THE OHIO STATE UNIVERSITY

CENTENNIAL

1870 - 1970

HISTORY

of

DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

1966 - 1969

by

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I. INTRODUCTION

The Department of Computer and Information Science, located administratively in the College of Engineering, was established in October of 1968 as a natural elevation of the Division of Computer and Information Science to Departmental status. The Division, which was established in July, 1967, in turn was formed from two existing divisions, the Division of Computer Science and the Division of Information Sciences. These two divisions had been established in 1966.

The Department is presently physically located on the first floor of Caldwell Laboratory, having moved from its original location on the fourth floor of Caldwell Laboratory in March of 1969.

II. THE AREA OF ACADEMIC CONCERN

Computer and information science deals on the one hand with the body of knowledge concerned with the quantitative relationships, concepts, theory, and methods common to the processing and utilization of information in different fields, and on the other hand with the theory and operation of the automatic equipment and systems used to process information. Common properties of information are induced logically by the study, in part, of specific areas of science and technology which have a concern with the handling of information. Information is defined as data of value in decision making.

Computer and information science is concerned with the nature and properties of information, its origins, codification, transmission, decodification and assimilation. It is concerned with the conceptual nature of information and with the various types of transformation to which it can be subjected. Computer and information science is also concerned with the physical machines which perform these transformations, with the elemental units of which the machines are composed, and with the organization of these units into efficient, perhaps intelligent, devices for processing information.

Since every aspect of mans' activity requires information, computer and information science is an interdisciplinary field. The fundamental theory of information processing and the exploration of the limits of the abilities of computing machinery are topics in pure and applied mathematics. Numerical analysis is concerned with the accuracy and efficiency of practical numerical procedures in the area of applied mathematics.

Computer and information science shares with electrical engineering an interest in the characteristics of physical machines and in computer design; with linguistics an interest in the structure and interconvertibility of languages. The organization and control of industrial and business operations is of interest, as is investigation in the area of artificial intelligence, the latter being closely allied to studies in psychology and biology. Molecular transfer of information is of interest both in computer and information science and in chemistry and biology.

In the past, many of these subjects have been pursued as parts of various separate fields, with the result that the broad underlying principles of information have gone unrecognized. Today, increasing recognition is given to the strong common basis of all of this work, and computer and information science has been established as an independent discipline at The Ohio State University.

III. SCOPE OF THE OHIO STATE UNIVERSITY PROGRAM

As with any new and dynamic discipline, the activities encompassed in the discipline of computer and information science (or of some similar name) show considerable variation from organization to organization or from university to university.

The program in Computer and Information Science at The Ohio State University has been defined broadly to encompass most of the analytical activities frequently considered to be part of this discipline. This approach has been chosen because it is felt that in order to generate the needed concepts, foundations, and generalized techniques, it is necessary to examine analytically a number of different areas of computer and information science. In this way a firm empirical and theoretical foundation may be laid for generalized information systems. Such a view commits the program not only to the study of information systems, but also to the study of their realization and the impact of the user. It is fully anticipated that all of the research will generally be applicable to one phase or another of information systems design and operation.

The academic and research areas which the Department of Computer and Information Science now has under development are as follows:

1. General theory of information
2. Information storage and retrieval
3. Artificial intelligence, self organizing and adaptive systems
4. Theory of automata and finite state machines
5. Pattern recognition
6. Information processing, transmission, and communication in biological systems
7. Theory and operation of man-machine systems, and the man-machine interface
8. Management information, including logistics information systems, theory of organization, information as a resource
9. Computational and mechanical linguistics, semantic analysis, machine translation
10. Theory, design, and application of computer languages and translators
11. Numerical analysis and theory of algorithms
12. Computer systems: theory, design, and applications
13. Social, economic, and psychological aspects of information production and processing

IV. BACKGROUND AND ACCOMPLISHEMNTS

The Department of Computer and Information Science, as was pointed out in the Introduction, has its origin in the formation of the two divisions elicited. The Division of Information Sciences had its origin with the formation of an inter-disciplinary Committee on Information Science under the Vice President of Academic Affairs in September, 1965. The University at all levels, particularly at the vice presidential level, recognized the necessity for developing a broad, strong, and high quality academic and research program in information science. Accordingly, a committee was appointed to undertake the initial steps. Considerable interest was also expressed in such a program at Ohio State by both Battelle Memorial Institute and Chemical Abstracts

Service, both organizations being located contiguous to the University. Each of these organizations formally offered to assist in the development of both the research and academic programs.

