Dear Alumni & Other Friends
of the Cal Poly CSc Department –

In honor of the 25th anniversary year of the Computer Science Department, this issue of the department newsletter will review where we started and where we are today. In the Spring of 1995, we hope to discuss where we hope to go in the future through a review and evaluation of our experimental graduate sequence in software, engineering.

In 1984, Computer Science became a department in the College of Engineering, leaving our statistics colleagues in the College of Science and Mathematics. More recently, the Computer Science and Electrical Engineering Departments have jointly developed a program in computer engineering.

We’ve tried to fill you in on changes in personnel, resources, curriculum, computing environment and laboratory facilities as well. (Please see related articles.) We are appreciative of the support shown by Hewlett-Packard and the Tandem Corp. who provided workstations for use in computer literacy and upper division computer science courses. We have recently increased the space available for our laboratory facilities; we now have separate labs for computer engineering and computer architecture, computer graphics, databases, and a graduate research laboratory for software engineering.

Our curriculum has evolved from an emphasis on application programming to systems programming; today we see increasing emphasis on the fundamentals for supporting both, in terms of computer science theory and software.

Twenty-five years may seem a long, long time, but those early days of the department are still vivid in my memory. There have been many changes in those years.

Our origin was in the Mathematics Department. Those faculty who taught computer science, statistics, and philosophy were split off into a new department, Computer Science and Statistics. The reason for this conglomerate was to make the department of a size that justified the overhead of departmental status. This combination gave us a total of 24 faculty. It was Dean Clyde Fisher’s (now deceased) idea to do this and it was largely due to him that the growing stature of our discipline was recognized.

(Please see First Chair on Page 3)

(Curtis Gerald with Mark Lewis at the console of state-of-the-art equipment in the early 1970s.)

(Please see Department Chair on Page 3)
New Faculty Strengthen Program

A nationwide search for new tenure track (permanent) faculty has resulted in two additions to the Computer Science Department. Assistant Professors Mei-Ling Liu, from the University of California at Santa Barbara, and Emilia Villarreal, from the University of Texas at Austin, joined the faculty in September. Both finished their doctoral work over the summer.

Dr. Liu’s research is in distributed database systems. Her dissertation, “Performance of Distributed Database Systems in the Presence of Failures,” addressed design issues which hinder the acceptance of distributed databases in the industry. Dr. Liu brings industrial experience from UNISYS, Varian Data Machines, TRW Data Systems, Science Applications ComSystems Corp., and General Electric Company, as well as four years in Cal Poly’s Information Systems Division. She left Cal Poly to pursue full-time graduate work in 1989.

Dr. Villarreal’s expertise is in the area of database languages. Her dissertation, “Automated Compiler Generation for Extensible Database Languages,” developed a language and compiler for expressing the syntax and semantics of new object-oriented and relational data languages very compactly so that changes to the data languages can be made comparatively easy. Dr. Villarreal’s industrial experience includes work at IBM, Microelectronics and Computer Technology Corp., and other corporations.

In addition, Dr. Joy Shetler became the first faculty hired to support the computer engineering program. Her “home” department is Electronic and Electrical Engineering and she will teach in the computer science area half-time. Dr. Shetler graduated from the University of California at Santa Barbara and taught at Texas A&M University. Her research areas are computer design, architecture and VLSI.

Drs. Liu and Villarreal were both participants in the CSU Forgivable Loan/Doctoral Incentive program. This program provides up to $10,000 funding per year for a maximum of three years to women, minorities and persons with disabilities to earn the doctorate in academic fields where they are historically underrepresented. After completion of the doctoral program, twenty percent of the loan is forgiven for each year of full-time faculty service in the CSU. (If you would like to know more about the forgivable loan program, contact the affirmative action officer at any CSU campus.)

Computer Science Location Renamed for Engineering Alum

Cal Poly’s Computer Science Building was renamed the Frank E. Pilling Building in an April 1994 ceremony in recognition of the 1956 engineering alumnus who donated $1 million to the College of Engineering.

