Department of
Computing & Information Sciences

A newsletter for the
Department of Computing & Information Sciences
Kansas State University
234 Nichols Hall
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Castle Computing

Vol. 1, No. 3
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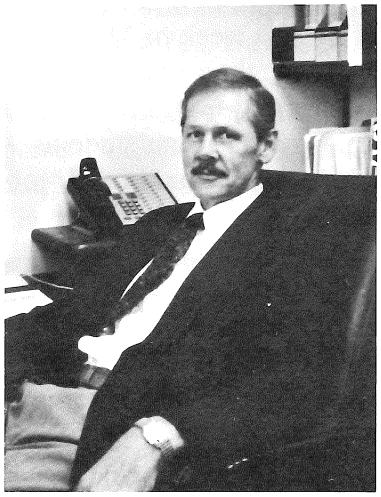
Greetings from the Department Head



I want to open this greeting with a "thank you" for your support of the Department. Some of you have contributed funds; some have helped recruit new students; some have helped in acquisition of equipment; and some have spread the good word about KSU. All of you have been friends to KSU and we thank you.

Because of your interest in the quality of education and research in CIS at KSU, you are de facto members of the Castle Computing Club; and in this edition of "Castle Computing" we will try to give you a perspective on the Department, its people, and its missions. Special emphasis is placed on the accreditation process for our Bachelor of Science degree in Computer Science, a definition of computing sciences, the alumni support for the program, the wide variety of activities of the faculty, the cadre of distinguished visitors to the Department, our students, and our computing environment.

Each year holds both promise and peril. This past year we again were renewed through the bright, inquisitive students who continue to enroll at KSU. Our successful alumni reflect the quality of students who attend KSU. The faculty have been dedicated to imparting fundamental knowledge and providing students experience in problem-solving and critical thinking. The faculty have been very successful in research, both in extramural funding and in publication of their research results. I applaud their efforts and success. This year has also seen further decline in state support for education and research. Budget cuts threaten the quality of both research and instruction. Large class sizes and less-than-adequate laboratories are indicative of a total lack of state support for acquisition and maintenance of computing facilities in a discipline

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which utilizes an experimental and engineering instruction paradigm as well as theory.

Old Nichols Hall (Castle) (Gym) seems an appropriate mixture of medieval exterior with a "high tech" interior to represent the blending of the past of KSU and the bright future of our Information Age. Thus, we have scattered throughout this newsletter little facts about the Department, the University, the building, and the people called Nichols Nuggets. If you have a cherished memory, I invite you to forward it to us for publication in the next issue of the newsletter.

I hope this letter is informative, and please stop back and see us. Also, please keep us up to date on your activities. We would like to publish recent activities of our Castle Computing Club members in the newsletters. Thank you again, for being a friend.

Department Seeks Accreditation

The Department has decided to seek accreditation for the Computer Science Major- Bachelor of Science degree program. The Information Systems Major will be unaffected. This accreditation will be done by the Computing Sciences Accreditation Board (CSAB), located in New York City. This will be a detailed look at all aspects of our CS/BS program. CSAB considers such things as total enrollment in the program, university enrollments, structure of courses, time devoted to different topics in a course, samples of student work in each course, how we fit the ACM guidelines, qualifications of professors, and University support. To date, we have requested and been accepted for examination this year. The preliminary volumes of reports and forms were submitted the last week of May. The accreditation team made their visit in October. We feel confident that our program will pass this rigorous examination and that our students will benefit, both while in school and in their job search.

Soviet Researchers Visit the Department

Perhaps the record for "most distance travelled" by a visitor to the Computing and Information Sciences Department was set in January by two researchers from the USSR's Institute of Informatics Systems, in Novosibirsk, Siberia.

Drs. Ludmilla Cherkosova and Mikhail Bulyonkov visited the Department for three days to meet with Departmental faculty and to continue ongoing research projects with staff. Cherkosova, who studies properties of Petri nets and concurrency, met with Rodney Howell; Bulyonkov, who is an internationally known expert in partial evaluation theory, held discussions with Olivier Danvy and Karoline Malmkjaer. Both visitors presented public lectures during their stay.

The two compared their experiences in academic life to those of faculty members here; many aspects — teaching, reasearch work, deadlines, supervising— appeared the same. But all agreed that the climate of Kansas was somewhat preferable to that offered by Siberia.

Surprisingly, the two Soviets planned their visits to the department independently, learning of their common destination only when they both attempted to book air travel from Novosibirsk to Kansas City.

Following her stay at Kansas State University, Cherkosova journeyed to the University of Texas, where she resides as a visiting guest professor. Bulyonkov proceeded to Florida, where he attended a national computing conference.

Faculty Profile: David Gustafson

Dave started his university work at the University of Minnesota, earning a BS in mathematics in 1967. Dave continued with graduate school in mathematics, but stopped to join the Air Force. While in the Air Force, Dave earned a BS in meteorology from the University of Utah and served four years as a weather officer. Dave then returned to graduate school and earned a M.S. and Ph.D. in computer science from the University of Wisconsin, Madison.

Dave joined the Department in 1977 when it was still located in Fairchild Hall.

Dave has been involved in software engineering since graduate school. One of the first courses Dave taught at KSU was CIS 740 Software Engineering. Although the articles covered and techniques discussed have changed, the call for more formalism that was issued in the first class is still emphasized in the current class.

In the late 70s, Dave and Bill Hankley proposed a required undergraduate software engineering project course. The result was the present CIS 540/541 sequence which Dave has taught since 1984. After years of drawing diagrams by hand and on Macintoshes, the CIS 540/541 students will be using a CASE tool in the Fall 1991 semester.

Dave has authored a variety of journal and conference papers within the area of software engineering including testing, measure, and

maintenance. Dave was a co-author on the 2nd Edition of Compiler Construction and is currently working on the 3rd edition with William Barrett.

Dave is a member of the grubstake group - a group of measure researchers who want to establish theoretical foundations for software measures. The group includes Austin Melton, Albert Baker (Iowa State), James Bieman (Colorado State), Robin Whittey (Southbank Polytechnic-London), and Norman Fenton (City University-London).

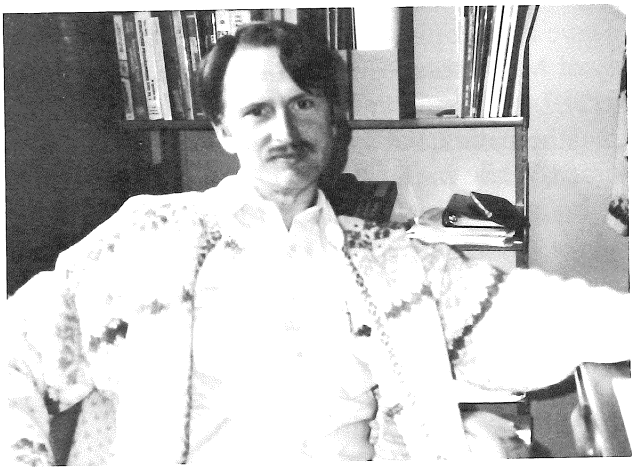
Dave and his wife, Karen, have three children, ages 14, 19, and 22. The whole family is active in their church and Dave is currently on the church council.