This Committee on Information Science: 1) developed a preliminary program in information science to be undertaken by the University; 2) developed a preliminary interdisciplinary plan for a research program in the information sciences to be undertaken in large part by staff from The Ohio State University's Departments of Psychology, Biophysics, Linguistics, and Electrical Engineering, and also by staff from Battelle Memorial Institute and Chemical Abstracts Service; 3) chose a chairman for the Division of Information Sciences who would also act as Director of a proposed Information Sciences Research Center.

This position of Director and Chairman was filled by Dr. Marshall C. Yovits, who joined the faculty of The Ohio State University after many years with the Office of Naval Research, where he had been involved with a number of different phases of information science. Dr. Yovits came to Ohio State in September, 1966, and began the organization and development of the new Division of Information Sciences including curricula and research as well as the recruitment of staff and students.

Recognizing the large areas of common interest and interdependence between the Information Sciences program and an existing Computer Science program, the University faculty and administration recommended the combination of the two Divisions to form the Division of Computer and Information Science, under the Chairmanship of Dr. Yovits, with Dr. T. W. Hildebrandt as the Associate Chairman. Dr. Hildebrandt, a computer pioneer and numerical analyst, had been the Acting Chairman of the Division of Computer Science. The merger took place in July, 1967, with the scope of interests indicated in the previous section.

The combined program had much greater strength and breadth than either of the former programs. Accordingly, the University was able to make firm and growing commitments to the development of this program. The combined Division was able to achieve a self-sustaining threshold considerably earlier than either might otherwise have done. This culminated in the elevation of the Division to Departmental status in October, 1968.

In the period of time since September, 1966, a dynamic operating Department of the University has been firmly established. A staff of twelve full-time professionals has been assembled, supplemented by ten other professional staff from other departments and the University Computer Center, from Battelle Memorial Institute and Chemical Abstracts Service, and from other universities in a visiting capacity.

The University has made a long term, increasing financial commitment to the establishment of a broad, strong, high quality program in computer and information science.

As mentioned earlier, Computer and Information Science has been defined and a specific scope of operations covering both the academic and research parts of the program has been developed. Thirteen separate detailed areas of interest have been established. Academic programs have been started in nine

of these areas. A total of 44 courses, mostly at the graduate level, have been developed and approved by the University. Academic programs leading to the degree of Bachelor of Science in Computer and Information Science, degree of Master of Science, (with three separate options) and the degree of Doctor of Philosophy have been developed and approved by the University Faculty, by the Board of Trustees of the University, and by the Board of Regents of the State of Ohio.

Student response has greatly exceeded expectations. There are more than two hundred declared majors in the undergraduate program, and many other students who are interested in a major in Computer and Information Science. There are about 85 graduate students, most of them full-time (some are part-time and employed in local profit and non-profit organizations), registered in the M.S. program and four enrolled in the Ph.D. program.

The acceptance of the program by other departments within the University community has been gratifying. Many of them have been most anxious to cooperate and assist with both the academic and the research programs. A number of new courses has been developed by other departments primarily for Computer and Information Science students and are being taught by instructors from these other departments.

Cooperative arrangements have been established with Battelle Memorial Institute and Chemical Abstracts Service whereby staff from these organizations assist in developing appropriate courses and are provided for teaching these courses. A joint research program has been established with Battelle Memorial Institute as well. In addition, North American Rockwell Corporation and Battelle Memorial Institute have assisted the Department in supporting a Distinguished Lecture Series in the Information Sciences.

A strong integrated research program has been developed which already involves nine of the thirteen areas indicated in the section on Scope. This research program involves the staff of the Department of Computer and Information Science, staff of other departments closely allied with Computer and Information Science, and staff of Battelle Memorial Institute.

The research program is a growing one and has as a vehicle the Computer and Information Science Research Center which was established by a grant from the National Science Foundation in 1966.