Pilling and his family were on site for the formal dedication, and toured Computer Science Department facilities as part of the day’s events.

Pilling’s gift established an unrestricted endowment in the College of Engineering, of which the Computer Science Department is a part. Earnings generated by the endowment will focus on enhancing the professional expertise of the faculty in the College of Engineering, enriching the curriculum, generating opportunities for increased interaction with industry, and providing support for the high technology “classroom of the future.”
Computer Science Today
Far Cry from 1969

Apart from the name, today's Computer Science curriculum bears little resemblance to its counterpart of 25 years ago. The growth of knowledge in Computer Science has been extraordinary, and this growth is particularly evident when we examine the dramatic change in curriculum during this period.

Today's computer science undergraduates must complete nearly two and one half times as many computer science units as were required in 1969. There are 85 units of required computer science courses (a core of 73 units, plus 12 technical units which replaced the "concentrations" many alumni completed). In 1969, a mere 36 units of computer science satisfied the bachelor's degree requirements. This is only slightly more than computer science minors complete in 1994. Courses considered fundamental in 1994 (data structures, software engineering, database systems, and computer networks) were absent in 1969. Our early curriculum used compilers and operating systems, but the content of those courses was only faintly similar to their successors today. The 1969 versions of the introductory courses would seem primitive if taught today.

Virtually none of today's elective courses existed in 1969. Major fields of study such as artificial intelligence and computer graphics were in their infancy, and today's advanced electives, such as knowledge-based systems and advanced rendering techniques, had barely been dreamed of.

Add to all this the rapid changes in the computing environment (see related story), and you get a far different education as an undergraduate computer science major at Cal Poly today. What remains the same are the things that make Cal Poly what it is: relatively small class sizes, hands-on experience, and a well-earned status as one of the best regional universities in the West.

There is little doubt that rapid change will continue in the near future. Those of us who develop curricula will have no time to rest. Those who wish to stay current have no time to stop learning.

Department Chair (continued from page 1)

engineering. In addition, we continue to develop strengths in the areas of computer graphics, artificial intelligence, and software engineering. The B.S. in computer science has been accredited since 1986 by the Computing Sciences Accreditation Board (CSAB).

I hope that this issue of our newsletter will give you some idea of where we came from and where we are today. To help us go the right direction in the future we are in the process of reconstituting the Computer Science Department Industrial Advisory Council. If you know of any technical or other senior management who are supportive of the CSC or CPE programs and would be interested in serving on the CSC IAC, please let the department office know.

Jim Beug, Professor & Chairman
Department of Computer Science

eMail: jbeug@calpoly.edu, URL: http://phoenix.calpoly.edu/

First Chair (continued from page 1)

Some thought it odd that philosophy and statistics were joined with us, but I sometimes said:

**Philosophy teaches how we know what we think we know.**

**Statistics teaches how we can be sure of what we know in the presence of uncertainty.**

Statistics obviously requires computers and at least the logic part of philosophy is fundamental to computers.

Both of these other disciplines later grew into their own departmental status but by that time our own faculty had grown in numbers and the importance of computers and their utilization was more fully recognized.

The major problems we faced in the beginning were finding qualified faculty and adequate computing resources. We were fortunate that some excellent people were found and we made do with what now seems primitive computing power. (I remember that our first "mainframe" had 128k bytes of memory, and it replaced an even more primitive "minicomputer". When we tried to run a single graphics terminal on the "mainframe", we had to dedicate it to that service)

At the start, we thought that computer courses should emphasize applications. We had little in the way of computer science theory in the early days. Of course, that aspect of computer science had barely begun its development. There was also little emphasis on hardware—Electronic Engineering had the monopoly there.

It is gratifying to me to see how things have progressed in these 25 years. I am proud to have had a part in starting what has become one of the more respected departments of computer science in the nation.

