

critical, but so it is in nonparametric methods in which statisticians are quite happy to consider parameter dependent reference sets. Here is our recipe for straight line regression, referring to Professor Wu's paper.

First set (on the computer) the value of β . Then *evaluate* the

$$z_i = y_i - x_i^T \beta.$$

Bootstrap the z_i values (keeping the x_i values fixed). Regress each bootstrap z_i^* set back on the x_i values to obtain a $\hat{\beta}^*$ value for each bootstrap. Smooth the set of $\hat{\beta}^*$ to obtain $\hat{f}(\hat{\beta}|\beta)$. Note that \hat{f} depends on the set value β . Put $\hat{\beta} = \hat{\beta}_0$ the value obtained from the original (unbootstrapped) z_i values and we have our generated likelihood $L(\beta)$. Here $\hat{\beta}$ plays the role of the statistic T .

REFERENCES

- DAVISON, A., HINKLEY, D. and SCHECHTMAN, E. (1986). Efficient bootstrap simulation. *Biometrika* **73**. To appear.
 NIEDERREITER, H. (1978). Quasi-Monte Carlo methods and pseudo-random numbers. *Bull. Amer. Math. Soc.* **84** 957–1041.
 TUKEY, J. W., BRILLINGER, D. R. and JONES, L. V. (1978). *The Management of Weather Resources* 2. Weather Modification Advisory Board, Statistical Task Force, U.S. GPO, Washington.

DEPARTMENT OF MATHEMATICS
 UNIVERSITY STATISTICAL LABORATORY
 CITY UNIVERSITY
 NORTHAMPTON SQUARE
 LONDON EC1V 0HB
 ENGLAND

DEPARTMENT OF MATHEMATICS
 UNIVERSITY OF BENIN
 PMB 1154, EKENWAN ROAD
 BENIN CITY
 NIGERIA

REJOINDER

C. F. J. WU

University of Wisconsin-Madison

The overwhelming response to the paper reflects great interest and perhaps confusion in the bootstrap and the jackknife. The contributions of the discussants make the discussion informative, valuable and diverse. Their comments, even though I do not always agree with them, help clarify certain points, suggest new ideas and results, and in some cases prompt me to study the issues more carefully. Most of these comments can be grouped into five broad categories. My reply will concentrate on the major points of interest in each category.

Among the new ideas and results to which my response will not be directed, let me mention: robustification of resampled values (*Beran*), two interesting applications from genetics (*Felsenstein* and *Mitchell-Olds*), examples of inconsistency of bootstrap estimators (*Olshen* and *Srivastava*), use of weighted jackknife in variance components model (*Rao and Prasad*), results on the