Department of
Computing & Information Sciences

A newsletter for the
Department of Computing & Information Sciences
Kansas State University
234 Nichols Hall
Manhattan, KS 66506

Castle Computing

Vol. 1, No. 2

Greetings from the Department Head

Remember that in 1987 I promised that this newsletter would be an "annual" newsletter. Well, we started out that way with very good intentions; but the pressures of the academic calendar have certainly influenced a deviation from that course. With this second "annual" newsletter I will again make that commitment to get it out each Fall because we want to keep in touch with you alumni and friends. Many good things have happened during the past two years. The faculty has grown in size and quality; the undergraduate population has declined nicely; the graduate population has remained about the same; the equipment base has been expanded; and our research productivity has improved both in quality and quantity.

First, let me talk about the changes in the nature of the Department. For many years we were a little understood discipline with too few professors (10) to do justice to the many majors (approximately 700) in Computer Science and Information Systems. As a result, research productivity was minimal, computing laboratories were inadequate, and we were in an old building. In the past few years, industrial equipment grants (equipment worth $3 million over a five year period) have established a very good equipment base, the student/faculty ratio has dropped to a respectable 25:1 (we are finally able to do a good job in advising our students and understanding their

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overall needs), research publications have tripled, and extramural funding has tripled. Furthermore, we feel very much at home in Nichols Hall and have established ourselves as a major thrust of Kansas State University as listed by the Kansas Board of Regents in the Mission Statement for KSU. All in all, it has been very pleasant.

We are now ready to move forward in facing the challenges of the 90's. Our goals are as follows:

We will strengthen our graduate education and research programs with an increase of faculty in the areas of software engineering, programming languages, data base systems, artificial intelligence, and distributed and parallel computing. As a result, the undergraduate curricula will be improved with the additional faculty expertise and resources.

We will provide integrative computing technologies to other disciplines. That is, we will move to integrate our research into the problem solutions of researchers in areas such as physics, art, engineering, agriculture, economics, etc. Synergistic effects on all disciplines will result.

We will produce knowledge workers for the 21st century, graduates from many disciplines who can enhance the knowledge of their own fields through the power of computing.

We will contribute to the ability of Kansas and the Nation to be globally competitive through improvements in computing theory and technology.

We will build a strong relationship with our alumni and friends in the hopes of enhancing the future of us all.

In 1990, we will celebrate two decades of service to KSU; we will be planning some activities on campus. If you have ideas on how we can keep you involved in these or other activities in the Department, we welcome your input.

Thank you for your many contributions over the years; but more important, "thank you for being a friend".

"Older" Students in the Department

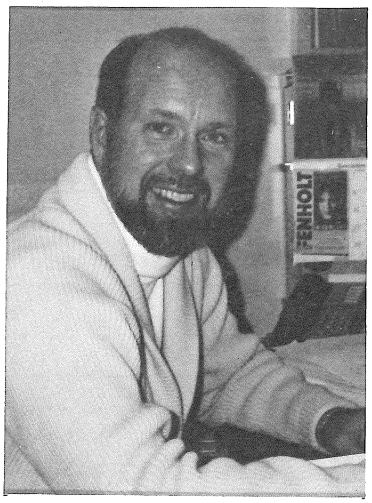
The age grouping for undergraduate classes generally follows traditional patterns, but the trend of so-called "older students" coming to school is holding true for our department. For example, nineteen is the largest age group for freshmen, twenty for sophomores, twenty-one for juniors, and twenty-three for seniors. The average is higher for each class, however. The average age for freshmen is twenty-two, sophomores twenty-three, juniors twenty-five, and seniors twenty-six. During the 1987-1988 school year, our youngest declared major was seventeen, and the oldest was fifty-nine.

Older students make up a significant percentage of our undergraduates. Older students are defined by the FENIX program as undergraduates twenty-five or older who are starting or returning to school. The FENIX program on campus is designed to provide a support group for those older students. The freshman class has 22% who are twenty-five or older, sophomores 23%, juniors 16%, and seniors 42%, or an overall average of about 26%.

The older students in class generally take their studies very seriously. They may be changing careers, coming back to finish a degree, or perhaps returning to school after not doing well at some earlier time. Studies indicate this age group will become a larger percentage of the undergraduate population as the average age of Americans becomes older and technology forces new work patterns.

For our part, we want to be sure these students have the support and counseling they need to be a success in our program.

Faculty Profile: Dr. William Hankley



Bill has been a member of the Department since 1972. Before coming to KSU he taught at the University of Utah and did PhD work at Ohio State University (Information Systems and Electrical Engineering) and BS and MS work at Northwestern University (Electrical Engineering). He recalls that he did not have an undergraduate major until he took a programming course at NU (FORTRAN no less), then he found a love of both computing and computing languages. His MS work at NU was on mathematical models of digital control systems. His Phd work at OSU was on image recognition and a data representation for finger prints. Besides teaching at Utah, he learned about the new area of interactive graphics.

At KSU, many MS and PhD students received admission letters from Dr. Hankley. Bill has worked on the graduate studies committee for over a decade, often serving as chair of that committee. Bill has been active in shaping the graduate curriculum. He started the graduate courses on computer graphics, software engineering, and "programming science", which is about formal specification and verification of programs. He is writing a text about specifications and verification and has just begun using it in the programming science course.