Curtis Gerald, Head of Computer Science, 1969-72
Punch Cards and 36-Hour Turnaround Standard for 1969

In September 1969 the Department of Computer Science, Statistics, and Philosophy was formed; our new building was completed and I joined the faculty with an administrative assignment to direct the new computer center. The equipment delivered was an IBM 360/40 with 128k of memory and 14.5 meg of disk. It was a card-oriented system with a single-user, single partition operating system.

If you weren’t in this business 25 years ago, you may think about the capacity of your Macintosh or PC and wonder how we could get anything done, let alone support a 9,000-student campus. My answer lies in the comparison between a Model A Ford and a new car today. The differences in comfort, convenience, speed, safety and reliability are overwhelming, but the basic Point A to Point B transportation capability is about the same.

The significant differences over the past 25 years aren’t in the hardware or software but in the user interface dictated by the limitations. Students prepared jobs on decks of punched cards submitted in batches, and they soon overwhelmed the processing capacity. We were queuing from a finite population, and turnaround time leveled off at around 30 to 36 hours.

The “ready room” was a popular place 24 hours a day. Besides lining up for use of the few card punches, a lot of careful planning and proofreading time was warranted before committing your deck to a 30-hour tour of the machine room, perhaps only to find a misplaced comma. The social and technical atmosphere gave birth to many long-term professional collaborations and even a few start-up companies.

The management and public relations strategies were interesting case studies. One of our most effective strategies for minimizing decibels of complaint was keeping the queue visible. We queued trays of cards on tables with clearly visible job submission times so users could see how far back their jobs were. Priority algorithms became a constant challenge. We also realized that maintaining custody of the decks was a necessary filter to slow down resubmissions.

Still we managed, and kept our mission in clear focus. When we shoved that 30-hour backlog aside, and turned the only serious machine on campus over to Professor Hsu’s operating system class at midnight on Saturday nights you knew we were determined to support computer science. A comforting thought as long as you didn’t have to clamber out of bed and actually be there.

Ray Boche
Professor, Computer Science
Today's Students Have Variety of Resources

Today, students and faculty have a much wider variety of computing resources than in the past. Students can work at home and access any of three central computing resources or many on-campus workstation networks via 140 14,400 baud SLIP-capable modem lines. The central resources run various versions of UNIX. PC and Mac labs run by the computer center provide many dozens of seats for walk-in work.

While 25 years ago there were 3 a.m. sessions waiting for your program card deck to return, it is now even easier to be working at that time. At quarter's end as many as 60 people have been logged into just the computer center RS/6000 cluster at 3 a.m.

Of course a big difference today is that those are not just Computer Science people. Computer labs and terminal rooms are operated all over campus by various colleges and the computer center. Cal Poly students create their own UNIX accounts, which remain until they graduate (just like accounts for computer science and computer engineering majors in our department computer servers). There are at least 16,000 active UNIX accounts at Cal Poly today. Many machines and nets on campus, both inside and outside the department, are administered by computer science majors. We even have a very popular course on UNIX system administration to provide the expertise to keep the campus running through future generations of students.

Besides classes, we have all those nice off-campus networks to absorb all remaining hours of the day (or is it the other way around?). USENET news groups have been available for about 10 years and the campus now receives about 50,000+ messages a day via a machine in the CSL. There is the Gopher program available on CSL and Computer Center machines for roaming the Internet as well as Mosaic for exploring the World Wide Web.

In the network area, the campus has moved from broadband ethernet to FDDI and fiber optics cable. Use of ATM (asynchronous transfer mode) technology is now being evaluated for the main backbone.

Department resources include two Sun file servers and a Sequent for central computing capability, twenty Hewlett-Packard workstations donated to support graphics and software engineering, two Pyramids for special projects, three Sun file servers donated to support graduate software engineering, two labs of 386 class personal computers donated by Tandem Computers, a Macintosh lab and various other workstations and peripherals.