V. ACADEMIC PROGRAMS

The Department of Computer and Information Science currently has academic programs approved by the University Faculty, the University Board of Trustees, and the Board of Regents of the State of Ohio leading to:

1. Bachelor of Science in Computer and Information Science

2. Master of Science - with three options:
   a) Option I - for the student expecting to continue through the Ph.D.
   b) Option II - for the student specializing in Information Systems
   c) Option III - for the student specializing in Computer Systems

3. Doctor of Philosophy

The Bachelor of Science degree in Computer and Information Science is designed to give the student a basic background in mathematics, a practical and theoretical knowledge of the fundamentals of computer and information science, and a broad familiarity with a number of the different areas which contribute to computer and information science. These areas include biology, chemistry, electrical engineering, industrial engineering, linguistics, physics, physiology, and psychology. The graduate of this program is equipped either to pursue graduate work in computer and information science or for employment in the computer and information-processing industry.

The Master of Science degree is designed with three separate options, depending upon the interests and goals of the students. The Ph.D. degree is flexible and tailored to the particular background and interests of the individual student. For this degree students are encouraged to supplement their computer and information science courses with appropriate relevant courses offered by other departments.

VI. COMPUTER AND INFORMATION SCIENCE RESEARCH CENTER

The Center is an inter-disciplinary activity involving the staff and graduate students of the Department of Computer and Information Science as well as the staff and graduate students of many other University departments closely allied with Computer and Information Science and the staff of Battelle Memorial Institute and Chemical Abstracts Service. It is expected that, as the program continues to develop, other organizations with additional capabilities in computer and information science located in the Columbus area will also become involved.

The purpose of the Center is: 1) to develop a broad research program in computer and information science; 2) to develop, test, and evaluate applications of research in computer and information ceience to practical situations; and 3) to coordinate and integrate these functions with an academic program in Computer and Information Science at The Ohio State University.

The Ohio State University has committed itself to developing a strong and broad program in Computer and Information Science. The Research Center is an important part of this University program closely interacting with and helping to generate the academic program.

VII. COMPUTER FOR RESEARCH AND EDUCATION

Under a grant from the National Science Foundation, the Department of Computer and Information Science has acquired a PDP-10 computer. This is a moderately powerful and flexible modular computer which it is expected will form the nucleus of a University Research and Education Computer Laboratory. The PDP-10 is expected to be installed and operable by the fall of 1969.

The University Research and Education Computer Laboratory will complement the function of the existing Computer Center in the following sense: The Computer Center's current equipment is dedicated to around-the-clock service to the entire University user community. Consequently, it is not available for research on or involving the computer itself. It cannot be shut down

for other than absolutely essential maintenance. On the other hand, the Research and Education Computer will be available for this type of research and will permit desirable modification of software or hardware (in particular, interfaces).

The need for such a research and education computer is acute at The Ohio State University. Already a number of important research problems exist (primarily arising from the research of staff members of the Department of Computer and Information Science) that cannot effectively be performed on the Computer Center's current or expected dedicated service computers. Many of the important developments in computer technology in the past have arisen from universities, not from industry, where complete access to certain computers was not only allowed but encouraged. It is important to establish the opportunity for conducting significant research in non-standard, but nonetheless vital areas of scientific inquiry.

The University Research and Education Computer facility coupled together with the new service computers in the Computer Center will provide an extremely powerful overall computer facility and will allow The Ohio State University the opportunity to become a leader in all phases of computer research and development.

Such a laboratory as mentioned above will eventually comprise the following:

(a) a medium-sized research computer

(b) visual and graphic display systems (e.g., cathode-ray tubes with light-pens, character display devices, and plotting devices)

(c) interfaces between the research computer, the various laboratory devices and other campus computing facilities, in particular, the University's service computer systems

(d) analog and hybrid computers

(e) digital and analog modules for developing new systems

(f) graphic input devices

The laboratory outlined above would serve the following main functions:

(1) rounding out the University's overall computing facilities, thus forming a powerful basis for attracting scientists, researchers, and good students to the University.

(2) serving as a test-bed for novel and innovative applications of computers, including such things as computer-assisted instruction.

(3) permitting research in classes of problems not feasible on the Computer Center's service dedicated systems.

(4) serving as a powerful and vital educational tool for students concerned with computer and information science.