Nichols Nugget: The Pools of Nichols

The swimming pools in the original Nichols make an interesting story, especially to high school students visiting the Department. The original building had two pools. The reason was at the time the building was constructed, there had to be separate pools for men and women. Swimming classes were "in the natural state", till swimming suits became popular for women, sometime in the 1920s. This little bit of Nichols history never fails to cause some interesting reactions from visitors.

The swimming pools were probably the main reason Nichols was saved at all. When the building burned, it would probably have been razed immediately, but the pools could still be used. When the new natatorium was built, the plan was to tear down Nichols, but by then the students had organized enough pressure to save the structure. Their petitions and pressure eventually convinced the legislature to allocate funds for the "New Nichols Hall".

Faculty Profile: Austin Melton



Austin's first real involvement in computer science was in a numerical analysis class. He was teaching mathematics at Marshall University in West Virginia, and in the numerical analysis class he and the students wrote programs which would calculate answers for many of the problems.

Austin says this "teaching" of programming was instrumental in getting a teaching position in the Computer Science Department at Wichita State in 1982. At that time there was a shortage of computer science faculty members, and because of this shortage and his limited background, Austin was offered a computer science position - with the provision that he audit three computer science courses during his first year. It was while teaching at Wichita State that Austin began two practices which have been extremely helpful in his development as a computer scientist: he volunteered to teach many new classes and he worked with good graduate students. His research in software engineering began by working with graduate students who had interests in that area. This research area has now grown to include joint work on an international scale and to research in databases, including work in fuzzy databases.

Since joining the Computing and Information Sciences Department at Kansas State University in 1984, Austin has had many opportunities to be involved in the development of computer science - development at a departmental level and at an international level. While at KSU, Austin has traveled and worked with researchers in England, Germany, and Denmark. Those joint research efforts have included work in software engineering, database theory, and programming languages. Also, with the support of the Department, Austin was instrumental in starting a series of international conferences and workshops. The series is called Mathematical Foundations of Programming Semantics. This year the seventh meeting in the series will be held at Carnegie Mellon University. These meetings regularly attract some of the very best international researchers in computer science. The series seems to have aided in the development of theoretical computer science by bringing together computer scientists and mathematicians so that together they can formulate and solve important theoretical questions in programming languages.

Austin says that in the last three to five years especially, we have begun to grow and develop into a research-minded Department. One of the benefits of this "research-growing" includes better classroom instruction - our students can work and study with people who are actively involved in the continuing development of computer science. Austin hopes that this trend will continue so our students can be well prepared to face the new challenges that are continually arising in computer science and so our Department can play a role in the shaping of the future of computer science.

Dr. Beth Unger Promoted

Dr. Beth Unger has been promoted to the position of Associate Dean of the Graduate School. She will remain in the Computing and Information Sciences Department on a half-time basis. She assumed her new duties August 18, 1990.

Congratulations to Dr. Unger and we wish her well with her additional important responsibilites.

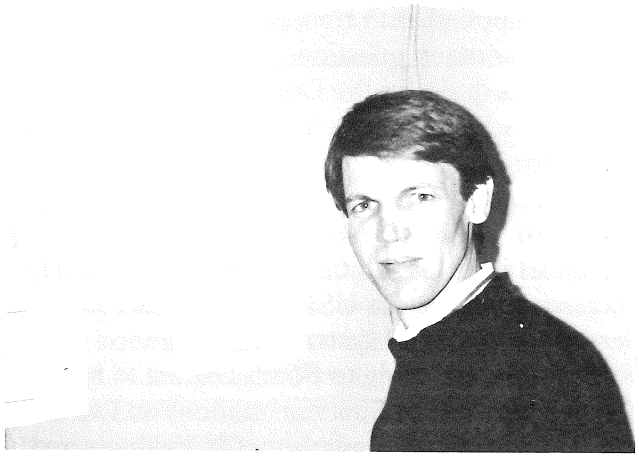
Staff Profile: Harvard Townsend

Harvard has been at Kansas State since 1977 and with the Department since June, 1981. Harvard has a Bachelor's degree in Wildlife Biology from KSU, and he still thinks biologists have more fun. But he also knows that computer professionals make more money, so he jumped ship in 1981 to pursue his MS degree here at KSU. At that time, he taught Chemistry I labs in the Chemistry department to help make ends meet, moving next to grading papers for good ol' CMPSC 300, then finally teaching CMPSC 207 for CS majors at 7:30AM five days a week. Needless to say, that was not the most popular section in the line schedule.

With the graduation of the previous system administrator, Carlos Qualls, Harvard made a decision in May, 1983 about which he has no regrets. He decided to stay in Manhattan in the Computer Science department and pursue system administration as a career. It was not an easy decision since by then he and his wife, Dana, had two children and job offers from the likes of AT&T Bell Laboratories trying to lure them away to the big city and big money. But, with the quality of life and a young family in mind, they chose Manhattan and less money instead.

During Harvard's tenure in the Department, he has seen a lot of systems come and go. Who can forget that fine Interdata 7/32 with the OS/32 operating system? Or the Interdata (later Perkin-Elmer) 8/32 running version 7 UNIX with 2.8 BSD additions, 32K (yes, "K") memory boards, 5 and 10 megabyte removable disk platters, and its daily crashes? Or the Perkin-Elmer 3220? Or the Plexus P/60s? Or the Columbia Data Products PCs? Or smashing the VAX 11/780 front panel into the door knob while trying to force it into Fairchild 117? Or sharing an office with Joe Campbell in Fairchild Hall? Ah, the good old days. Who wants 'em?

Harvard's official title is "Systems Analysis and Programming Manager." This translates into "do whatever it takes to keep the systems running as smoothly as possible." Working with the computer engineer, Earl Harris, Harvard is responsible for the day-to-day operations of all the computer systems in the Department, especially as it relates to software and the end-users.



This constitutes a wide variety of tasks on a wide variety of computers with a wide variety of people - which is indeed part of the attractiveness of his position, there is always something to do.

So just what does Harvard spend his time doing? Probably his favorite thing to do is to talk to sales people (just kidding), which he has to do frequently as he helps plan the future of the computing facilities in the Department.

Besides keeping up with the ever-changing technology, Harvard spends a lot of time answering questions and helping users. He has provided help to a lot of graduate students with their projects, given many seminars both in the Department as well as for student and professional organizations, and written a lot of documents describing our facilities and how to use them. He must also deal with security violations such as the infamous Internet worm that hit our VAX 11/780, several viruses on the Macintoshes, and an occasional over-zealous student who abuses their privileges.

