NEW BUILDING

As of this writing our department is completely moved into The Hill Center for Mathematical Sciences. (Next to the Engineering Bldg. on the University Heights campus). In spite of all the initial inconveniences, the new building is quite pleasant. Special thanks go to Professor Orgass who acted as building coordinator for the department.

FACULTY ARRIVALS AND DEPARTURES

A number of new people joined our faculty last September. Although they have been with us several months we never have introduced them formally in these "Proceedings". Our new colleagues and their research interests are:

Dr. R. Vichnevetsky, Professor (computer-oriented applied mathematics, numerical analysis, optimization, simulation, hybrid computations)

Dr. I. Polonsky, Adjunct Professor (programming languages, symbol manipulation, processes, operating systems)

Dr. S. Levy, Associate Professor (theory of computation, machine organization, switching theory)

Dr. M. Grigoriadis, Adjunct Associate Professor (computer-oriented applied mathematics, mathematical programming, modeling and simulation)

Dr. B. Bruce, Assistant Professor (language processing, artificial intelligence, logic)

Dr. E. Wilkens, Assistant Professor (switching theory, machine organization, real-time computations)

Dr. C. Beaucage, Adjunct Instructor (topology, mathematics instruction)

Mr. T. Ostrand, Instructor (automata theory, software design)

Dr. D. Freeman, Professor and Director of the Rutgers University Center for Computer and Information Services.

Unfortunately, we lost Professor S. Droege last Fall (she moved to another part of the country). Prof. Droege had been with the department since its formation.

During the Spring 1972 semester, Dr. K. Kaplan, who has been an adjunct member of the faculty in the past, has joined us full time as a Visiting Associate Professor.

REVIEW OF THE UNDERGRADUATE PROGRAM

The current undergraduate program has been in operation for 2 years now. Based on initial feedback from both faculty and students, a general review of the program is currently in progress. A
A few changes may go into effect during the AY 1972-73. Most modifications, however, will not go into effect until the AY 1973-74. The changes currently being discussed are more operational than fundamental in nature. They involve the order in which material is presented and the precise content of each course. The need for additional undergraduate courses is also being discussed.

The department is attempting to develop programs that meet the needs of both computer science majors and students in other areas who require a working knowledge of computers. In addition the department is committed to the development of courses for the student who does not have a technical (mathematical) background but who nevertheless is interested in a basic introduction to computers, their range of application, and their impact on society.

INTER-COLLEGE PROGRAMS

Professor Amarel has been chairing an inter-college program committee. This committee has recommended the initiation of four programs involving Livingston College. They are (1) Computer Science and Engineering, (2) Bioengineering, (3) Biochemistry, and (4) Civil Engineering and Urban Planning. Professor Srinivasan is working with people in Electrical Engineering to plan the program for (1). Professor Vichnevetsky is serving as a consultant to the groups working on (3) and (4). The recommendation of appointing interim program committees to develop programs for initiation in AY 1972-73 has been accepted by Deans Easton and Lynton.

CSENJ

Progress is being made in planning a symposium on Computer Science Education in New Jersey. The DCS, which is organizing the symposium is currently contacting people in the professional societies, academic people, people in industry, and people in the state and national government who are interested in computers. The symposium would attempt to determine where computer science education shall be going and how various departments throughout the state can better coordinate their information processing, data processing, and computer science programs.

SUMMER

The department and the summer session office are in the final stages of arranging for two graduate computer science courses to be given this summer. The idea was initiated based on a request from the Western Electric Co. who will supply most of the students. DCS graduate students will also attend the courses. Professor Baxendale has been in charge of liaison with Western Electric. The courses that are likely to be given are Advanced Programming Techniques (503) by Professor Rabinowitz and Machine Organization (508) by Prof. Levy.

At the undergraduate level, 198: 311-312 (Computers and Programming) will again be offered this summer. Professor Wilkens will be giving the course.

