XXXII. ADVANCED COMPUTATION SYSTEMS

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RESEARCH OBJECTIVES

The basic objective of this group is to gain an understanding of the complementary aspects of human and machine information processing, with a view toward developing design and evaluation criteria for interactive, man-machine systems.

Such man-machine systems are composed of a human operator, a machine Program Library, and a communications interface. Our present primary interest centers about devices and languages by which information and control data can be transmitted between the human operator and computer through graphics, that is, by means of hand or machine-plotted symbols, lines, and figures.

We have nearly completed an experimental and theoretical study of character generation and recognition. This study has led to the design of a low-cost special-purpose processing system for a relatively unconstrained (with respect to size, location, orientation, and slant), 256 character symbol font decoding system. The technique, which was designed for hand-drawn, disconnected block or cursive Greek and mathematical symbols, is now being studied with a view toward extension to highly complex symbol fonts such as Chinese, Arabic, and shorthand.

We are currently exploring several areas of application for all-graphic intercommunication, primarily in discrete and linear system design and simulation. From these applications we hope to form a better interpretation of the behavior of the human operator in a man-machine system, as well as gain a better understanding of the appropriate split between human and machine processing.

To round out the picture, studies are under way on problems of definition of computer capacity, computer system simulation techniques, and computer analysis of machine programs.

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