In the good ol' days he even did a lot of programming, working on projects such as the Modula-2 compiler, accounting programs, printer error deamons, and lots of shell scripts for handling a variety of system administrator tasks. Now he manages four systems programmers and analysts who do the REAL work. Under Harvard's supervision, these four students take care of such important tasks as backups, bug fixes, software installations and upgrades, porting software to new platforms, developing new software, and keeping the

Harvard Townsend (continued)

printers supplied with ribbons and paper. They also answer many questions from the users. Besides his duties in the Department, Harvard also regularly consults with companies that have a need for his expertise. He spent several weeks in Washington, D.C. several years ago training the Metro (public transportation) computer personnel in Unix and C. He has trained over 200 employees of the USDA Soil Conservation Service in Unix and system administration and will soon be traveling to South Dakota to help set up a network of Sun workstations and servers. He has helped a number of individuals and small businesses here in Manhattan, and just finished a very large C project that is being used by a local agricultural firm (it is also being used in Brazil and will soon make its way to Canada).

Although it may seem like Harvard has a lot to do, it is actually hard for him to find time to work. First of all, he takes his family responsibilities quite seriously, with calls for time helping his wife at home, spending time at his children's grade school, watching gymnastics or soccer or whatever, putting together puzzles, playing catch, taking vacations (that's important), etc. He is also very active in the Church of Christ here in Manhattan where he is a deacon. And on any given day, rain or shine, hot or cold, you are likely to see Harvard pounding the streets, paths, or pools of Manhattan in preparation for the next running race, bike race, biathlon, or triathlon. He and his wife have become serious addicts of exercise and particularly enjoy racing, either individually or as a team. Harvard's main goal is to keep at least one step ahead of Dana, and is just barely attaining that goal. However, Dana is the one who brings home the trophies while Harvard only brings home tired muscles.

So what are Harvard's hopes for the Department? He has two which are related. He would really like to see improved computing facilities for the undergraduates. With the addition of Sun workstations and X Window System display stations in the Department, the faculty and graduate students are well-equipped to move forward in their research and instruction. The undergraduates, however, do not have adequate access to these facilities simply because funding is not available. They are left to contend with slow, out-dated technology. This problem leads to Harvard's other hope for the Department - adequate funding. One of his biggest frustrations is having to do so much with virtually no budget for hardware and software. It is a testimonial to Earl, Harvard, and the systems staff that we are able to have such extensive, reliable computing facilities with such little financial support. As our Department and computer science in general matures, Harvard hopes that the University's commitment to this discipline will grow accordingly.

Computer Labs

Fairchild Hall is now in the process of being remodeled to make it accessible to physically limited students. There will be an elevator and stairs installed in the southeast part of the building. The center staircase and the open area we laughingly called the "Fairchild picnic area" will be converted into storage and restrooms. In anticipation of this change, the old PC labs that were in the basement were moved to room 202 last fall.

Within the next year we will be converting the basement of Nichols to computer labs. The basement is currently used as book storage for the library. Foundation has purchased the old Farm Bureau building on Anderson Avenue and will turn part of it over to be used by the University. The books will be moved to that facility, opening space for new teaching computing labs, GTA spaces, and experimental computer labs.

Computer Science Grantsmanship

Few people realize that over one third of Kansas State University's operating expenses are paid by money from research grants from government and industry. Within the Computing and Information Sciences Department, grant money pays for systems staff, secretarial support, graduate research assistantships, postdoctoral positions, computing equipment, and even library subscriptions. The Department as you know it would cease existence without grant monies.

How does a faculty member obtain a research grant? Although the procedures vary from organization to organization, the system used by the National Science Foundation (NSF), the US government's grant agency for the sciences, is typical: a written application is made, the application is reviewed by experts, and an award is given to a high quality proposal.

An application for a grant is called a *research proposal*. The proposal describes the goals of a proposed project, lists prior results that the proposer has completed in the subject described in the proposal, and suggests a budget for completing the project. A typical proposal describes a project of two years in duration and requests, say, $180,000 in funds for researchers, staff, and equipment. About 40% of the requested amount will be given to the University as their "overhead" money for electricity, office space, and paper clips. A quality proposal takes several months of effort to write and is bolstered by years of prior research work in the subject of the proposal.

The proposal is then submitted to the National Science Foundation; six to eight months pass before a decision is returned. During that time, experts in the proposal's subject area study the proposal and submit written reviews. Based on the reviews, NSF decides whether to fund or refuse the proposal. A funded proposal is monitored by the agency; periodic progress reports are required. Upon termination of the project, a final report, listing results, software, patents, and research publications, is required.

During the past three years, faculty in the Computing and Information Sciences Deparment have received research grants from NSF, the Office of Navel Research, AT&T Laboratories, and the Kansas Technology Commission, for a total of more than one million dollars. Although the energy involved in grant writing, researching, and reporting is significant, the results well repay the efforts.

News From the Job Placement Center

The Job Placement Center on campus has undergone some changes this past year with the retirement of Bruce Laughlin. Jim Akin, a longtime assistant director, is now the Director of the Placement Center. The Center has managed to add several people to help students with their job search. Tracey Fraser has been assigned to work with students in our Department, and she also has responsibility for students in Arts & Sciences and Human Ecology. Tracey did her undergraduate and graduate work here at K-State. Her BS was in the College of Human Ecology, then she did her Master's work in Counseling and Student Resources in the College of Education. After doing some work on a grant here at Kansas State, Tracy worked at Highland Community College as the coordinator for Continuing Education in Science and Industry. Tracy has a large student population to serve here, but she has been able to give quality, personal service to our students.

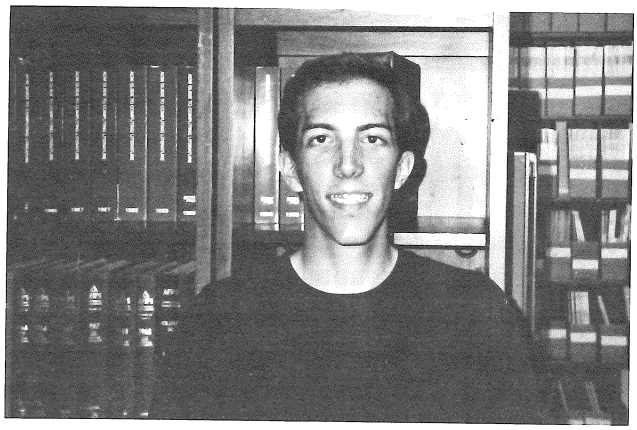
Undergraduate Profile: Greg Haynes

Greg was born and raised in Colorado Springs and has enjoyed the "mountain things", such as skiing, since he was four. Greg had a very successful high school career. He was in a number of honors classes: Data Structures, Calculus, English, and the class yearbook committee. He graduated as valedictorian of his class and was named Most Outstanding Student.

