The author uses processor to mean I/O channel controller which, of course, will be confusing to one encountering the title but not examining the article. No attempt is made to examine a genuine multiprocessor system.

Of course, the more modules and/or buses supplied the better the computer performs. However, the presentation is so fraught with assumptions it is difficult to determine the interrelationship between modules and buses.

The study is not a theoretical one but rather a simulation. Whenever a simulation is performed, the reader should be informed of just how this is done so that he can evaluate the results. Finally, some of the tables were in such fine print that even my myopia did not help me to read the print.

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C. ANALOG COMPUTATION AND SIMULATION


In analog computation there is a tendency not only to strive for the highest possible accuracy, but also often the criterion for accepting an analog scheme also requires minimizing the number of computer components and the duration of the problem preparation time. On the other hand, in analog or hybrid computation every sophistication intended to improve accuracy usually calls for more computer equipment, and every sophistication introduced to reduce computer equipment usually requires more time for problem preparation. Having this in mind, the method of Bessel function generation, discussed in Bingulac and Humo1 (Reference 5 in Hausner's paper), may be considered as the first degree of sophistication, since in developing this method the only criterion was to reduce the complexity of the analog computer scheme, thereby decreasing the number of computer components. Van Remorthe's method,2 however, represents the second degree of sophistication because a) it divides the whole range of the independent variable into two subintervals, and b) in the first subinterval it approximates the solution by a Taylor series. This of course improves the accuracy but on the other hand, the number of analog computer components increases.

Hausner's method may be considered as the third degree of sophistication since

a) for the Bessel functions of higher order, it divides the range of the independent variable into three subintervals,

b) in the first subinterval the Bessel functions have a zero value, while in the second subinterval, the Taylor series is approximated with a Chebyshev polynomial which is of a lower order than the corresponding Taylor series, and

c) in the third subinterval, the Bessel differential equation is solved with appropriate initial conditions which should be taken from tables of Bessel functions.

Computer results, using this method, show excellent accuracy for Bessel function generation.

In fact, this is an attempt to reduce the computer equipment required by Van Remorthe's method which, if applied to the general case of generating functions involving indeterminate quotients at the origin, increases the problem preparation time.

Obviously, there is a trade-off amongst accuracy, quantity of computer equipment, and the problem preparation time, which will determine the particular method used in given circumstances.

The fourth degree of sophistication, which may be visualized by the following, would consist in the dividing of the range of the independent variable into more (finite) subintervals, leading us eventually to hybrid computer generation of Bessel functions. For ultimate accuracy, it is recognized that these techniques could be extended to pure digital computation, with some expectation of running time savings over current digital methods.

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