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FOREWORD

This symposium is the fifth in a series of meetings sponsored by the IEEE Computer Society and dedicated to the advancement of the theory and applications of computer arithmetic. The first meeting was organized as a workshop by Richard Shively in Minneapolis, Minnesota in June 1969. A special issue of the IEEE Transactions on Computers (vol. C-19, 1970) including the major papers from the workshop was guest edited by Dr. Shively. The second symposium was held at College Park, Maryland in May 1972. Again, a special issue of the IEEE Transactions on Computers (vol. C-22, 1973), co-edited by Harvey Garner and Dan Atkins, was produced. The third symposium was held at Dallas, Texas, in November 1975. David Matula and T. R. N. Rao, the organizers of the third symposium, edited a special issue of IEEE Transactions on Computers (vol. C-24, 1977). The fourth symposium was held in Santa Monica, California and was organized by Al Avizienis and Milos Ercegovac.

Since the last symposium the field has seen the emergence of a carefully conceived proposal for an IEEE standard for binary floating point arithmetic. This proposed standard is the subject of several papers in the present symposium and the focus of a special tutorial to be held immediately following it. It is also exciting to note the move towards VLSI systems and specialized processors which give rise to new opportunities to exploit the potential advantage of non-standard number systems. These, together with innovations in computer architecture and device technology, may be required to meet the need for significant increases in computer processing power.

The success of the series of symposia is further evidenced by the steady growth of research in the field yielding forty one contributions to this fifth symposium. The contributions range from mathematical foundations to case studies and are divided into the following nine topic areas:

- (1) Non-Traditional Number Systems,
- (2) Design and Implementation of Arithmetic Processors,
- (3) On-Line Arithmetic,
- (4) Error Control and Error Analysis,
- (5) Function Evaluation,
- (6) Special Purpose Processors,
- (7) Case Studies, and
- (8) Schemes for Addition and Multiplication.

Eleven of the papers are from outside North America prompting us to suggest that the next symposium may be held outside North America.

It is a pleasure to express our thanks to the members of all the organizing committees for their valuable service and to the referees for their thorough and timely reviews. Thanks are also due to the IEEE Computer Society staff, the Duke University Department of Computer Science and the University of Michigan Department of Electrical and Computer Engineering for the essential support given to us during the preparations for this symposium.

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