Greg says he chose K-State because of the friendliness of the school and our willingness to recruit out-of-state students. He was also pleased that we want students to start computer science classes as soon as they are qualified, in his case the first semester.

Greg has developed an interest in graphics, micro-computer software development, and programming languages during his time here. He has been busy outside the classroom also - he is currently president of the K-State chapter of Inter-Varsity Christian Fellowship and has become interested in music composition. He has kept busy in the summers back in Colorado Springs doing documentation work for Eagle Picher Industries in 1989 and ARINC Research Corporation in 1990.

After graduation Greg wants to do software design and development, hopefully for large systems, and do some independent programming



for personal computer applications.

Greg thinks the good features of the Department are the consistently high quality of the faculty and our commitment to upgrade our software and systems. He would like to see us improve in the variety of courses we can offer, improved compilers for some languages, and some additional instruction for new students in the use of our utilities.

Greg would like to see the Department work to increase our enrollment and thus be in a position to offer additional electives, for instance a series of graphic classes. Greg feels this sort of variety would allow students to more closely tailor their studies to career goals.

Nichols Nugget: Original Details

Did you know that when the original Nichols Hall was built, it was on the leading edge of construction technology? The main floor was one of the first in the nation to be poured as one continuous slab. Considering the building was constructed about 1912, that was quite an achievement.

Nichols Nugget: Randy Cohen

(Brawn in CIS)

Hey, we can do more than punch keyboards. Randy Cohen, Senior, Information Systems, won the Independent Living Group Arm-Wrestling title in the heavyweight division for the spring '91 semester. Randy then beat the residence hall champ but lost to the fraternity champ in the All-University finals. Randy said his training regimen consisted of no special exercises for the last 5 years. He said the students were probably a little over-confident considering he was at least 15 years older than any of the competition. In addition, Randy describes his body build as something less than muscular. He said he had a lot of fun in the competition and even surprised himself. Congratulations, Randy!

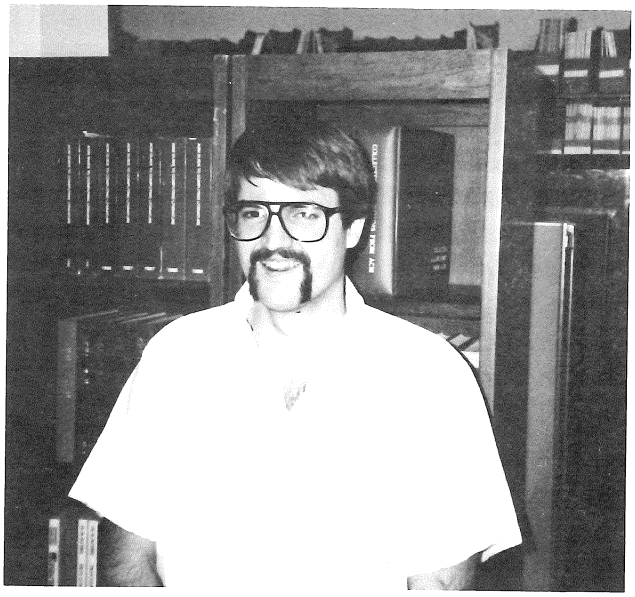
Graduate Student Profile: Clark Sexton

Clark grew up on a dairy farm in the Abilene area and graduated from Chapman High School. He then went to Ft. Hays State University where he earned his BA in Philosophy and was on the wrestling team. After completion of his work at Ft. Hays he was accepted at Kansas State where he completed his MS in computer science, and is currently working toward his doctorate. His doctorate will be in the general area of artificial intelligence, probably in the more specialized area of natural language processing. Clark says he has been in school since he was four years old. We will leave it to you readers to put meaning to that.

Clark selected Kansas State because of recommendations from people he knew and because Dave Schmidt was on the faculty. Fortunately, we were also able to offer Clark a graduate teaching assistantship. Clark has taught a wide variety of courses at Kansas State, including formal logic, beginning Pascal, and data structure courses. In addition to his teaching experience at Kansas State, Clark has taught general logic and bioethics at Ft. Hays State.

After he finishes, Clark might seek a position in research, but he really enjoys the challenge and personal rewards in teaching, so that will be his priority in his job search.

Clark thinks that one of the major strengths of the Department is the friendly and helpful



attitude of the faculty. He likes the general lack of internal politics that we enjoy in the Department. He also thinks the Department has a nice mix of theoretical and practical application interests in the faculty.

As for the future of the Department, Clark would like to see the Department hire more faculty in the artificial intelligence area. He is pleased with the faculty we have been able to hire and the fact that the Department encourages graduate students to give input in the hiring process.

Hacker Tracker Visits Kansas State

Cliff Stoll, professor of planetary science at the Harvard-Smithsonian Center for Astrophysics, gave a very entertaining lecture March 7 titled "Stalking the Wily Hacker." Professor Stoll tracked the West German computer hacker who had managed to break into over forty military computers around the world. He was passing the information to the KGB and his activities lasted for about a year before Stoll managed to pinpoint his location.

Professor Stoll addressed the techniques used by the hacker and Stoll's method of tracking the criminal. He also explained some of the holes in our current systems and how one might trace another person across international networks.

Nichols Nugget: Original Details

Nichols was first constructed as a ROTC drill hall, hence the "castle" appearance, a popular style at the time for military drill halls. The original building featured an elevated inside running track, one of the first buildings in the United States to have such an innovation.

Graduate Student Profile: Thenmozhi Arunan

Thenmozhi is from Madras, which is located in the southern part of India. Her native language is Tamil, one of the oldest of languages and one that is very rich in literature.

Thenmozhi explains that most students in India, unlike many in the United States, don't pursue jobs until they have completed at least a bachelor's degree. Thenmozhi completed her Engineering bachelor's degree in 1987 at Anna University, Madras. She then worked for Hindustan Computers Limited (HCL). HCL is India's largest computer company and it also has a branch office in California. The United States operation is principally involved in marketing of HCL systems and in developing software for American companies.

Thenmozhi wanted to pursue her graduate work in a field related to engineering training and decided on computer science because she was interested in system software. Kansas State offered many of the courses in which she was interested, so she decided to pursue her work here.

Thenmozhi is currently working on her MS degree and expects to complete her work in December 1991. Her major professor is Dr. K. Ravindran and her research area is in high speed packet switching networks. Thenmozhi also has a strong interest in operating systems and computer graphics. After graduation, Thenmozhi plans to work for a company that specializes in computer networks.

Upsilon Pi Epsilon Honor Society

Kansas State's Alpha Chapter of Upsilon Pi Epsilon, the only National Computer Science Honor Society, is well into its fourth year of "re-existence." After several years of dormancy, the first chapter of UPE in Kansas has reorganized, and has been steadily increasing its membership ever since.