Bill has praises for the CIS Department that there is a harmonious, encouraging spirit, and that the Department delivers a sound education at good economy for the state. He has a goal of teaching that students perceive a view of computing concepts that transcend the short term, job

Supercomputing in the Department

This fall, we have installed a Scientific Computing Systems SCS-40, a vector computer (supercomputer type). It has the capability to execute 40 million instructions per second when the data is represented in vector form. In order to utilize this facility, a researcher describes the solution to a problem in a programming language such as FORTRAN and the compiler for the language converts the program into a form which optimizes the inherent parallelism in vector computations to achieve this high performance. Parallelism in computer programs can be likened to multiple identical assembly lines in a factory. Exactly the same operations must be performed on the items in each of the assembly lines and there is no dependency among the distinct assembly lines. Thus, they can be done in parallel. Problems in molecular modeling, structural and mechanical design and analysis, computational fluid dynamics, simulation and animation, graphics and imaging, scientific visualization, fractal calculations, atomic collisions, mathematics and statistical modeling, and large data base computations are just a sampling of the types of problems that are amenable to solution only if such computational power is available. Thus a wide spectrum of KSU disciplines can derive benefit from this facility.

The SCS-40 is a Cray X-MP/24 instruction set compatible system which runs the Cray Time-Sharing System (CTSS). A MicroVax II acts as a frontend for the SCS-40 for program preparation. Total data storage in the system is more than one billion bytes (characters). It is available on the KSU campus area network so that any lab or office that has access to the fibre-optic backbone or the data switch can have access to the system.

The installation of this system has been made possible through gifts from Scientific Computing Systems (orchestrated by Frank Carollo) and Xerox Corporation (Bill Spencer - KSU '60). This Computational resource is a significant addition to the research infrastructure of the University.

Faculty Profile: Dr. Masaaki Mizuno

Dr. Masaaki Mizuno joined the CIS department as an assistant professor in 1987 after completing his Ph.D. in computer science at Iowa State University. "I have been extremely happy here. I like Manhattan, the KSU campus and Nichols Hall. The research environment is very good—in particular, a friendly faculty and staff, excellent students, and expanding computer facilities."

Masaaki is originally from Japan. He received a B.S. and M.S. in Electrical Engineering from Keio University (Japan). "We have good hardware programs in Japan. Most students studying computers have experience in designing and building their own microcomputer systems. Software programs, however, were not as good (at least when I was a student there)." This made Masaaki decide to come to the U.S. for further study.

He earned an MS in computer science from Pennsylvania State University before entering the Ph.D. program at ISU.

While he was a student at ISU, Masaaki worked every summer from 1983 to 1986 for several computer companies in Japan. In his work there, he designed a single board Intel 8088 based CP/M-86 machine, an IBM-PC compatible machine, and a Zilog Z80 based controller for a high-speed paper burster. He also worked with a team at an elevator manufacturer to develop an Intel 8085 based controller for an inverter motor.

He mentioned that his implementation experience in hardware and software, together with his theoretical knowledge he learned at schools is very helpful in teaching and research.

Since joining our faculty, Masaaki has taught undergraduate-level courses in operating systems, (CIS 520), graduate-level courses in operating systems (CIS 720), computer networks (CIS 725), and analysis of algorithms (CIS 675). He has also developed a course on the implementation of an operating system (CIS 620), where students read the source code of a working operating system and modify it. He enjoys teaching these courses very much.

Masaaki has journal and conference publications in the areas of computer architecture and operating systems. His research interests include computer security and various aspects of distributed systems. He has developed an information flow control mechanism for modular programming systems. He also works with Dr. David A. Schmidt on theoretical aspects of information flow by applying methodology in programming semantics.

In his research in distributed systems, Masaaki and his students have developed very efficient distributed mutual exclusion algorithms. Currently, his research group is studying concurrency control and recovery issues of transaction based distributed data base systems.

"Because of my engineering background, I tend to emphasize practical aspects of computer science. For good research, however, theory is equally important. A department faculty that is well-balanced in theory and practice really helps my research."

Nichols Nugget: John Mogusar

John Mogusar, DeSoto, played chess against eight different opponents at the same time during fall 89 registration at Kansas State. Mogusar, a senior in Computer Science, is reorganizing the dormant K-State Chess Club and was playing so many games at one time to publicize the club. He played about 120 games during the registration period, and lost only 17. He is ranked nationally by the United States Chess Federation.

Faculty Profile: Dr. Maria Zamfir-Bleyberg

Maria is a native of Romania and received a Diplomate in Mathematics degree (equivalent to an MS in the USA) from the University of Bucharest, Romania. Maria then joined the Department of Mathematics at the University of Bucharest where she conducted seminars, developing an interest in programming language semantics.

In 1972 she came to the United States as a Fulbright-Hays Scholar to continue her research towards a PhD. After spending one year at UC Irvine, she moved to UCLA to work with Joseph Goguen, an internationally recognized authority in "Initial Algebra Semantics". That was the "turning point" in her research activity. In 1974, Maria returned to Romania and not until 1977 was she able to come back to UCLA in the PhD program.

In 1982, after receiving her PhD, Maria joined the Research and Development Department of the System Development Corporation in Santa Monica, California, where her research activities included the development of a mathematical model defining the semantics of FDM, a formal specification and verification methodology developed by SDC for complex systems.

In 1984 she returned to UCLA for teaching and research because she missed the stimulation of the academic environment and contact with students. In 1985 Maria attended the first conference on the "Mathematical Foundations of Programming Semantics", which was organized by Austin Melton and Elizabeth Unger in Manhattan. She was impressed by this midwest city, by the pleasant atmosphere and good computing facilities the Computing and Information Sciences Department at KSU offers, and by the high level of research in which many of the faculty were involved. Maria joined the department as an assistant professor in August 1986.

Maria's research activities include three different by interacting areas:

(i) The use of mathematical models in artificial intelligence applications for the design of knowledge-based systems.
(ii) The initial algebra semantics approach to software engineering and the theory of computation.
(iii) Mathematical models of concurrent programmming.

