Distributed Processing
Guest Editors’ Introduction

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This issue of Computer is based on two workshops in distributed processing held at Brown University August 17-19, 1976, and August 3-5, 1977. Sponsored by the Army Research Office, the National Science Foundation, and the Office of Naval Research, the workshops attempted to define what distributed processing means and to develop a taxonomy of distributed processing applications and techniques. Achievements to date and outstanding research problems were examined in an attempt to find either commonality of problems and solutions or substantial differences.

Time limitations prevented us from addressing the entire field. For example, we excluded economic and managerial issues, focusing instead on distinctive technological issues. Both workshops dealt primarily with the least routine, most unexplored research areas in distributed processing. These types of distributed processing may be characterized by the cooperation of multiple autonomous processors (and other resources) to execute a single job, typically a large-scale application program. Of interest, for example, was flexible, possibly even dynamic scheduling of resources, such as runtime binding of program and/or data modules to processors.

The first paper in this issue provides definitions, a trial taxonomy, and some observations. A summary of the sessions from both workshops follows. The issue concludes with three papers based on the workshops but solicited especially for this issue. These papers discuss a high-performance distributed architecture, distributed database issues, and network operating systems, respectively.

The summary of the sessions in this issue is based on transcripts provided during the workshops by teams of session recorders. The transcripts were revised through several editing cycles by the participants while the workshops were still in progress. The full 1976 transcripts have been published in Computer Architecture News in two parts, the first in Vol. 5, No. 5, December 1976, and the second in Vol. 5, No. 6, February 1977. The full 1977 transcripts have been published as Brown University Technical Report CS-32 and can be obtained from the Computer Society Repository (R77-373). An informal annotated bibliography covering 150 documents was made available to workshop participants and readers of Computer Architecture News.

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Andries van Dam is a professor of computer science and applied mathematics at Brown University, where he also directs the Interdisciplinary Program in Computer Science. He has been working in research in software engineering in general, computer graphics, text processing, mini- and microcomputers, and microprogramming in particular. His recent activity has concentrated on distributed processing between a large timeshared host computer and a multiprocessor intelligent satellite.

Van Dam received the BS degree from Swarthmore College in 1960 and the MS and PhD from the University of Pennsylvania in 1963 and 1966, respectively. A member of Sigma Xi, IEEE Computer Society, and ACM, he is editor of Computer Graphics and Image Processing, a member of the Editorial Advisory Board of Computers and Graphics, and a member of the Editorial Board of Encyclopedia of Computer Science.

John Stankovic is a research assistant working towards the PhD degree at Brown University. Prior to his graduate studies, he worked at Bell Labs in Whippany, New Jersey, primarily doing software design on the Safeguard antiballistic missile system.

Stankovic has earned two degrees from Brown University—a ScB in electrical engineering in 1970, and a ScM in computer science in 1976. A member of IEEE, ACM, and Sigma Xi, he served as the president of the student chapter of the ACM at Brown University for two years.