

XXVI. DIGITAL SYSTEM DESIGN AUTOMATION*

Academic and Research Staff

Prof. F. F. Lee
J. B. Kasarda

Graduate Students

H-m. D. Toong
K. H. Yung

RESEARCH OBJECTIVES

The convenience of problem-oriented programming languages, such as FORTRAN, ALGOL, and COBOL, has facilitated the design of complex and large computer programs. Moreover, these languages have made it possible for scientists and engineers with similar interests to communicate effectively and precisely regarding methods of problem solutions despite an ever-increasing variety of machines.

At the present time, most digital system design is carried out by procedures similar to the programming that was done before the problem-oriented programming-language days. With the availability of integrated digital circuit modules of increasing functional capability, there is an urgent need (a) to provide a design language that allows effective and precise communication of digital system design and (b) provides a set of computer procedures to analyze systems described in such a language, (c) to simulate the behavior of the system, and (d) to realize the system in terms of a set of available physical modules.

Our work in this field was started about two years ago. During the past year, a design language syntax has been defined, and a compiler and simulator based on an earlier version of the syntax were programmed. Certain aspects of the realizer have been examined, namely the derivation of the Boolean gating expressions from a system description.

The continuing objective of this research is to pursue the software development associated with the design language and to field-test the utility of the design system in an undergraduate advanced digital project laboratory environment. During the coming year, emphasis will be on the compiler and simulator design for the current language syntax.

F. F. Lee

*This work is supported by the Joint Services Electronics Programs (U.S. Army, U.S. Navy, and U.S. Air Force) under Contract DA 28-043-AMC-02536(E).