She is currently working on an algebraic representation of Petri nets.

IBM Employees Give Helping Hand to Students

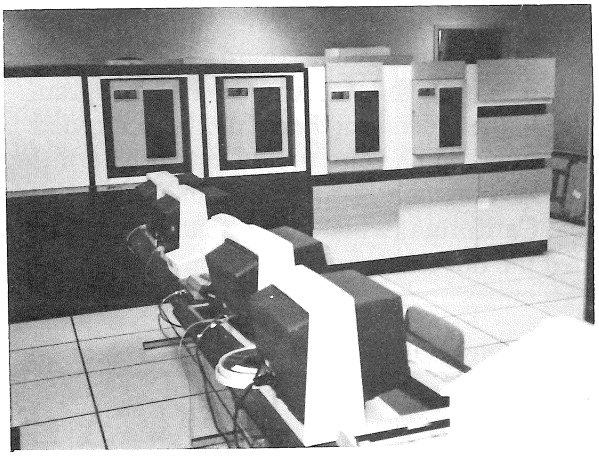
Since 1984 KSU alums who work for IBM have been contributing to the IBM Employees Scholarship Program. We thank each of them for their support of students who may not have had the chance to attend school without a scholarship. As a result of their concern for the future of computing, several students have had an opportunity to pursue a degree in Computer Science and/or Information Systems. We have supported four students who have finished and are out working in the "real world". In the Fall of 1989, we are providing two students with scholarships from the endowed IBM Employees Scholarship fund. IBM matches their contribution 2 for 1 and the Dean of Arts & Sciences has matched tthese scholarships with two more. As a result, each $100 contributed by an IBM Employee generated $600 of support for student scholarships. Thank you for your support of the "best and brightest" students to attend KSU.

AT&T Equipment Donations

For several decades these two organizations have had the traditional partnership of the university producing valued employees for industry. However, in 1980 a unique program was started which has further cemented the partnership. A Summer On Campus program in the Computing and Information Sciences Department was initiated for AT&T employees who wanted to pursue a Master of Science degree in Computer Science. These AT&T professionals spend five summers on campus to expand their computing research and development skills. Since AT&T has become a major force in computing and networking, it is important that their employees are trained in the state of the art of computing. Kansas State University also benefits from the program. Because these AT&T students are computing professionals, the faculty, as well as the on-campus graduate students, are continually appraised of the industrial perspective of the state of computing technology. Since 1984, more than 60 M.S. degrees have been granted in this program to AT&T student employees from 18 different AT&T sites across the nation.

This corporate partnership was further enhanced when, in 1986, AT&T awarded computing and networking equipment worth $300,000 to the Department of Computing and Information Sciences for the support of the undergraduate and graduate software engineering curricula. Six minicomputers and numerous terminals and software were included in the grant. Continuing support was provided in 1987 when AT&T granted Computing and Information Sciences and additional 10 minicomputers, 1 super-minicomputer, 70 personal computers, local area networking, and software to support both research and instruction. These facilities were worth $1 million and supported the distributed computing research program and expansion of the instructional programs in parallel programming and artificial intelligence. These computing facilities also support the undergraduate instruction program in algorithms, data structures, data base systems, and operating systems. Finally, in 1988 a grant to the Department of Computing and Information Sciences of hardware and software worth $700,000 brings their support of KSU to $2 million in three years. These computing facilities are located in Fairchild and Nichols halls; and they are interconnected by a campus-wide local area network donated by AT&T. This new equipment supports the distributed processing research capability. It also permits us to expand laboratory support for the graduate programs in concurrent programming, software engineering, data base systems, and knowledge engineering. It also supports the beginning programming courses in Computer Science, Information Systems, and Computer Engineering. In all, AT&T has granted KSU 15 minicomputers, 2 super minicomputers, 100 personal computers, several hundred software systems, several local area networks, and a campus-wide local area network. Through this networking facility, faculty and students are able to access national and international research networks, including access to national super computer centers. In addition, AT&T Data Systems in Kansas City provided the support for maintenance of this equipment.