During the last few years, UPE has undertaken several projects as a means of fulfilling its obligation of service. One recent effort involves UNIX consulting services for students working in our main computing labs in Nichols. For those students unfamiliar with the UNIX operating system environment, attempting even the simplest of tasks can seem impossible. UPE chapter members offer assistance and answers to those frequently asked questions. UPE has also sponsered a plant trip to NCR in Wichita, and has participated in the Telefund project of the KSU Foundation to raise funds for the Arts & Sciences College and the Department.

This year we are excited about the creation of a Student of the Month award. As an honor society, we look forward to acknowledging those undergraduate and graduate students who lead successful academic and extra-curricular lives. Students may either complete an application for themselves, or they can nominate someone they feel deserves the award. Faculty are encouraged to offer nominations as well.

UPE is also involved with the University Open House activities again this year. We will be sponsering an information table in Nichols to help introduce UPE to CIS students who are unfamiliar with the society, and plan to arrange several displays and demonstrations in Nichols Hall.

Officers this year are: Charles Black, President; Steve Monical, Vice-President; Jeff Brogden, Secretary/Treasurer; and Troy Anderson, Historian.

Department Job Fairs

This past fall the Student Chapter of the DPMA sponsored "Job-Fair Wednesdays". A different company set up displays in Nichols atrium each Wednesday and spent the day visiting with students on a informal basis. The companies represented last fall were Boeing Computing Services, Conoco Petroleum, Mutual of Omaha, and Southwestern Bell.

Feedback from the companies indicates this is a valuable way to keep the company name in front of the students.

This fall we have commitments from Cerner Corporation, Conoco Oil, Kemper Services, Payless Shoes, Mutual of Omaha, Santa Fe Railroad, and Southwestern Bell.

Placement of our graduates has been very successful the last several years, and the Department Job Fair is but one more example of our commitment to our students.

The CIS Faculty - A Busy Bunch

According to the statistics Virg collected as part of this year's faculty evaluations, the average faculty member had the following production:

1. published (or had accepted for publication) 3.5 articles and submitted 3.7 articles,

2. wrote 1.5 proposals for extramural funding (resulting in a Department total of approximately $400,000 of extramural funding, 30% of the total Department budget),

3. taught 3.1 classes (with an average TEVAL score of 3.7 at the 300/400/500 level, 3.61 at the 600/700 level, and 4.0 at the 800/900 level),

4. was a major professor for 5 graduate students,

5. served on 2.5 departmental and university committees, and

6. was involved with at least 20 other activities such as preliminary development and grading, reviews for outside agencies, talks at other universities, professional society service, supervision of GTAs, facilities acquisition, participation in readings classes, guiding graduate seminars and projects, membership on supervisory committees, advising student groups, advising students, and community service.

Nichols Nugget - Sports in Nichols

Nichols has a long and sometimes wacky history of sports, especially in basketball. The building was used for varsity basketball until 1950, when Ahearn was opened for play.

After World War II (the big one), the returning veterans using the GI Bill swelled the ranks of students, and Nichols became extremely packed for the basketball games. So much so in fact, that students were sold different colored tickets, green tickets went on "green nights", red on "red nights", and so forth.

Students were actively demonstrating for a new fieldhouse, and usually carried signs to that effect when attending the games in Nichols. As a matter of fact, students actually sat in the rafters of Nichols to watch the games.

The protests came to a head in the 1945-46 season at the KU game. This was also "legislators night", and all the Kansas Legislature had been invited. The students dressed a mannequin and put a bottle of catsup in its clothes. While the players were being introduced, the students dropped the mannequin from the rafters to the floor. According to eyewitnesses, the result was dramatic, to say the least. In any case, shortly after that incident, the Kansas Legislature allocated money to build the new facility, Ahearn Field House.

Where are they now?

We thought you might be wondering where the faculty who have left the department are living and working now.

Paul Fisher is now the Head of the Computer Science Department at North Texas State, Denton.

Richard McBride is in the Computer Science Department at South Dakota University, Vermillion.

Roger Hartley is in the Computer Science Deparment at New Mexico State, University Park.

Rod Bates is employed by Boeing Military Airplane and lives in Wichita.

Tom Pittman is developing his own company in California.

Ed Basham is semi-retired and living here in Manhattan.

Richard Sincovec is with NASA in California.

Fred Maryanski is now at the University of Connecticut.

Linda Shapiro is at the University of Washington in Seattle.

And new faculty. . .

Jan Chomicki

Jan was born and lived in Warsaw, Poland until 1984. He received his MS in Computer Science from Warsaw University in 1979, and later came to the United States and finished his Ph.D. at Rutgers University in 1990.

Jan says his main interests are in the applications of logic to databases and in dynamic aspects of data bases. His current research includes non-standard query answers in deductive databases, termination and complexity of logic programs, dynamic integrity constraints, and active databases.

He says he finds the atmosphere in the Department very congenial and conducive to research. He would like to see the number of PhD students increase so there would be a few more in each of our PhD level courses.

Jan is married (Wanda) and has three children.

Olivier Danvy

Olivier is from Paris, France and did his undergraduate work at the Universite' de Haute-Normandie, Le Havre, 1981, and his MS and Ph.D. at the Universie' et Marie Curie (Paris VI), France, 1983 and 1986. He was a post-doctoral scholar and assistant professor at the University of Copenhagen, Denmark from 1986-1989. He was a visiting assistant professor at Indiana University in Fall 1989, and a visiting researcher at Stanford University in spring 1990.

Olivier says his major interests are formal semantics and implementation of programming languages, Scheme and functional languages, self-applicable partial evaluation, computational reflection, continuations, abstract interpretation, and concrete mathematics.

Gurdip Singh

Gurdip is our newest faculty member. He was born in Jalandhar, India and lived there until 1986 when he came to New York to work on his advanced degrees.

Gurdip earned his BS in Computer Science from the Indian Institute of Technology, New Delhi. He then came to the University of New York at Stony Brook where he earned his MS in Computer Science in 1989, and his Ph.D. in 1991. His PhD work was under the direction of Professor Arthur Bernstein.

Gurdip is interested in design and analysis of distributed protocols. Most recently, he has been working on a compositional technique for designing distributed protocols. The technique allows many complex protocols to be designed from protocols performing simpler activities. He is also interested in distributed algorithms for network control. He has designed algorithms for leader election, constructing a minimum spanning tree, and breadth-first numbering.

Gurdip is married (Harleen) and enjoys the smaller-city atmosphere. He says he finds the environment at K-State very friendly and conducive for research, and finds this a pleasant change after living close to Manhattan in New York.

Gurdip enjoys playing tennis, swimming, and reading history books.

