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Book reviews

Diagnosis and Reliability of Digital Systems, by Melvin H. Breuer and Arthur D. Friedman, 1977; 308 pages. (Pitman, £13.95)

This book is based squarely on the classical view of digital fault analysis as a branch of boolean algebra dealing with well defined faults such as signals stuck-at-zero. Nevertheless the authors make a valiant attempt to widen the discussion by including frequent asides about the practical relevance (or irrelevance) of the theory they are expounding. Chapter 1 provides a good general introduction to the terminology. Chapters 2 and 3, respectively on test generation for combinatorial and sequential circuits, are sympathetically written with numerous examples to help the reader through the sections of algebra. Chapter 4 on logic level simulation is well laid out, providing useful general material on simulators in addition to describing their application to fault simulation. The final chapter, entitled 'Reliable design: theory and techniques', is perhaps the weakest though it introduces appropriate concepts such as triple modular redundancy and error correcting codes. Each chapter ends with a substantial list of useful references and some problems.

A disadvantage of this book is its minimal treatment of system engineering aspects such as choice of technology, minimising down-time, reconfiguration and recoverability. So although the book is a useful (if expensive) guide to the theory of digital testing it is rather slim in its relevance to practical computers.

SIMON LAVINGTON (Manchester)

Methods of Algorithmic Language Implementation, edited by A. Ershov and C. H. A. Koster, 1977; 351 pages. (Springer Verlag Lecture Notes in Computer Science, Vol. 47, DM 31; \$13.70)

Conference proceedings are rarely good reading. The quality of contributed papers is very variable, often being low with the odd notable exception. They serve a valuable purpose for the participants but otherwise are often of ephemeral value. *Methods of Algorithmic Language Implementation* is, however, a conference proceedings with a difference. It contains the English translations of 22 out of 33 papers presented at a symposium held between September 10-13, 1975 at Novosibirsk, USSR. The aim in publishing these proceedings is best stated by quoting from C. H. A. Koster's preface to the English Edition. 'It is hoped that these proceedings will allow insight in the work being done on compilers in the Soviet Union, and a view of the persons doing it, leading to responsible communication and collaboration between eastern and western scientists.'

Only time will tell whether this aim is achieved, but my own reaction, after reading a sample of the papers, was *not* to be encouraged to establish any contacts. Tyugu, in contrasting his own work ('A programming system with automatic program synthesis') with that of Manna and Waldinger claimed that his was 'purely practical' whilst that of Manna and Waldinger was 'theoretical'. In my view the reverse is much nearer the truth. Král's contribution ('Almost top-down analysis for generalised $LR(k)$ grammars') was difficult to read because of the poor English and I was also sceptical of both the value and the accuracy of its main result. Both Král's and Tyugu's contributions were formal, a feature which was prevalent in many of the papers.

The latter papers were the first I read because they were in areas with which I am familiar. Choosing the papers which looked well-

typed turned out to be a better strategy for finding good contributions! V. K. Sabelfeld's contribution ('Procedure Implementation in the Multi-Language Translator') described the optimisation of procedure calls in the BETA system, this being a combined implementation of PASCAL, PL1, ALGOL 68 and SIMULA 67. The BETA system would appear to be a prominent research area—apparently six papers concerning it were included in the original proceedings, but only three appear in the English translation. J. Borowiec's contribution was also noteworthy ('Pragmatics in a Compiler Production System'). I'm not a fan of compiler-compilers but if you are it might be worth a look.

The main impressions I got from reading seven of the contributions were (a) considerable interest in compiler-compilers, (b) large (over) emphasis on formalisation, and (c) great interest in and knowledge of current developments in the Western world. Koster, in his preface, echoes these points as well as adding a few more.

Finally—would I recommend my library to buy the proceedings? The answer is No. I'm quite happy with the thought that the BLLD possesses a copy which may be consulted by the few specialists who think it worthwhile.

R. C. BACKHOUSE (Edinburgh)

Pattern Recognition and Artificial Intelligence, edited by C. H. Chen, 1977; 621 pages. (Academic Press, £20.25)

It is now quite fashionable to collect together the majority of the papers presented at a conference in the form of a hardback book, thereby providing a convenient way of producing a 'proceedings' whilst offering an academically respectable medium for publishing the results of research and, consequently, encouraging contributors to the conference to take more trouble in preparing their presentations.

Pattern recognition and artificial intelligence are still regarded as fringe topics by many journal editors so that it is not always easy to find the best way to publish papers in these fields. The few specialist journals are overloaded and publication delays can be considerable.

Professor Chen's book comprises 28 papers originally presented in June 1976 at the joint workshop on pattern recognition and artificial intelligence in Hyannis, Massachusetts. The length of the volume is indicative of the substantial treatment given to the various topics included, papers being, on average, some 20-25 pages long. Many of the papers provide useful reviews as well as up-to-date accounts of the author's own work. In particular, K. S. Fu reviews tree languages and syntactic pattern recognition and H. K. Huang and R. S. Ledley survey six different applications of pictorial medical pattern recognition. N. Corby and L. A. Gerhardt present an interesting account of the development of a system for observing and measuring 'point of regard time histories' (eye tracks). B. L. Bullock presents results in his paper 'Finding structure in outdoor scenes' which seem to extend the methods developed in 'toy' situations in the laboratory into the realm of usefulness in handling real scenes.

This book, although expensive, is good value and should find its way on to the shelves of anyone interested in its joint subject area, always assuming that sums like £20.25 can be raised in these difficult times.

M. J. B. DUFF (London)