XXX. DIGITAL SYSTEM DESIGN AUTOMATION[*]

Academic and Research Staff

Prof. F. F. Lee
Dr. F. C. Hsieh

Graduate Students

B. S. Franklin
H-m. D. Toong

RESEARCH OBJECTIVES

The development of problem-oriented programming languages, such as FORTRAN, ALGOL, and COBOL, during the past fifteen years has facilitated the design of complex and large computer programs. Moreover, these languages have made it possible for people to communicate effectively and precisely the method of problem solutions, overcoming the barriers of space, time, and the large variety of machines.

At the present time, the practice of 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 provides a set of computer procedures to analyze systems described in such a language, (b) to simulate the behavior of the system, and (c) to realize the system in terms of a set of available physical modules.

Some preliminary work in this field has been done at the Research Laboratory of Electronics during the past year. This includes the description of the over-all design system, which comprises a design language, a compiler, a simulator, and an open-ended system realizer. At present, the design language syntax has been defined in Backus-Naur form, and the compiler has been written and partially tested.

The 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.

F. F. Lee