Rapid progress is now being made in computer-aided design for VLSI.
Cover

The cover illustrates some of the progress we've made in VLSI design automation over the past decade. We are finally learning how to effectively describe VLSI layouts at representation levels higher than primitive rectangles and polygons. We're also making a great deal of progress in our ability to verify the correctness of these designs, whatever the method used to generate them. Several articles in this issue focus on recent progress made in design automation for VLSI. (Drawing instruments courtesy of the Oakland Museum History Department; CAD photo courtesy of Applicon Corporation; photography by Victor Budnik)

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LAMBDA is well into its second year of publication, and the acceptance and growth of the magazine are most encouraging. Please continue to forward any news or article suggestions you may have. We are always on the lookout for good material. In recognition of our readers' strong interest in design-automation tools and methodologies, this issue contains an unusual number of articles on this and related topics.

The article from Intel, describing the design-automation system developed for use in the design of the Intel 432 micromainframe, is especially valuable because of the hard data and design experience associated with these tools. In conjunction with this article, we introduce our first "center-fold" featuring color photographs of the first three chips in the 432 family. We thought that the detailed structure of these chips were an interesting lesson in chip design, and that the photos would also make suitable wall hangings. If you have suggestions for future center-folds, please let us know.

Larry Lopp takes a look at the design-automation challenge in general, and suggests a model for predicting how fast we must improve designer productivity over the next five years to keep up with fabrication technology. You may question his assumptions or his results, but, either way, we hope you find the article thought-provoking. If you have specific comments on, or criticisms of this or any article, please write to us.

Symbolic layout systems are gaining widespread attention from both commercial vendors and university researchers. John Williams, creator of the first dynamic symbolic layout system while a graduate student at M.I.T. in 1978, surveys the field for us and offers some insight into the differences between the various systems under development.

John Hennessy of Stanford University describes the system he has developed to aid the design, layout, programming, and simulation of programmable logic arrays (PLAs). There should be enough detail in the article to help you determine what features you may want to build into your own system.

To complete this special issue on CAD, we asked each of the principal IC-CAD vendors to submit a brief summary of its view of the IC-design problem. We think you will find these perspectives different and enlightening.

Getting away from design automation, Merrill Brooksby and his colleagues at Hewlett-Packard describe the techniques and advantages of reducing the turnaround time in an IC processing line. We have often spoken of the advantages of such a line to the designer, but shorter turnaround times are also advantageous to those running the line.

Darryl Schofield has written an interesting article on the stumbling blocks to the wider acceptance of gate arrays. User and vendor preceptions of the problem are not necessarily the same.

For our next issue, we're planning a survey of design-automation tools for gate arrays, and a detailed look at an in-house gate-array design system that has been used with great success. We'll also have two articles on some exciting new chip designs, as well as a variety of other topics that we think you'll find well worth your attention.

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