Quality laboratory equipment is a major factor

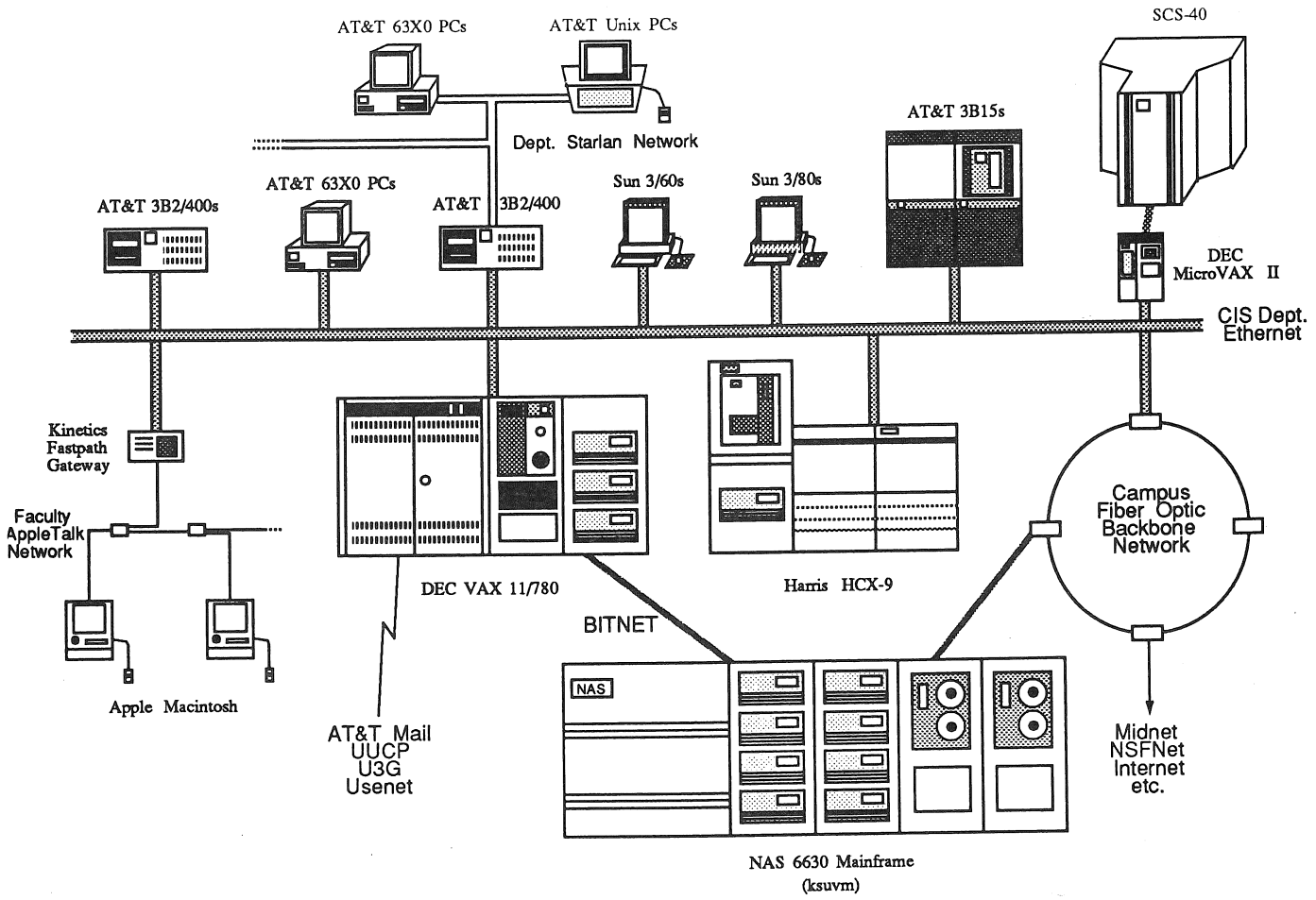


in providing quality educational programs. This state-of-the-art AT&T equipment is utilized by both graduate and undergraduate students in testing theories that are studied in the classroom. They can experiment with full-scale prototype software systems, thus acquiring "real world" research and development skills. As a result of these computing facilities grants, AT&T has provided laboratories that will be used by several thousand students each year. Industrial support of this kind is essential to a quality educational program. KSU is extremely pleased with its partnership with AT&T.

Networking: The Backbone of the Information Age

Imagine having a car in your driveway and no street ant the end of the driveway. You could only drive between your garage and the curb. Anything that you wanted to transport beyond the curb must be loaded onto a horsedrawn cart. This is equivalent to having a PC and no networking. Information has no value unless it is shared with others; and transporting it with floppy disks is very cumbersome. Thus, a heavy emphasis has been placed on departmental and campus networking. Throughout Nichols Hall we have four different kinds of networks: ethernet, starlan, broadband coax, and Appletalk. Students, faculty, and staff utilize these facilities to be more productive and share information. They transfer files, send/receive electronic mail, hold computer conferences, access bulletin boards, etc. Since the campus is equipped with fibre optic cable, access to other departments is easy. With access to the national Internet network (remember the Internet Virus), we can access the world. Below you can see the interconnectivity of the department, the equipment being donated by industry. Few departments have such an extensive array of networking facilities, making us one of the best equipped in the Midwest. Thanks, Industry, for caring about the future of computing professionals.

Computing and Information Sciences Departmental Network



Alumni News: Kirk and Melody Norsworthy

Kirk Norsworthy, a 1978 MS/CS graduate, recently returned to KSU to present AIX and OSF Topics as part of the joint ACM/Computing and Information Sciences Department lectures. Kirk is with IBM's Austin Development Laboratory and was until recently the Development Manager responsible for the development of IBM's AIX Kernel. AIX is IBM's UNIX based Operating System and has been available since 1982 on the IBM RT Systems. Kirk went on to explain the relationship that AIX has to the new independent software consortium, Open Software Foundation, which is attempting to establish an open set of standards for the UNIX market place. OSF is using AIX as the foundation for its Operating System offering and soliciting a variety of technologies for inclusion.

Kirk's first programming assignment with IBM was as a SQL Data Base Administrator with System R, the research prototype for SQL/DS and DB/2. He worked directly with the IBM Research Division to implement the largest Relational Data Base of its time for a Department of Defense Contract. The programs from this development were later extended for use with other contracts including B/52 and Space Shuttle. After the development of SQL/DS, he transferred to Austin where he worked on the development of Displaywriter's Report Pack and a Relational Data Base System for the RT System. This was followed by a stint in Product Planning where he reviewed emerging software technologies such as Office Automation and Desktop Publishing and assisted the start-up companies in their efforts to port their products to new hardware.

In 1987 Kirk assumed responsibility for the AIX Operating System Kernel and VRM where he worked closely with Open Software Foundation to make several key software deliveries. Currently, Kirk is a Technical Assistant to the Vice President of the Advanced Workstation Divsion.

Kirk was teaching Pl/1 to business majors in 1977 when he met Melody Taylor. Melody went on to receive her MS in Computer Science from SUNY Binghampton and began her career at IBM writing functional test programs for military computers like those used on the Space Shuttle. Melody worked in a variety of areas while at the Austin Laboratory including MVS support, Competitive Product Evaluation, and the design and development of IBM's PC family Voice Communications Option for Text-to-Speech and Speech Recognition.