Generous Summer on Campus Students

Since 1980 the Department of Computing and Information Sciences has been offering a Summer On Campus program for AT&T computing professionals who are seeking an M.S. in Computer Science. Each student spends five weeks on the KSU campus each summer until they have satisfied the requirements for the M.S. degree. This takes four or five summers, dependent upon credits transferred from other universities. Each student enrolls in two (3 credit) graduate level classes for that five weeks, for which they spend four hours per day in the classroom. Time outside of class is spent in private study and laboratory programming problems- in which a ten to 14 hour day is not unusual! The goals of this program are:

1. to enhance the technical skills of computing professionals in the central areas of computing sciences, including algorithms, software engineering, data base systems, languages, computer architecture, computational engineering and science, artificial intelligence, and expert systems;

2. to give the students a breadth of knowledge of computing sciences which permits them to acquire a Master's degree in Computer Science.

It is not "all work and no play", however. Picnics, nights in Aggieville, time at the "rec complex" and the final banquet are good social occasions. Being away from their families, these AT&T student-employees form their own SOC family. We enjoy the kinship of the KSU and SOC families and they obviously feel the same way. Each year since 1986 these students (while still in the program) have donated to the Department, for a total of $17,000. This is much appreciated and these funds have been put to good use to acquire equipment that benefits both the SOC program and our regular on-campus programs.

All I can do is to say again "Thank you for being a friend" to CIS at KSU.

Computing Sciences as a Discipline

Computing is a relatively new discipline (when compared with the traditional disciplines such as mathematics, physics, chemistry, etc.), but we have reached a stage in the development of our discipline where it has become important to define computing. In the early years (40's and 50's) our emphasis was on programming systems and languages. As the 70's evolved more theoretical emphasis resulted in a strong foundation for computing. In the 80's we struggled to define our areas of endeavor. The result of this effort is an understanding of our discipline as having three paradigms of research and instruction. First, we have theoretical foundations where we prove theorems about computational objects. This is very much in the mold of pure mathematics. Second, we develop models of computing processes and experiment with their performance and correctness. This is the experimental science model. Finally, we build real systems in the vein of engineering. All three are important if we are to help solve information-intensive societal problems.

In addition to defining the discipline, we have also come to understand the importance of our research work to other areas. Fundamentally, we must seek ways to integrate computing technology into the process of solving grand challenges. We must become "relevant" and help industries in this country be more competitive in the global technology marketplace. This is the fundamental notion behind the High Performance Computing Initiative before the U.S. Congress.

Even though we have formed a generally accepted view of computing as a discipline, we are still in the early stages of our development. We are excited about the contributions we can make to society and we are striving to equip students with the computing and information technology and research skills to make these contributions .

Faculty Research Interests and Current Projects

Current research programs of the CIS faculty research in the Department can be categorized in five basic areas: programming languages, software engineering, knowledge engineering, database systems, and parallel and distributed systems. Within these broad categories, the faculty are carrying on specific research programs.

Maria Zamfir-Bleyberg, Ph.D., UCLA. In the area of parallel computing, her goal is to develop a language for writing and testing formal specifications of parallel distributed systems based on the AND/OR net model. The AND/OR net model is an initial algebra semantics model for concurrent computing systems, which she has been working on for the past few years. She has also been examining Petri nets as object-oriented systems in which abstract data types provide values for attributes. She has been using this view of Petri nets to define an abstract operational semantics for them based on "reflection". Finally, she hopes that the study of neural networks will open new directions in her research in the area of parallel computing.

Myron A. Calhoun, Ph.D., Arizona State. He is trying to delve deeply into the uses of Finite Inductive Sequences (FIS) as described by Fisher & Case. FIS appears to be directly applicable to the compression of textual data as well as compressing, processing, and recognizing visual images; this latter may also include applications in mobile free-ranging robotics. His ongoing research emphasizes the application of computers to real-world problems such as the development of computer interfaces for the handicapped and low-cost packet-radio networks.

Jan Chomicki, Ph.D., Rutgers. He is mainly interested in the applications of logic to databases and in dynamic aspects of databases. Logic can serve as a query language and as a language for specifying integrity constraints. In this way, the functionality and the application scope of database management systems can be considerably expanded. His current research projects include: non-standard query answers in deductive databases, termination and complexity of logic programs, dynamic integrity constraints, representation and processing of temporal information, and active databases. His research has theoretical and practical components and he is very interested in seeing some ideas implemented.

Olivier Danvy, Ph.D., Universite' Marie Curie (Paris VI). His research interests include the semantics and implementation of programming languages and program transformations. In particular, he is interested in the representation of control in a computational system as continuations, and by their correspondence with extensional theories such as category theory, types, and logic.

David A. Gustafson, Ph.D., Wisconsin-Madison. He is currently investigating models of the software structure that can be used to develop a software reliability model. Related to the area of reliability is the area of software testing methods. He is developing more thorough test methods that have formal bases. Another area in which he is involved is formal notations for diagrams, both data flow diagrams and hierarchy diagrams. The creation of better notations will allow more formal work on transformations of the diagrams. Finally, he is working on developing notations for describing the software development process in terms of the documents that are produced.

Rodney Howell, Ph.D., Texas-Austin. In the area of real-time scheduling, he has been looking at the complexity of finding valid schedules for various types of recurring real-time task systems. Regarding self-stabilization, he is examining various theoretical limitations for self-stabilized systems. For example, he has recently explored situations in which certain types of models cannot simulate other types of models while preserving self-stabilization. And in the area of Petri nets, he has been examining the computational complexity of various problems, such as reachability, boundedness, equivalence, liveness, and fair nontermination. His main goal in this area of research is to tighten the known bounds of the reachability problem for Petri nets.

William J. Hankley, Ph.D., Ohio State. His research is on formal specification of programs, with a current focus on object-oriented and

modular structure (using ADA concepts), high level data types (sets, maps, sequences as in VDM), logic specifications, (predicate calculus and Prolog notations) and temporal description of task behaviors (temporal logic). He is doing related work in verification of specified system properties, development of executable specifications as program prototypes, and use of direct manipulation interfaces for rapid development of prototypes.

Austin Melton, Ph.D., Kansas State. His current work and interest includes using category theory to understand and explain programming semantics, and further he is interested in seeing how category theory itself can be used as a programming language. He is also doing work in software engineering where his work involves trying to develop a foundation upon which a person can with confidence design and define useful software measures. His work in databases involves working on a general method for defining and studying non-normal forms of structures.

Masaski Mizuno, Ph.D., Iowa State. He has worked on process synchronization problems in a distributed computing environment. His group has developed various efficient mutual exclusion and AND-synchronization algroithms. Currently, his group is studying quorum based protocols. They have developed a quorum composition algorithm, which enables efficient construction of "good" quorum structures under a large set of nodes. Recently, he has strarted research collaboration with Professor Michel Raynal of IRISA, based on their mutual interest in process synchronization. They have developed a method to measure the amount of synchronizatation delay and the degree of concurrency in parallel programs.

K. Ravindran, Ph.D., British Columbia. He is currently investigating data-driven communication in distributed operating systems to allow fine-grained reconfigurability of services and fine-grained parallelism among functions that compose a server. A second area of current work is the design of a flexible kernel for distributed applications whereby different applications may choose different forms of communication mechanisms to suit their requirements. He is also working on network architectures and protocols to handle congestion control, bandwidth management and packet multicasting in high speed packet switching.