In fulfilling these functions, the laboratory would serve as an essential adjunct to the University's academic program in computer and information science. This laboratory would then become analogous to a physics laboratory, dedicated to research in physics, or a language laboratory, dedicated to instruction and research in linguistics.

The first and most important step in the implementation of the laboratory sketched above is the acquisition of the PDP-10 computer.

VIII. CHRONOLOGY

1965 Committee on Information Science

1966 Division of Computer Science Established
Division of Information Science Established
Computer and Information Science Research Center Established

1967 Division of Computer and Information Science Established

1968 Department of Computer and Information Science Established

1969 PDP-10 Research and Education Computer Acquired

IX. DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE FACULTY

Marshall C. Yovits, Ph.D. (Yale University)
Professor & Chairman of Department of Computer and Information Science and Professor of Electrical Engineering
Information Systems, General Theory of Information, Self-Organizing Systems

Roy F. Feeves, Ph.D. (Iowa State University)
Professor of Mathematics & Professor of Computer and Information Science
Numerical Analysis and Programming

Ronald L. Ernst, Ph.D. (University of Wisconsin)
Associate Professor of Computer and Information Science and
Associate Professor of Psychology
Human Information Processing

Clinton R. Foulk, Ph.D. (University of Illinois)
Associate Professor of Computer and Information Science
Programming Languages, Systems Programming

Jerome Rothstein, A.M. (Columbia University)
Associate Professor of Computer and Information Science
Informational Problems in Science, Methodology, Biocybernetics

Marion R. Finley, Jr., Ph.D. (University of Michigan)
Assistant Professor of Computer and Information Science
Theory of Intelligent and Self-Organizing Systems

Douglas S. Kerr, Ph.D. (Purdue University)
Assistant Professor of Computer and Information Science
Numerical Analysis and Programming

Anthony E. Petrarca, Ph.D. (University of New Hampshire)
Assistant Professor of Computer and Information Science
Information Storage and Retrieval

Larry H. Reeker, Ph.D. (Carnegie Mellon University)
Assistant Professor of Computer and Information Science and Assistant Professor of Linguistics
Artificial Languages, Automata Theory

James E. Rush, Ph.D. (University of Missouri)
Assistant Professor of Computer and Information Science
Organization of Information

Lee J. White, Ph.D. (University of Michigan)
Assistant Professor of Computer and Information Science and Assistant Professor of Electrical Engineering
Mathematical Programming, Control Theory, Hybrid Computers

Robert F. Mathis, Assistant Professor in Computer and Information Science
Programming Languages

Beverly A. Tall(Barron), M.S. (Purdue University)
Instructor in Computer and Information Science
Programming Languages

David M. Jackson, Dipl. (Cambridge University)
Senior Research Associate in Computer and Information Science
Information Retrieval, Automatically Generated Classification of Information

X. ANCILLARY FACULTY

Richard I. Hang, M.S. (The Ohio State University)
Professor of Engineering Graphics
Computer Graphics, Engineering Application of Computers

Harry W. Josselson, Ph.D. (University of Michigan)
Visiting Professor of Computer and Information Science
Computational Linguistics

Harold B. Pepinsky, Ph.D. (University of Minnesota)
Professor of Psychology and and Professor of Computer and Information Science
Clinical and Socio-Cultural Psychology

Charles Saltzer, Ph.D. (Brown University)
Professor of Mathematics and Professor of Computer and Information Science
Coding Theory, Numerical Analysis, Automata Theory

Clyde H. Kearns, M.S. (The Ohio State University)
Associate Professor of Engineering Graphics
Computer Graphics, Engineering Application of Computers

James B. Randels, Ph.D. (The Ohio State University)
Assistant Professor of Computer and Information Science and Mathematical Analyst, Computer Center
Computer Systems and Languages, Mathematical Program Libraries

Lester O. Eagle, B.S. (West Virginia Institute of Technology)
Lecturer in Computer and Information Science
Computer Systems

David M. Liston, Jr., B.S., P.E. (Illinois Institute of Technology)
Lecturer in Computer and Information Science
Document Handling Systems, Information/Data Analysis Manipulation and Processing, Storage and Retrieval Theory

Ronald L. Wigington, Adjunct Associate Professor
Computer Systems and Information Systems