For the last two years, Melody has worked in the State of Texas Sales Branch as a Customer Engineer supporting the Texas Parks & Wildlife State Agency. Kirk and Melody have found their experiences at KSU valuable to their careers. They have had their lives further enriched by the birth of their little girl Stacey.

Nichols Nugget: Possible Jobs

Frequently we get requests from business and industry that they are looking for experienced computer professionals, especially high quality individuals like KSU alums. If you are interested in such opportunities, please send us your resume.

Nichols Nugget: Departmental Library Keeps Students Informed

Since 1986, the CIS Department has maintained its own library. The departmental library collects newsletters, technical reports, and magazines that the University library does not. Its current holdings include a complete collection of ACM Special Interest Group newsletters, technical reports from 63 universities and research centers worldwide, journals published by ACM, IEEE, and AT&T, and a variety of popular computing magazines. Student's MS reports and PhD dissertations are also kept.

The library's subscriptions and staff (which consists of a student worker and a volunteer), are funded by donations and grants.

FROM

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FIRST CLASS
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Kansas Stat
P.O. Box 180
Manhattan,

In memorium: Bradford G. Blaker

Brad Blaker became part of our Department in 1983 as an undergraduate student. It was Brad's third career; he already had a degree in music from Kansas State University and was well-known as a musician and photographer. Initially Brad blended in with his fellow students, but as he progressed in his studies he began to have an effect on the Department. His maturity made him a spokesman for his fellow undergraduates, and those in the Department learned to listen and to appreciate what he had to say.

In the last semester before his graduation Brad learned that he had an uncommon form of lymphoma. It was a major ordeal that put all Brad's plans for graduation and a career awry. But with heavy chemotherapy Brad conquered the disease and came back more determined than ever to pursue an advanced degree in computer science and to become a teacher in that field.

Brad did not wait for his master's degree; he became an enthusiastic and popular graduate teaching assistant who could be found leading and supporting his students at almost all hours of the day or night. Brad became especially well known for the vast amounts of work he did in support of the compiler course taught by Dr. Pittman; the results of that work are heavily used even now.

Brad was not easy on his students: he made them search for solutions rather than taking the short route and simply supplying answers. But he also had the knack of helping people over a hurdle with his fine and gentle sense of humor.

In the Fall of 1987, with firm plans for his thesis project in place, Brad again received the dreaded news of a recurrence of lymphoma. Through the winter months of 1987/88 Brad rose from initial despair to a resolute optimism and strength that the proposed treatment of bonemarrow harvest, chemotherapy and radiation would put the ordeal behind him. He took a computer to the KU Medical Center and laid plans to meet his obligations as a teaching assistant and graduate student by grading work and returning comments by electronic mail. His attitude and outlook are reflected in the password he used for his computer accounts: "courage".

Brad's hopes did not come true. Surrounded by a steady stream of blood donors and supporters from the Department and from his wide circle of friends, Brad succumbed to his illness on the first of March. A memorial service was held on the 24th of March in the Danforth Chapel, with a small reception in the Nichols Hall atrium afterward.

In response to the wish of Brad's wife Sue, the Bradford G. Blaker Memorial Fund has been created with the dedication that the fund be used in support of educational activities in the Department of Computing and Information Sciences. The Fund is administered by the KSU Foundation, Hollis House, KSU. We hope that the fund will grow to sufficient size to become an endowment, so that it can become a permanent tribute to Brad's example as an inspiring and dedicated teacher.

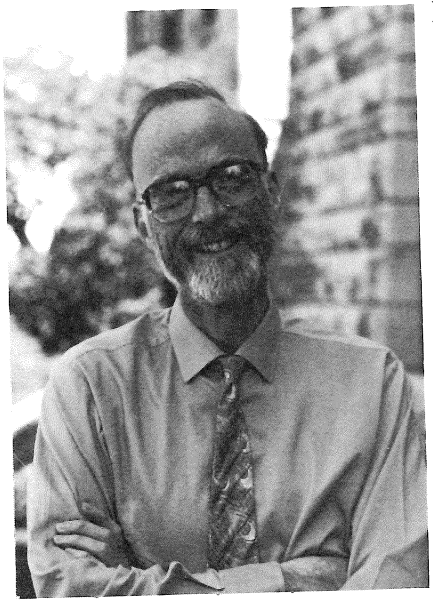
Bradford G. Blaker Library Dedication

The dedication of the Department library in the name of Brad Blaker took place on February 24, 1989. The speaker was Bill Scherer, an independent systems-consultant from New Jersey. His topic was the need for quality communication between developer and user in software systems.

There is some good news concerning the memorial fund established by Brad's family. An anonymous donor has given a commitment to match any new donations to the fund, up to an additional $1,000. If the full amount is reached, the fund would have a self-sustaining principal. The Department library is not funded by state monies and a portion of the donations may be used to help support the library. Any persons interested in contributing may use the form in this newsletter and indicate that the funds be earmarked for Brad's memorial fund.

Department Visitor: C.A.R. Hoare

Last May, the Computing and Information Sciences Department was visited by one of the most distinguished researchers in computing, Professor C.A.R. Hoare, Professor of Computation, Oxford University, England. Professor Hoare attended a workshop sponsored by the Department, met with faculty, and presented his research. C.A.R. Hoare is famed for the variety and quality of his contributions to computing. He invented the "Quicksort" sorting algorithm, helped design the Pascal data typing system, formulated the "monitor" synchronization construct, and established the area of axiomatic programming language semantics. Most recently, he developed the Communicating Sequential Processes (CSP) notation and an implementation based on its ideas (Occam). His book, "Communicating Sequential Processes," was published in 1985. In recognition of his contributions to computing, the Association of Computing Machinery awarded Professor Hoare its 1980 Turing Award.