ACM STUDENT CHAPTER

Prof. Bruce has taken over the job (previously held by Prof. Droege) of faculty advisor to the Rutgers ACM Student Chapter. The officers this year are Don Young (Pres.), Kathy McCrea (Vice Pres.), and Kathy Petron (Sec.-Treas.). Activities during the fall included a talk by Richard Spague on "Computer Analysis of the Kennedy Assassination", a talk by Prof. Cox on CALL/360, a talk by Dr. D. Freeman on jobs in the computer science field, and a Christmas party at Prof. Bruce's house. The activities for the Spring include another national lecturer, a picnic, and election of next year's officers.
CAI-TVAI

Just a reminder that there is a new graduate course on CAI, Topics in Computer Education (198:570), being given by Prof. Beaucage this spring.

Also, under the heading of TV aided-education, the next departmental colloquium (Feb. 17) will be video taped for future viewing by those unable to attend the talk. Our initial experiences with this procedure will provide the basis for future TVAI plans in the DCS.

COMPUTER POWER

A large amount of time has been spent by various members of the Computer Science Department during the last 9 months planning and evaluating various computer configurations to meet the batch and interactive computing needs at Rutgers. At the end of last summer Professors Orgass and Srinivasan produced a large two volume report on this subject. During the fall semester Professor Paull chaired a task-force which made an intensive study of the CP/CMS system. The task force was composed of DCS faculty and people from CCIS, Princeton, and the ECC. More recently, Professor Amarel, aided by a number of DCS faculty, produced a report which analyzes the Rutgers Computing Plan for Batch and Elementary Time Sharing.

The most recent report contains a plan for a system to support advanced time-sharing at Rutgers, Princeton and the ECC schools. The report was produced by Professors Falk and Levy of the DCS and proposes a modified PDP-1050 configuration.

The proposed configuration was developed on the basis of demand estimates for advanced time-sharing in the New Jersey higher education community, previous computer studies carried on at Rutgers, (see above), an analysis of the hardware, and numerous discussions with satisfied PDP-10 users. The price of the PDP-10 also makes it the most cost-effective way to support advanced time-sharing.

The lack of a stable advanced time-sharing facility has had a negative impact on both our teaching and research programs in the past. We hope that the PDP-10 plan (which has been approved by the University Long-Range Planning Committee on Computing) will be implemented in the very near future.

MIX

A MIX simulator and a MIXAL assembler are now available on the 360 at CCIS. Details on MIX and MIXAL can be found in The Art of Computer Programming Vol. 1 by D. Knuth (Addison-Wesley). Specifics concerning the Rutgers implementation and operating instructions will soon come out in the form of a departmental report by Frank Brice.

NEW REMOTE ENTRY STATION

The IBM 2780 remote entry station in Tillett Hall will soon be replaced by a UCC-1225. The UCC-1225 is logically a PDP-8 minicomputer and can, therefore, provide small amount of "hands-on" computer experience when not in use as a remote entry station. However, according to Prof. Rabinowit, the "console" is in a rather awkward position and a bit of bending is required to get at it. The UCC-1225 is also less expensive than the 2780.

NIH RESOURCE

Work on the NIH Research Resource which officially started last summer is continuing. During the fall semester a Computers in Biomedicine seminar series was begun. The speakers so far were Dr. Ralph Engle (Cornell Medical School) on "Computer-Aided Medical Diagnosis", Dr. Harry Pople (University of Pittsburgh) on "Computer Modeling of Neural Systems", Prof. Edward Feigenbaum (Stanford University) on "Artificial Intelligence Methods in Scientific Inference", Dr. J. Carbonell (Bolt, Beranek, & Newman Inc.) on "Artificial
Intelligence Approach to Computer Assisted Instruction", and Prof. Jack Sklansky (University of California, Irvine) on "Biomedical Image Processing." During the fall weekly technical working meetings were also instituted.

