

simultaneously, with a linear device, on two waveforms whose signal components are in a known relationship (e.g., separately obtained position and velocity measurements) and which have different noise components; the purpose is to make an optimum extraction, in the mean-square sense, of either signal component. The author proceeds by assuming a generic form of filtering arrangement, which is labelled "optimum" without proof. But the optimum nature of this arrangement is immediately suspect, for neither it nor the resultant mean-square error depends in any way on the statistical characteristics of the signal components. It is in fact easy to construct examples in which better filters than the one given are apparent.

From Chapter 5, "Exponential-Cosine Autocorrelation Functions", one gets the impression that almost all practical random processes have autocorrelation functions which are of the form of an exponentially damped cosinusoid. This impression arises in part from the repetition, under the guise that they are different, of intrinsically identical cases in which this form does appear; and in part from misleading implications and assertions that certain autocorrelation functions which are in fact profoundly *not* of the exponential-cosine type are in essence really of this type.

Other cases which deprive the book of authority as a reference may be cited—for example, the misinterpretation in Chapter 10 of some of Rice's work on the zero-crossing problem—but the point, one feels, is already made.

Random Vibration: Notes for the MIT Special Summer Program. Edited by Stephen H. Crandall. 414 pp. The Technology Press of MIT, Cambridge, Mass., 1958. Paperbound \$10.00. *Reviewed by George Weiss, Weizmann Institute of Science.*

The theory of noise, as developed originally by Wiener, Kolmogoroff, Rice, and others for the study of the effects of random phenomena on the behavior of electrical networks, has more recently been applied in many other fields. It has become of crucial importance in the design of high-speed aircraft where it is necessary to understand the effects of vibration on fatigue characteristics. This monograph contains a set of notes for a summer program on random vibration held at the Massachusetts Institute of Technology for engineers already familiar with the linear theory of vibration. The first six papers contain a general introduction to the notion and description of stochastic processes and an excellent introductory article on the problem of fatigue in metals by F. McLintock. The remainder of the papers are devoted to problems which are of a more specific engineering nature. These include studies of the response of structures to random pressures, and the design of simulation equipment for testing such response. Although there are many problems of theoretical interest in these fields, they are mentioned only incidentally. Therefore these notes are likely to be of interest only to the engineering specialist.

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