Professor Hoare's visit came during a 10-day excursion to the U.S. He attended the "Workshop on Categorical Aspects of Data Flow Analysis" at KSU, which was organized by Austin Melton and Dave Schmidt of the Department. Professor Hoare talked about his research on applying category theory to correctness proofs of concurrent systems and he gave a public lecture on applications of predicate calculus to C-MOS design; the latter lecture was part of the KSU Graduate School Distinguished Faculty Lectureship Series.

The workshop attracted a number of other noteworthy visitors. Attendees heard lectures by Stephen Brookes, Carnegie-Mellon University; He JiFeng, Shanghai University; Flemming Nielson, Danish Technical Institute, Denmark; and David Benson, Washington State University.

When asked about the workshop, co-organizer Dave Schmidt said, "It was quite a success; the workshop's participants gained much from Professor Hoare's ideas and presence. Our department's students also benefited from seeing Professor Hoare, a world-class researcher, present state-of-the-art results."

The workshop was funded by Dr. Virg Wallentine, Dean Thomas Isenhour, and Dean Robert Kruh.

Nichols Nugget: Ethics Course Added

Because of their computing expertise, computing professionals have an important responsibility to protect the privacy of individuals, ensure the correct operation of our business, industry, education, and government agencies, and enhance the quality of life in general. To support these goals, the Department has developed a new course, under the leadership of Dr. Maarten van Swaay, entitled "Computers and Society". It is a study of the impact of computer and associated technologies on society including such topics as ethics of computer use, computer fraud, and protection of privacy. In addition, the students study the legal, moral, and public policy-making responsibility of their future profession. While an anonymous donor has initiated a fund to bring in outside speakers to enhance this effort, additional help is needed for this vital part of our curriculum.

Faculty Activities

Faculty members have been extremely productive these past two years. They are establishing international reputations as researchers and they have published 42 articles; they are also providing state-of-the-art education to both graduates and undergraduates - a very busy lifestyle. 84 baccalaureate degrees and 81 MS and PhD degrees have been awarded during the two-year period. In this section we will point out special accomplishments of the faculty.

Austin Melton was granted a one year sabbatical to study Partial Evaluation at the University of Aarhus in Denmark. Beth Unger will go on sabbatical during spring 1990 semester to study Deterrents to Compromise of Information in Data Bases. Dave Gustafson received a NATO grant to travel to London and work with researchers from Iowa State, Colorado State, City University (London), and South Bank Polytechnic University (London) on Software Metrics. Rod Howell, algorithms and complexity, has joined us from the University of Texas at Austin. K. Ravindran, distributed systems and computer networks, has joined us from Bell Northern Research in Ottawa, Canada. Dave Schmidt and Masaaki Mizuno received a NSF grant of $157,000 to continue their research in "Semantics-Driven Compiler Synthesis." The award, covering the period June 1989 through November 1991, supports summer salaries, travel, and computing expenses for the two. A postdoctoral research fellow, Dr. Pascal Fradet from the University of Rennes, France, is also funded by the grant. The goal of the research is to make effective implementation of results developed by Schmidt and Mizuno on programming language analysis. Schmidt has pioneered the use of "single threading" data structure analysis techniques in the consctuction of compilers from denotational semantics definitions in programming languages. Mizuno has developed compile-time/link-time data flow analysis for modular, distributed programming systems. These results are being integrated into the PSI compiler synthesis system, developed by colleaues of Schmidt's at the University of Aalborg, Denmark. Continuing cooperation between Aalborg and Kanasas State is a secondary aim of the project.

Austin Melton and George Strecker were awarded an Office of Naval Research Grant to study Galois connections and programming language semantics; and Tom Isenhour (Dean of the College of Arts & Sciences) and Maria Zamfir-Bleyberg received a NSF grant to study chemical laboratory automation with robots. Maarten van Swaay deserves special recognition for his leadership in creating the Computers and Society course. William Hankley has shown real leadership in the development of both undergraduate and graduate curricula. Finally, Joseph Campbell has done an excellent job in advising undergraduate students (along with many other duties). We now retain more than 80% of our freshmen students.

We have lost three faculty members since the last newsletter. Dr. Paul Fisher is now Department Head at North Texas State, Dr. Richard McBride is at the University of South Dakota, and Dr. Thomas Pittman is working in private industry in California.

Faculty Research Interests

Myron A. Calhoun, Associate Professor
Major Interests: Computer architecture, computer aided design, digital systems design, microcomputer applications.

David A. Gustafson, Associate Professor.
Major Interests: Software engineering methodologies, software physics, validation techniques, AI techniques in software development, expert systems, software testing.

William J. Hankley, Professor.
Major interests: Software Engineering (formal specification languages, verification; direct manipulation graphic interaction), Programming Languages (Ada, object-oriented & logic programming.

Rodney Howell, Assistant Professor.
Major Interests: Petri nets, computational complexity, analysis of algorithms, self-stabilization, real-time scheduling.

Faculty Research Interests, continued

Austin Melton, Assistant Professor.
Major Interests: Denotational semantics, software engineering, programming languages.

Masaaki Mizuno, Assistant Professor.
Major Interests: Distributed systems (concurrency control and recovery, mutual exclusion) and computer security.

Kaliappa Ravindran, Assistant Professor.
Major Interests: Distributed systems architecture, distributed programming languages and high speed networks.

David A. Schmidt, Assistant Professor.
Major Interests: Denotational semantics, applications programming, natural deduction theorem proving.

Elizabeth A.Unger, Professor. Major Interests: Database systems, programming languages, computer science instruction, concurrency, office automation systems.

