$AX(j)$ and $BX(j)$, with $AX(j) = f(t_j)$.

We tested FLIT again with our two previous test functions; we took $L = 20$ in order to have NSUM = 2000 for METHOD1, METHOD2, and FLIT. Tables 1 and 2 show the improvement from the right to the left. Again $N = 100$; only 20 points are printed.

To be sure of FLIT's efficiency, we tested the difficult case of a function $f(t)$ with an infinite number of discontinuities:

$f(t) = 2 \sum_{k=0}^{\infty} (-1)^k U(t - 2k)$, whose value is 2 for

$$2k \leqslant t \leqslant 2k + 1$$

and 0 for $2k + 1 \leqslant t \leqslant 2(k + 1)$. Here

$$F(s) = 2/s(1 + \exp(-2s)) .$$

We ran this test with $T = 20$, $aT = 5$, $L = 50$, NSUM = 5000, $N = 100$. The results are displayed in **Table 3**.

8. Conclusion

We wish to mention here the specific problem which brought us to develop FLIT; it might interest some electrical and electronical engineers.

We had to find the influence of various parameters upon the response of a circuit containing a coaxial cable. The Laplace expression for the voltage across the impedance loading this coaxial cable was:

$$V(s) = \left[\frac{C_o V_o Z_{(o,s)}}{1 + C_o s(L_o s + R_o + Z_{(o,s)})}\right] \times \left[\frac{Z}{Z_c \sinh \gamma l + Z \cosh \gamma l}\right]$$

with:

$$Z_{(0,s)} = Z_c \left(\frac{Z + Z_c \tanh \gamma l}{Z_c + Z \tanh \gamma l}\right)$$

$$\gamma = \sqrt{(R\sqrt{s} + L_s)(G + C_s)} \quad Z_c = \sqrt{\frac{R\sqrt{s} + L_s}{G + C_s}}$$

R, L, G, C:	cable constants.
l:	length of the cable.
Z:	load impedance.
V_0, L_0, R_0, C_0:	electrical parameters of the circuit; their influence upon the circuit response is investigated.

Whenever we decided to compare theory and experience, the computed voltage was found to be identical to what was observed on the scope.

A FORTRAN listing is available on request; the author would welcome the submission of any difficult case he has not thought of.

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Book review

Functional Analysis of Information Processing, by Grayce M. Booth, 1974; 269 pages. (*John Wiley*, £7·70.)

This book has to be judged in the context of the claims made for it in the preface and introductory chapter.

Its aim is to provide an aid to the information systems analyst, designer, or programmer in the analysis of complex computer systems. For this purpose a new approach is put forward—the approach of the structured, functional analysis of information processing. The functions referred to are all related to the processing machine, i.e. the computer, hardware and software. The approach is 'really a method of logically structuring the systems analysis and design process. It will also furnish (the designer) with a complete set of hardware and software functions which he can evaluate when designing an information processing system.'

In practice the author offers a six level scheme of hierarchically classifying a computer system, ranging from level I—the network level (two components: information processing, and network processing) to level VI—the level of device techniques.

Like most classification schemes it is often arbitrary and sometimes idiosyncratic. For example, the category 'simulation' (level VI) appearing in the level V category of 'other languages' puts simulation of one computer on another in the same class as simulation languages, and it is the only place in which emulation is described.

The rigid structure imposed by the six level classification system prohibits analysis where more than six levels may be appropriate. Thus the title operating systems much used in the text cannot be found a place in the classification, all operating system functions being separately defined under the level III—classification, 'software functions'.

More seriously, many functions important to the designer are not classified or may be missing altogether. No reference is made to different methods of file access organisation, such as index sequential, random algorithmic, lists, or inverted files. The level V entry—printers has no lower level components although a designer could well be concerned with further entries such as line printers, character printers, impact printers, non-impact printers and sub-classes of these.

The analysis provides descriptions of class components in various levels of detail but little in the way of quantitive information which could help the systems designer. Hence, it fails in its major objective.

It is to some extent redeemed by the clarity of the writing independent of the system of classification. Some of the descriptive pieces, as for example those relating to data management, and its component data description language and data manipulation language, are well written but not detailed enough for anything except a first appraisal. The main use of the book may be as a check-list of systems components for information systems designers.

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