David Schmidt, Ph.D., Kansas State. In past research, he has shown how to synthesize efficient implementation data structures for languages defined by denotational semantics. He and a research student are building a "rapid prototyping" compiler synthesis system based on these ideas. Recently, he has studied the category-theoretical foundations of a denotational semantics variant called "action-semantics". He and a student have developed a sound and complete type inference algorithm for action semantics; the algorithm is being implemented as part of a programming language analysis "workbench".

Gurdip Singh, Ph.D., New York, Stony Brook. He is mainly interested in design and analysis of distributed protocols. Currently, he is working on a compositional technique for designing distributed protocols. The technique allows many complex protocols to be designed from protocols performing simpler activities. He is also interested in distributed algorithms for network control. He has designed efficient algorithms for leader election, constructing a minimum spanning tree, and breadth-first numbering. Finally, he is interested in average execution time analysis of protocols.

Elizabeth Unger, Ph.D., Kansas. The entire thrust of her research program is in the development of security and integrity systems based upon the object-oriented programming paradigm. The work proceeds with two foci: description of the general interface problem, and characterization of the database administrator and user level integrity constraints. The first thrust includes the completion and documentation of the value of natural change for deterrent value on the tracker attacks; the mathematical and statistical characterization of the security value of such change; the security value of change in conjunction with other deterrent methods; and the characterization of information increment given a user data increment. This latter characterization is just begin-

Faculty Research (continued)

ning with Shannon's concept of entropy as the basis for measurement. Such a measure will allow the use of a semantic model to characterize statistically the security risk of releasing data in certain risk environments. The second thrust is concerned with the formal description of one aspect of user level integrity, the temporality. In this thrust, the next steps are the clear definition of user level integrity, the specification of a language in which to specify constraints, and the definition of the architecture of such a system within contemporary operating systems.

Maarten van Swaay, Ph.D., Leiden (Netherlands). His current interests are in laboratory instrumentation and neural networks. In addition to technical areas, he has a strong interest in social and ethical issues of computing, and has developed a course in that area.

Virgil Wallentine, Ph.D., Iowa State. His work centers on what can be distributed, how it can be distributed across multiple processing units, and what properties of the system make it amenable to distribution. He is presently working in the area of Parallel Discrete Event Simulation (PDES) and in methods for debugging distributed programs. Special emphasis is placed on the study of formal language semantics for the time-space model of synchronization and study of temporal behavior of PDES. He has several on-going projects which include the construction of a system which supports a visual programming facility for queueing networks, a performance prediction environment for PDES, and a knowledge-based debugging system for distributed programs.

Seminar Presentations in the Department

This has been an especially productive year for Department seminars. As one can see from the range of topics, there was "something for everyone".

September 27: Dr. Charles Consel, Yale University, "Semantics-Directed Generation of a Prolog Compiler".
October 3: Dr. James Bezdek, University of West Florida, "Non-Standard Clustering Algorithms".
October 25: Susen Even, PhD Candidate, Iowa State, "Type Inference for Action Semantics".
November 2: Dr. Andrzej Filinski, Carnegie-Mellon University, "Declarative Continuations and Categorical Duality".
November 14: Dr. Radia Perlman, Digital Equipment Corportation, "Calculating a Safe Route in a Computer Network Despite Traitorous Advisors".
November 20: Dr. Andrzej Ciepielwwski, University of Iowa, "Parallel Implementations of Prolog: How to Map Dynamic Trees to Multiple Processors".
November 29: Dr. Olivier Danvy, Kansas State University, "Partial Evaluation in Parallel".
January 17: Dr. Lou Rosier, University of Texas-Austin, "Ideas and Results Concerning the Scheduling of Hard-Real-Time Systems".
January 18: Dr. Mikhail Bulyonkov, Institute of Informatics Systems, Novosibirsk, USSR, "Mixed Computation - Partial Evaluation and Data Specialization".
January 24: Dr. Dan Marinescu, Purdue University, "Perfomance Analysis of Paralled Computations on Distributed Memory Multiprocessors: Models and Experiments".
February 28: Dr. Jurgen Koslowski, Kansas State University-Mathematics, "Currying in Computer Science".
March 6: Mary Lou Hines, PhD Candidate, Kansas State University, "Conceptual Object-Oriented Database: the COODB Model".
March 7: Dr. Cliff Stoll, Harvard-Smithsonian Center for Astrophysics, "Stalking the Wily Hacker".
March 18: Dr. Pierre Jouvelot, Ecole des Mines de Paris, France, "Effect Reconstruction in Polymorphic Effect Systems".
March 21: Mr. Richard W. Stephenson, Advanced Technology, SW Bell-St. Louis, "The Evolving ISDN Network".
April 3: Dr. S. Lakshmivarahan, Univ. of Oklahoma, "Symmetry in Interconnection Networks".
April 19: Dr. Donald A. Smith, Brandeis University, "Partial Evaluation of Logic Programs: Concepts and Experiments".