Maarten van Swaay, Associate Professor.
Major Interests: Computer architecture, microprocessors, instrumentation.

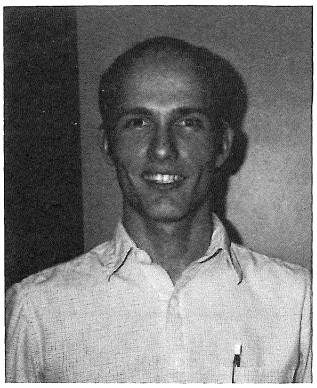
Virgil E. Wallentine, Professor and Head.
Major Interests: Distributed programming systems, distributed discrete event simulation, operating systems, and knowledge-based distributed debugging systems.

Maria Zamfir, Assistant Professor.
Major Interests: Formal methods of concurrency, artificial intelligence, concurrent programming languages.

Visiting Scholars:

Lars Bo Neilsen, University of Aalborg, Denmark, visited Dec. 1988-June 1989 to continue his PhD studies in implementation of programming languages.
Pacscal Fradet, University of Rennes, France, visiting Feb. 1989-June 1990 for post-doctoral research in functional programming languages.
Karoline Malmkjear, University of Copenhagen, Denmark, visiting Sept. 1989-June 1990 to initiate her PhD studies in partial evaluation theory. Funded by Fulbright Scholarship.
Olivier Danvy, University of Paris, France, visiting Mar. 1990-June 1990 to lecture and continue his research on partial evaluation theory.

Graduate Student Profile: Mitchell Neilsen



Mitch is a native Nebraskan and lived in the western part of the state in Sutherland and Paxton. He received his undergraduate degree from Kearney State College in Nebraska in 1982, majoring in mathematics. After college, he taught mathematics at Smith Center High School in western Kansas and also taught adult education computer courses at Central Community College and Cloud County Community College.

Mitch came to Kansas State to pursue a MS in mathematics, completing that degree in 1988. Mitch has a strong interest in computer science and became acquainted with several of our faculty members, so he decided to come to our Department to work on a MS in computer science and to start work in a PhD in computer science. He says that some of the major reasons he selected the Department are the faculty interest in the success of the students and the varied research interests in the Department. He is well along with his computer science MS and should finish late this year. His MS work is in the area of distributed mutual exclusion, concurrency, and recovery. His major professor is Dr. Masaaki Mizuno and they have already submitted a paper as a result of their joint research. When Mitch finishes his PhD, he plans to continue to do research and teach at a university or a large college.

Since coming to the Department, Mitch feels that one of our strengths is the helpful and friendly attitude of the faculty and staff.

Mitch would like to have enough Sun workstations for all the faculty and graduate students (he thinks it may be wishful thinking, but we certainly hope not). In addition, he thinks the Department should continue to support research and especially the sort of teaching that provides the fundamental knowledge that makes research possible.

Graduate Student Profile: Dennis Ng

Dennis is one of our international students, originally from Hong Kong. He is a PhD student and hopes to complete his degree in December of 1990. he started his undergraduate work at the Hawaii campus of Brigham Young University and later went to the Provo campus where he received his undergraduate degree in computer science in 1982. He stayed at Brigham Young for his MS and finished that degree in 1984. His MS work was in the area of form-based query languages.

Dennis selected Kansas State for his doctorate worked because of the central location of our school and because there were several professors here at that time with national reputations in data bases: Dr. Paul Fisher and Dr. Beth Unger. His thesis work is in the area of non-normal-form data base design, working under the direction of Dr. Beth Unger and Dr. Austin Melton. He is also interested in areas that would comprise theoretical foundations of computer science.

After graduation next year, Dennis plans to pursue a researching and teaching career at a university or perhaps a research-oriented position in industry.

When asked to give his views on the good and not-so-good points of the Department, Dennis commented on the friendly study environment, the close teacher-student relationship, and the computer facilities.

Things Dennis sees as needing improvement are an increase in the number of faculty to better handle the teaching and research loads, and more research grants that could support more research assistants. He feels these two things are necessary to promote research activity in the Department to gain national recognition. Other things he would like to see accomplished are increased funding for faculty and GTAs to match peer institutions, funds for journal and conference subscriptions, and acquisition of needed journals for the Department Library, especially in the data base area.

Graduate Student Profile: Cindy Cook

Cindy is a Kansas City native and has done all of her formal computer science studies at Kansas State. She finished her undergraduate degree in 1989 and then decided to stay with us for her MS degree. She has quite a lot of practical work experience, having worked for Computing and Telecommunications Activities (Computing Center to our non-recent graduates) for most of her four undergraduate years.

When Cindy was in her senior year, she was working with Dr. Maria Zamfir-Bleyberg and through that experience Cindy was offered an assistantship to continue her studies in the MS program. She lists that opportunity as a major reason in her decision to stay at Kansas State, plus familiarity with the school influenced her thinking.

Dr. Zamfir-Bleyberg continues to be Cindy's major professor and her research is working toward a semantic data model using KEE on the SUN workstations.

After Cindy completes her MS, she would like to work in industry and try to get a feeling about what is really needed by the general population that can be provided or improved by the use of computers. She would then like to return to school to work toward a PhD, and do work that has practical as well as theoretical value.

Like our other graduate students, Cindy believes a major strength of the department is the friendly attitude of the faculty and their willingness to talk to students. Cindy would like to see the Department be able to expand and strengthen our data base course offerings and research. She feels that the Department needs to project a more positive image in that area, and students need to see the opportunities that are available in that large employment area.

Department Scholarship Winners

Troy Anderson is one the IBM Employees Scholarship winners this year. He is originally from Osborne, Kansas and is a junior majoring in Computer Science and Information Systems.

