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Book reviews

Nonlinear Systems: Processing of Random Signals—Classical Analysis, edited by A. H. Haddad, 1975; 411 pages. (*John Wiley & Sons Ltd*, £12·00).

This book is the tenth in the series of publications of Benchmark papers in Electrical Engineering and Computer Science. The editor, Professor Haddad, has done a good job in collecting together the papers which represent milestones in the development of the subject. Many of these papers appear in publications or house journals which are difficult to find in the normal technical library. Two or three of the early standard references from the pioneering work of Wiener and Rice in the late 1940's and early 50's have already been published in book form and are therefore not included in this collection.

The selection of papers to include from the vast range of published literature over the past twenty years or so is indeed a formidable task. Professor Haddad begins by defining the scope of this selection as being the classical analysis of the response of a nonlinear system to a random process. There is no general solution to the problem and so the papers consider the response to specific classes of random input and types of nonlinearity.

The first group of papers considers the various characteristics of processes in which the cross correlation between input and output satisfies relatively simple rules. This is followed by papers dealing with the output second order properties such as autocorrelation, spectral density and signal to noise ratio. The most general treatment of the response of nonlinear systems is the functional approach. However, since the results for the general case are limited, several papers are included to illustrate the results which can be obtained with special cases of functionals.

The 26 papers are grouped together under the following headings:
1. Representations of random processes applied to nonlinear systems
2. Output properties of zero memory nonlinear systems
3. Functionals with random inputs
4. Basic papers on output spectra of special non linearities
5. Bandpass nonlinear systems
6. Output distributions of Zadeh's class η_1 functionals.

At the beginning of each of these sections the editor gives a valuable two to three page introduction which links the papers together in context and shows the development of the basic ideas and techniques as given in the individual papers. In addition to these 26 papers an extensive bibliography lists over 120 papers which make major contributions to the subject.

This book will form a most valuable and lasting reference work for all who are concerned with the engineering applications of random process theory.

B. L. CLARKSON (Southampton)

OECD Informatics Studies—8 Organisation for Economic Co-operation and Development, 1975; 272 pages, (*OECD Publications*, £3·60).

This book is a report about the proceedings of a seminar on 'Applications of Computer/Telecommunications Systems' that was held on 13-15 November 1972. The aims of the seminar were to consider present and future applications of computers, and to examine the telecommunications requirements, the economic and technical feasibility, and the social impact of these applications. These aims were achieved by forming nine groups covering areas such as Finance, Banking, Insurance; Transportation; Education; etc. Rapporteurs for each group summarised and criticised the proceedings under various headings, examples of which are economic factors, organisational implications, social effects and international considerations. This approach has given a structured format to the report which helps to relate the work of each group to the theme of the symposium, and brings out the salient features of the papers that were presented.

As a result of the orderly approach to the work of the seminar, the book is also well organised and the information content is high, because the forward looking nature of much of the material makes a great deal of it still relevant, even though three years have elapsed since the symposium took place.

However, for the most part the seminar dealt only in broad terms with wide ranging issues so this book is primarily for the general reader requiring an overall view of the subject: the engineer or scientist seeking a detailed treatment is likely to be disappointed. Recomended as a book for the library, rather than the personal collection, this publication is a useful commentary on the way computers in association with telecommunications networks are permeating society and becoming an essential part of everyday life.

D. L. A. BARBER (Teddington)