CHURCHILL EISENHART

Before commencing in nineteen forty-six his long and distinguished career at the National Bureau of Standards, Churchill Eisenhart was a doctoral candidate at University College, London, at a time when Fisher, Neyman and Pearson were there, and he then taught for ten years at the University of Wisconsin in Madison. Eisenhart recounts his experiences in an interview conducted by Ingram Olkin, and describes several of the projects he worked on at the Bureau involving variability of bales of wool, the sizing of teenage girls' clothing, a dispute concerning automobile battery additives and the construction of statistical tables. In passing, Eisenhart also makes a variety of comments concerning work conducted at the Bureau on experimental design.

Robert E. Kass

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