Troy has managed to find the time for numerous activities here at K-State and be an outstanding student. He is on the Residence Hall Governing Board, the Residence Hall Floor Government, and designed and painted a wall mural as part of a floor redecoration project. Troy's attention to studies is evidenced by his selection to Upsilon Pi Epsilon, Golden Key, and Outstanding College Students of America. He is a State of Kansas Scholar and is on the Dean's Honor list. His plans include attending graduate school.

In his scholarship acceptance letter, Troy emphasized the importance of industry support to help students reach their goals. The Department certainly echos those sentiments.

Teresa Detter, the second IBM scholarship winner, is an incoming freshman from Concordia, Kansas and plans to major in Computer Science and mathematics. She was the Valedictorian of her class, a Governor's Scholar, State of Kansas Scholar, and in the National Honor Society. Teresa has been active in one of the school's service clubs, the Kayettes, and was a member of the concert band, the cross country team, basketball team, and track team.

The Department received a generous scholarship grant from Conoco this year and the Dean of Arts & Sciences matched that amount, enabling us to make several additional scholarship awards for 1989-1990. The following students will receive those joint scholarships.

Jared Friesen is a junior from Hesston, Kansas. He is a transfer from Hesston College and is majoring in Information Systems. He has done extensive programming for Executive Aircraft Consulting in Hesston, helping to install and maintain their local area network. Jared plans to take technical electives in the communications analyst track and graduate in spring 1991.

Chris Thompson is a sophomore from Stilwell, Kansas and is working on a dual major in Computer Science and mathematics. Chris attended Johnson County Community College and Old Dominion University prior to coming to Kansas State. He earned numerous honors while in high school, including National Honor Society and Kansas Honor Scholar. In addition to his excellent classroom work, Chris is a member of the varsity golf team.

Greg Haynes is an incoming freshman from Colorado Springs, Colorado. Greg was the Valedictorian of his class and has been extremely involved in school and community activities as well as earning scholastic honors. Greg is in the National Honor Society, the National Honor Roll, and named one of the Most Outstanding Students for High School Math, to name a few. Greg has developed several programs that are still used in his high school.

Congratulations to all our scholarship winners!

Special thanks to the following companies for their scholarship support:

International Business Machines
Conoco Oil Corporation
Phillips Petroleum Corporation
DST Systems

Summer On Campus Students Donate "Hard Cash"

Since 1980, 50-70 AT&T employees from around the nation have been spending 5 weeks of their summer at KSU, enhancing their technical skills and pursuing a MS in Computer Science in this Department. More than 70 have received the MS degree. In a scenario reminiscent of each member of a family contributing to save the home, in the past two summers these students have contributed more than $7,000 to the Department, while they were still in the program. In a time when funding from the State of Kansas is minimal to support the operation of expensive science and engineering computing labs, we could not make progress toward excellence in instruction and research without this truly "family" style commitment to KSU. This is an open letter of thanks to the Summer On Campus family, past and present.

Yes, I want to help support the Development Fund!

☐ I want to support the Department of Computing and Information Sciences. Enclosed is my check for $_____ made payable to the KSU Foundation but designated to the CIS Development Fund.

☐ I want to pledge my support for the Department of Computing and Information Sciences for:

☐ $500 ☐ $250 ☐ $150

to be paid in _____ installments. Enclosed is my first check for $_____. Please bill me annually for the next _____ years. I would prefer billing in the_____.

☐ Department Library

☐ Faculty and Student Development

☐ Scholarships and Fellowships

This gift ☐ does
☐ does not qualify for a matching gift from my employer.

Date_____Class_____

Name_____

Street _____

City, State, Zip _____

Authorized Signature_____

Business or employer_____

Please return to KSU Foundation, P.O. Box 1806, Manhattan, KS 66502.

The Computing and Information Sciences Development Fund

Private funding continues to be critical to the success of the program, the faculty and the students. We still have three major categories which we belive to be primary to the advancement of the Department. First, the university library has sustained major reductions, forcing the cancellation of many journal and proceedings subscriptions. We have put as many resources as possible into our own library in an attempt to keep current literature available. Second, scholarship and fellowship funding is the best way to attract quality undergraduates and graduates. The "market" is extremely competitive for the bright student. Third, w
e want our students to be exposed to the latest ideas in computing, and to do so we must be able to invite good seminar speakers and support faculty and student travel to seminars. A good number of our graduate students presented papers at conferences the past two years, thanks to your help in attracting quality students and helping to fund their travel.

We established the Development Fund three years ago to help meet our critical needs. If you would like to help us maintain a top quality program, please use the form above. Your employer may provide matching funds. We hope you still consider yourself as part of the CIS Department family and you will want to help with your donation, large or small. We are most appreciative of your support—thank you!

Virg E. Wallentine, Department Head

Nichols Nugget: Get the good word out!

As we all know, the demand for computing professionals is still rising. Most businesses and industries are in desperate need of computing expertise. In spring 1989, three times as many companies came to campus to interview graduates as we had graduates who wanted to interview. The basic problem is that high school students, their parents, and high school counselors seem to think there are few jobs in computing. We need help. If you have the opportunity to visit a high school and talk about your profession, please accept the invitation and give the students an opportunity to hear the truth; we work in an exciting field.

The Department of Computing and Information Sciences
234 Nichols Hall
Kansas State University
Manhattan, KS 66506

Keeping Track

We're interested in you! Please take a moment to fill out the information form below and return it to us.

Name_____ Street Address_____
City, State, Zip_____
Year Graduated_____Degree_____Current Company_____
My job or position_____
Questions for the Dept. or alums I would like to contact:_____
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