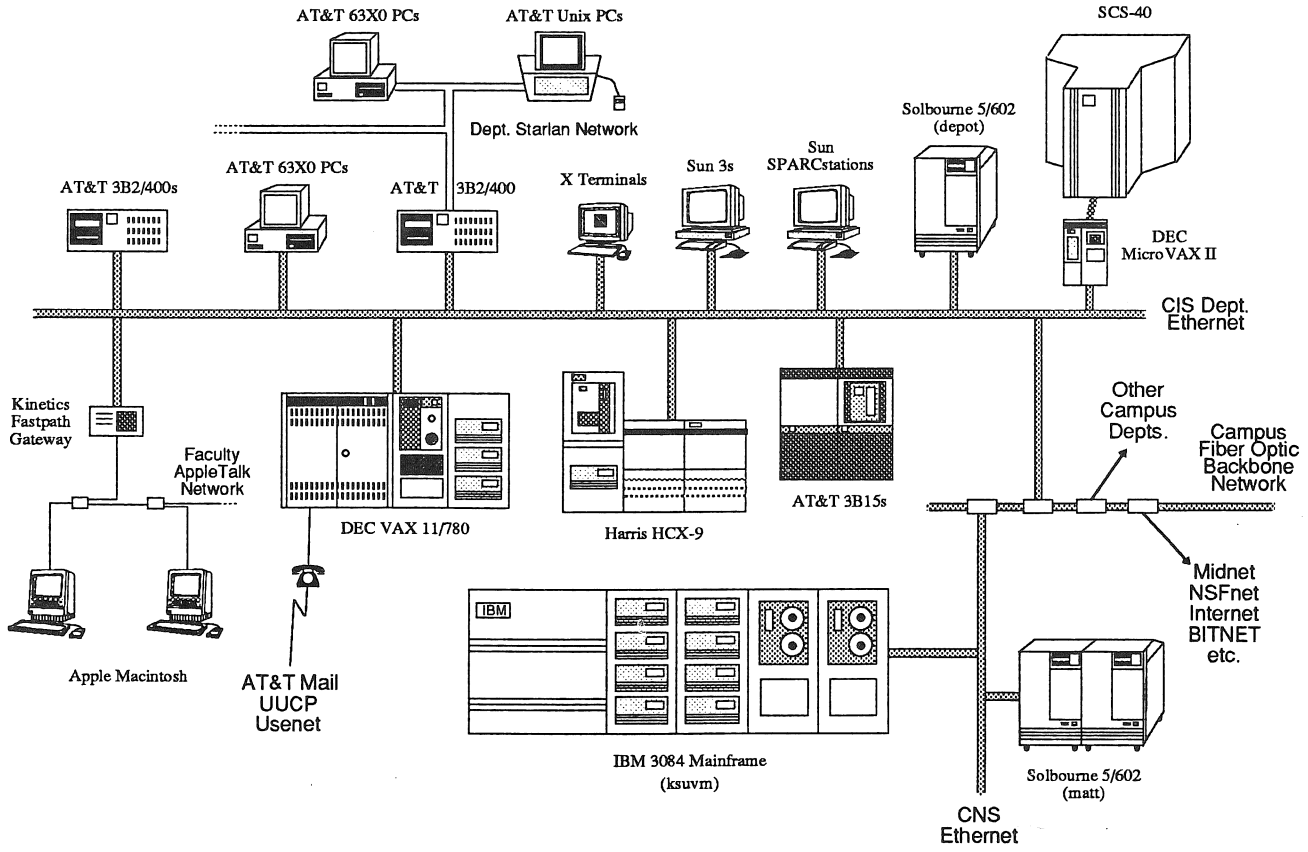
Seminar Presentations (continued)

May 2: Dr. Guntis Barzdins, New Mexico State, "Inductive Synthesis of Term Rewriting Systems".
May 9: Dr.Chet Murthy, Cornell, "Extracting Computational Context from Classical Proofs".
May 20: Dr. Peter D. Moses, Aahus University, "Denotatonal Semantics".
May 31: Dr. Michael Raynal, IRISA, France, "The Casual Ordering and A Simple Way".
June 3: Dr. Anthony J. Bonner, Indiana University, "Objects and Views".
June 24: Dr. Ira Pohl, University of California, Santa Cruz, "Object Oriented Programming and Design".

CIS Goes Satellite

Computing, communications, and information technologies sit on a rapidly changing knowledge base. While undergraduate and graduate programs in CIS and computer engineering give graduates a solid base for the near future, it is difficult for professionals in the field to keep up with the rapid changes in theory, systems, and technology. Thus, CIS is expanding its instructional programs at the MS level by offering courses via satellite. In the Spring 1992 semester, Dr. Elizabeth Unger will offer a graduate course in data base systems design/security/integrity. Through a contract with the National Technological University, this course (and future courses) will be available to more than 100 companies nationwide. These courses will apply to an MS in Computer Science at KSU or to an MS in Computer Science offered entirely vis satellite from NTU. Maybe it's time to upgrade your skills and/or pursue an advanced degree. See us on the "tube" and keep abreast of the changing technology.

Department Network and Machine Configuration



Department Scholarship News

This year is one of our best ever for awarding Department scholarships. Here are the current recipients.

Freshmen.

Nicole Lark, Kansas City, KS: Phillips Petroleum

Sophomores.

Matthew Jones, Wichita, KS: Conoco Oil
Christopher Luedders, Bremen, KS: Conoco Oil
Rick Un, Wichita, KS: Phillips Petroleum

These sophomores have been an outstanding group. They have really lived up to their potential - their average GPA was over 3.8 for last year.

Juniors.

Teresa L. Detter, Concordia, KS: DST Systems
Greg Haynes, Colorado Springs, CO: IBM Corp.
William Smeed, Overland Park, KS: Conoco Oil

This group continues to amaze us with the quality of their academic work and the range of interests they have, both on and off-campus.

Seniors.

Robert A. Swenson, Lawrence, KS: Conoco Oil
Christopher Thompson, Stilwell, KS: DST Systems
Joseph Young: Wichita, KS: IBM Corporation and Phillips Petroleum

We are always saddened when these fine young people are about ready to leave. Certainly this group will play an important role in the future of our profession.

We want to acknowledge and thank the companies who make the scholarships possible. These scholarship funds help us meet our on-going goal of attracting"the best and brightest" to our program.

Nichols Nugget: Sharing Nichols

Nichols is the "home" of Computer Science at Kansas State. The building also houses the Speech Department (and the nationally recognized Debate Champions), a 300 seat theater (that is really something to see), numerous performance rooms, and overflow book storage from Farrell Library. When the Alumni Fondation bought the old Farm Bureau building, there was quite a lot of discussion about moving some of the book storage to that facility. However due to the budget crisis in the state, we did not think that it would happen very soon.

Now it appears to be almost certain that the books will be moved and we will have at least part of the basement, hopefully in the 91-92 school year. There will room for a number of computer laboratories and classrooms. It would satisfy our space needs for the next ten years.

Service Course News

Our largest service course (about 1,800 students per year), CIS 110 Introduction to Personal Computing, has a new format. The course now has two hours lecture and one hour recitation per week. A new laboratory consisting of 22 personal computers has been set up in Fairchild 202, and the recitation sections meet there. We have set a limit of 40 students in the recitation sections, so the students work in pairs on the computers. This gives us a chance to provide hands-on training on a scheduled basis and gives more time for on-line quizzes and the like. We think this is an important step in solving student complaints about the course.

Death Reported: Neal Strunk

We recently received word of the death of Neal Strunk, M.S. 1982. Since his graduation, Neal had worked for Texas Instuments in Plano, Texas.

He is survived by his parents, Mr. and Mrs. Richard Strunk of Colwich, Kansas. Our most sincere condolences to his family.

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 ☐ $200 ☐ $100

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. This fact has not changed in the slightest since the newsletter of last year. We still have three major categories which we believe 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. A consulting study in 1990 found that the KSU Library is now short of minimum standards by 36,000 sq. ft., and that shortage will grow to 122,250 sq. ft. by 2020. Over the past several years, the inflation rate for library materials has increased by 14.7% per year. KSU has canceled 1629 subscriptions since 1989. 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. Thanks to your help, we have been able to attract quality students. For example, the junior class has three high school valedictorians, and they have continued to perform extremely well here at the University.

Third, we 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 in addition, 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 funding their travel. You might also want to note the number and quality of speakers we have had in the Department over the past year.

We established the Development Fund four 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

The Department of Computing and Information Sciences
234 Nichols Hall
Kansas State University
Manhattan, KS 66506-2302

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: _____
_____