Up to this point progress toward implementing some of the systems being developed under the resource has been hindered by the lack of an adequate and stable advanced time-sharing facility at Rutgers. Since early February, however, such a facility has been available. Time on the PDP-10 system at Applied Logic Corporation of Princeton is being purchased and 3 terminals are now available for use by the resource. This is only an interim solution to the problem of advance time-sharing at Rutgers. The cost of time-sharing services precludes the possibility of purchasing time commercially when any large amount of computing is contemplated over an extended period. (It doesn't pay to rent!)

LOOKING FOR SUPPORT: $  

The DCS is currently having preliminary discussions with ARPA (The Advanced Research Projects Agency) to see if they would be interested in supporting some of our research in the areas of artificial intelligence and automatic programming. Computing resources for this research would be supplied through the ARPA Network, a nation-wide network connecting university and research organization computing centers. In the near future, some of these same ideas will also be submitted to the National Science Foundation (NSF) for possible support.

DEPARTMENTAL TECHNICAL REPORTS  

A number of new departmental technical reports have become available since the last edition of this newsletter. They are:

#10 "A Set of Goals and Approaches for Education in Computer Science" by Saul Amarel  

#11 "On the Practicality of Nanna's Method of Verifying the Termination and Correctness of Programs" by S. Droege  

#12 "Roots of Polynomials by Newton's Iteration" by D. Beaucage  

#13 "Numerical Stability of Methods of Lines for Partial Differential Equations" by R. Vichnevetsky  

#14 "Errors Propagation & The Numerical Solution of Optimization Problems" by Robert Vichnevetsky

COMPUTER SCIENCE COLLOQUIA

The coordinator for the computer science colloquia this year is Prof. Saul Levy. The program for last fall is listed below.

The UCSB Statistics Project: Some Efforts to Make Statistics Palatable to Psychology Undergraduates - Prof. James W. Livingston - Psychology Dept., Livingston College  

Process Synchronization Without Long-Term Deadlock - William B. Easton - Applied Logic Corporation  

Reliable Numerical Methods in Linear Algebra - Peter A. Businger - Bell Telephone Laboratories, Inc.  

The General Status of Regional Academic Networks - Dr. David Freeman - Director of CCIS, Rutgers University  

Flow Chart Hierarchy Documentation Program - Dr. Morton Lewin - RCA Laboratories  

On the Minimal Number of Comparisons Needed to Find the Median of the Finite Set of Integers - Prof. Manuel Blum - University of California, Berkeley  

Roots of Polynomials by Newton's Iteration - Prof. David Beaucage - Dept. of Computer Science, Livingston College  

The ARPA Network: Techniques & Impact - Steven Crocker - Advanced Research Projects Agency  

Emulation: An Application of Microprogramming - Prof. Robert Rosin - SUNY at Buffalo
PUBLIC LECTURE SERIES

Under the direction of Professor C. Kulikowski, a public lecture series was presented by the Computer Science Department this fall. The goal was to examine some of the important places where computers impinge (and perhaps infringe) on our daily lives. The talks were given on Monday evenings and the hope was to attract a substantial number of undergraduates. Although the turnout was much less than we expected, those people attending the talks found them interesting and informative. The sessions held were:

1. Computer Science and Human Behavior - A Panel Discussion with Professors J. Livingston (Psychology, LC), C. Schmidt (Psychology, RC), L. Ward (Psychology, LC) and W. Fabens and B. Bruce,
2. Computers and Privacy - Prof. I. Rabinowitz,
3. Computer Robots - Prof. G. Falk,
4. Computer Science Education - Prof. S. Amarel, and
5. Computers and Our Health - Prof. C. Kulikowski.

TALKS, PAPERS, CONFERENCES, ETC.

As a member of the NIH Chemical/Biological Information Handling Review Committee of NIH, Professor Amarel was invited to site visits of the Computer and Biomathematical Sciences Study Section (of NIH) during the fall of 1971. He also attended the winter review meeting of the Study Section on January 26 in Washington. On January 27 he participated as a panelist in a special workshop on artificial intelligence research in NIH. In November, Professor Amarel gave a talk "The Representation of Problems for Machine Problem Solving" at the Jet Propulsion Laboratory.

