6. Conclusions

The results achieved show that it is possible to design a link system to reliably detect a wide range of fault conditions in a hostile environment, and to do this with little sacrifice of speed of normal working.

Future work should be aimed at improving the self-detection facilities of system hardware, particularly where failures could affect the accuracy of transmitted data.

References

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Book reviews

Le Langage ALGOL W: Initiation aux Algorithmes, by J. S. Chion et E. F. Cleemann, 1973; 292 pages. (*Presses Universitaires de Grenoble*, 30F)

Of the many dialects of ALGOL 60 in use at present, ALGOL W has a considerable following partly because of the efficiency of its compiler, partly because of the useful set of debugging facilities provided but also because of the range of types of data structure which can be represented in the language. The availability of string handling operations, records and references has allowed the authors considerable flexibility in choosing exercises and examples. As a result this book goes considerably past the stage commonly reached in most introductory textbooks. Such topics as converting expressions to postfix notation, evaluating postfix expressions and the use of recursion in the description of trees are included in the text. Anyone working through this book would thus not only have a working knowledge of ALGOL, but would also acquire an understanding of some of the data structures which are essential in the theory of programming languages. The first chapter of the book, however, has a pragmatic flavour in describing the nature of algorithms, and this is followed by a detailed description of the language, with careful explanation of each feature. There is a useful set of problems at the end of the book, which illustrates many of the features of the language described in earlier chapters.

In summary, this book is strongly recommended as background reading for Computer Science undergraduates, and for inclusion in departmental libraries.

M. H. ROGERS (Bristol)

Theory of Linear and Non-Linear Programming, by S. Vajda, 1974; 118 pages. (*Longman*, £2·95)

This brief book (110 pages of text) may be briefly reviewed. Like everything Professor Vajda writes it is excellent of its kind. It is a book about mathematical programming written for mathematicians. It contains no account of applications and so is not a work for anyone intent on learning how to formulate problems in terms of programming and then get an answer.

Professor Vajda adopts a definition of mathematical programming which means minimising or maximising a function of several variables subject to inequality constraints. He excludes integer, geometric, dynamic and stochastic programming from consideration.

He begins with a succinct account of convex sets, then develops the theories of alternatives and of duality, discussing, inter alia, von Neumann's minimax theorem. There follows a chapter on linear and quadratic programming. Evidence, if needed, that this is a mathematician's book is provided in two throw-away footnotes 'this is the rationale underlying the Simplex method' and 'this is the basis of the primal-dual algorithm'.

For non-linear programming he has a chapter on theorems of sufficiency and theorems of necessity in which he carefully and with considerable skill selects the essential mathematics from the Kuhn-Tucker theory and its later developments. He concludes with a short chapter on duality in relation to non-linear programming.

The book is written with extreme economy of style—I doubt if there is a superfluous word. The amount of knowledge condensed into it is quite remarkable. I highly recommend it.

A. YOUNG (Coleraine)

Computer-Aided Information Systems Analysis and Design, edited by J. Bubenko Jr., B. Langefors, and A. Sølvberg, 1972; 207 pages. (*Lund: Studentlitteratur; Copenhagen: Akademisk Forlag; London: Auerbach*, £4·00)

Although this is a belated review of an English translation of the proceedings of a conference which took place in April 1971, the subject matter is still of interest.

The conference was of the Scandinavian Information Processing Projects (SCIP) which is made up of a collection of co-operating research groups working in the area of information systems design. The term 'computer aided design' is better known in the Engineering field but is applied in this case to the automation of the design of Information Systems. Several, but not a majority, of the papers in the book place emphasis on computer aids to design. The point that is being made is that an information system (database) can be used to control the process of designing information systems (databases). Langefors goes as far as defining a new word 'cad' for a 'system for computer aided design'. However it is the formalising of the multi-stage design process and the relational approach adopted by the project being referred to (CADIS) which is of greater interest than the automation. Other authors are more down to earth and present their systems in terms such as 'Computer Based Documentation System'.

The conference gave a good coverage to the principles, tools and even the politics involved in the design of information systems, with case studies included to balance the theoretical papers. If it were not for the time that has elapsed since the conference this book would be recommended reading for those considering the problems of database design and the development of data dictionary systems. However it must be expected that the projects involved in SCIP have continued and that later papers have been published.

J. S. KNOWLES (Aberdeen)

Short notice

A comprehensive catalogue of Software available in 1974 *for exchange among members of the* (*American*) *Joint User Group*, 1975; 806 pages (*Collier Macmillan*, £12·50)

Programs are listed by manufacturer user group and there is a comprehensive subject/category index of 5,180 items. The volume is available in the BCS Library.