DESIGN AUTOMATION
Guest Editor’s Introduction

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The set of design tools and practices collectively known as “design automation” had its origin twenty years ago. The evolution of these practices as applied to the design of digital computers is nicely described by Preiss. Since its inception, this field has expanded to include not only computer design, but also such diverse items as office space planning, ship building, land use, textile design, and computer software/firmware.

The basic processes of design recording, clerical checking, simulation (modeling), standards enforcement, test process generation, and creation of manufacturing data have been adapted to many technologies. But by far the widest application of design automation is in the noncreative, “cookbook” type clerical tasks of design recording, checking, data reformatting, and information transfer.

However, even the great advances made in the processes of interconnection and placement are just beginning to match in elegance the abilities of humans in any particular design problem. The excellence of the program comes from the speed and reliability with which they operate, and the large problems they can handle.

Significant progress has been made in the area of simulation. Large networks of circuits can be examined at various levels of detail to provide design verification data for both the behavior and structure of the device being designed.

There has been a long standing interest in applying the formality of design automation procedures to the business of software generation. Early applications in this direction came with the processing of microprogram data. The first broad application of microprogramming came from hardware engineering environments, where designers had become used to design automation. Further, early technologies for control storage were read-only hardware devices which required formal manufacturing documentation and test data. The experience gained in processing

microprograms and the recent high level of interest in a more formal, controlled approach to software design have opened up new possibilities for design automation of software.

The papers selected for this issue of Computer originated from the proceedings of the 11th Design Automation meeting. The paper by Garroq et al presents a total system for management control of development projects. The paper by Harlow et al provides a look at a specific quality generating process which is aided by access to detailed design data. Finally, the paper by Woodyard demonstrates the diversity of areas of application for design automation techniques.

Special recognition is due J. Michael Galey for his editorial work in selecting, reviewing, and organizing the papers for this special issue.

This additional direction of emphasis is shown in the program put together for the Twelfth Design Automation Conference to be held in Boston, June 23-25, 1975 (see Calendar section in this issue of Computer). The sessions include a keynote address by Harlan Mills and tutorials on software engineering and heuristic programming.

For another interesting approach to this problem see “Feasibility Study of an Integrated Program for Aerospace Vehicle Design (IPAD)” by Dr. Ralph E. Miller, Jr., et al in the Proceedings of the 11th Design Automation Workshop, pp. 335-346.

Herbert M. Wall served as General Chairman of the 11th Design Automation Workshop. Currently he is a program manager in the Communication Systems Division of GTE Sylvania at Needham, Mass., where he directs a design engineering effort in support of weapon system survivability for the Air Force’s Minuteman Program. Earlier, he spent 10 years at IBM’s Data Processing Division working in systems engineering and marketing of engineering applications. While at IBM, he helped develop the ECAP system, one of the first widely used circuit simulation packages.

Wall received the BEE from the City College of CCNY (now CUNY), and the MBA from Northeastern University. His technical interests are in design automation practices and techniques.

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