Professor Falk has had a paper accepted by the Artificial Intelligence Journal. The paper "Interpretation of Imperfect Line-Data as a Three-Dimensional Scene" should appear in the Summer 1972 issue.

Professor Fabens participated at the ACM SIGPLAN Symposium on Pedagogic Languages with Small Computers, Jan. 6-7, 1972. He presented a paper entitled "PEDAGLOT: A Teaching Learning System for Programming Languages."

Professor Wilkens attended the 12th Annual Symposium on Switching and Automata Theory last October at Michigan State University. More recently (Feb. 3) he gave a talk at the Western Electric Research Laboratory on the "Application of Finite-State Machine Theory to Program Design."

Professor Ostrand recently had a paper published in the December 1971 issue of the Journal of Computer and System Sciences. The paper is entitled "Pattern Reproduction in Tessellation Automata of Arbitrary Dimension."

Professor Bruce presented a paper "Some Relations Between Predicate Calculus and Semantic Net Representations of Discourse" at the Second International AI Conference in London (Sept. 1971). Another paper, "A Model for Temporal References and its Application in a Question-Answering Program" has been accepted by The Artificial Intelligence Journal and will appear in the near future.

Professor Levy gave a talk last August on "Computational Equivalence" at the International Symposium on the Theory of Machines and Computations. In November he gave a talk at the Johns Hopkins University Computer Science Seminar on "Sorting Theorems and a Folk Theorem Revisited."

Professor Srinivasan is currently serving as a member of the program committee for the International Symposium on Fault Tolerant Computing (to be held in Boston, Mass. June 19-21 1972). He recently gave a talk at SUNY (Stony Brook) entitled "On Identification of Objects Described by Sets of Relations."

Professor Orgass served as a member of the program committee for the annual meeting of the Association for Symbolic
Logic in New York, December 27-28, 1971. In addition, Professors Easton and Orgass served as session chairmen.

During the week of week of January 4, 1972, Professor Orgass visited the Institut de Programmation in the Faculty of Science at the University of Paris and the Institut de Recherche d'Informatique et d'Automatique (IRIA). He lectured at IRIA on "Proofs of Statements About Programs".

On January 27, 1972 Professor Orgass delivered a lecture, "Proofs of Statements About Programs", at the Services de Mathe- matiques Appliquees-Informatique at the University of Grenoble.

Professor Kulikowski chaired a session on automated medical diagnosis at the Fifth Hawaii International Conference on System Sciences Subconference on Computers in Biomedicine. Together with Professor Amarel he presented a paper on Medical Models and Decision Making. This paper was based on work done in the NIH supported resource in the DCS. During his trip west, Professor Kulikowski visited the DENDRAL group (Feigenbaum, et. al) at Stanford and participated in discussions about AI applications in medicine. While in Hawaii he also did some work on the thyroid diagnosis project (at the University of Hawaii) which has been extended to deal with long term followup of patients.

Professor Grigoriadis organized two sessions on the Mathematical Programming Algorithms and Systems at the ACM '71 conference in Chicago, August 3-5, 1971. He presented a paper entitled Experimental Implementations of Mixed Integer Programming Algorithms at the ACM '71 Conference and was an invited speaker at the NATO Conference on Large-Scale Resource Allocation Problems held in Elsinore, Denmark in July 5-9, 1971 where he presented two papers: Minimum Cost Multistage, Multicommodity Network Flows and a joint paper titled Computational Experience With a Multicommodity Network Flow Algorithm. He is now organizing the Mathematical Programming Sessions at the ACM '72 to be held in Boston on August 14-16, 1972 and he is inviting contributions of papers for these sessions. He has also organized a session on "Modeling Methodologies for Production and Distribution" for the 41st National Meeting of the Operations Research Society of America to be held on April 26-28, 1972 in New Orleans.