Don Erickson, CSL Manager, and Professor Chuck Dana contributed to this article.
Familiar Faces Retire from the Scene

Visitors to campus will miss several familiar faces next time they stop by the Computer Science Department. Professors Roger Camp, Zane Motteler and Neil Webre, and Instructor Pasha Rostov, have all elected to retire in recent years.

Roger C. Camp writes:

For about six months I worked on a Caltrans project discovering the inner workings of the diagnostic connector for GM and Chrysler automobiles. Since that time my wife and I have been traveling to several places in the US and around the world. I have continued to consult for a small company in the midwest and play some golf. Like so many others who have retired, I wonder how I was able to fit Cal Poly in my time. There are never enough hours in the day, but I do try to keep in touch with many ex-students via email almost daily. I still care about the health and well-being of the department and try to stay in touch whenever possible. Certainly wish the department would sponsor some short courses for our alumni so they would have a reason to come back to SLO for a few days. You can keep in touch with Roger at: rcamp@onramp.calpoly.edu, (805) 544-6044; 6025 White Oak Lane, San Luis Obispo, CA 93401.

Zane C. Motteler says:

When I retired I accepted a full-time appointment at Lawrence Livermore National Laboratory as Senior Computer Scientist. As such I wear several hats. One of these is maintenance and future design and development of Basis, a code development system for major simulation codes, and particularly its user interface, which I worked on as a summer appointee and consultant starting in 1986, while I was a Cal Poly faculty member. Secondly, I am principal computer scientist in the icf3d project. "icf" refers to inertial confinement fusion, the goal of this area of the lab, to produce power by inducing thermonuclear fusion in hohlraums bombarded by powerful lasers. If successful, this could provide cheap and nearly pollution-free power. "3d" refers to the fact that this is a three-dimensional hydrodynamics code. It is being written in C++; I have linked it successfully to the Basis interface, which was written mainly in FORTRAN and some C. Thirdly, I am responsible for linking the Basis capability to another major simulation code, the Global Climate Simulation Model. The work is challenging and fun, and I don't miss teaching at all.

My wife Marilyn and I live at 7792 Oak Creek Court, Pleasanton 94588, 510/462-9790, zm@lbl.gov. I always like to hear from colleagues and former students.

Neil W. Webre writes:

I am very happily retired and living in Virginia on the shores of the Chesapeake Bay. Anne is teaching, co-authoring a book, and is enrolled in an EdD program at Bill & Mary U. We still have two kids in school. We beat the summer heat and rain this year by working in the North Carolina mountains for most of the summer. It was cool and green with lots of hiking and rivers to paddle. This fall, I will be taking my new motorsailer up to the coast of Maine for a month-long cruise. I expect it to be chilly but lovely. I keep busier than I would like dealing with the family and with personal business. Greetings to all and, as they say in the South, "Y'all come on by, yuh hah!"

Neil can be reached at: nwebre@galaxy.csc.calpoly.edu; (804) 725-4425; P. O. Box 128, Cobbs Creek, VA 23035.

Professors Neil Webre, Roger Camp, and Zane Motteler were honored at a retirement party.
Drop Us a Line

The Computer Science Department faculty and staff are interested in hearing from you! Next time you think of Cal Poly, drop us a line and let us know what you’re doing, where you’re working or how we can work together.

<table>
<thead>
<tr>
<th>Name</th>
<th>Email Address*</th>
<th>Name</th>
<th>Email Address*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emile Attala</td>
<td>eattala</td>
<td>S. Ron Oliver</td>
<td>srother</td>
</tr>
<tr>
<td>Jim Beug</td>
<td>jbeug</td>
<td>Cornel Pokorny</td>
<td>cpolkorny</td>
</tr>
<tr>
<td>Ray Boche</td>
<td>rboche</td>
<td>Clint Staley</td>
<td>cstaley</td>
</tr>
<tr>
<td>Chris Buckalew</td>
<td>buckalew</td>
<td>Dan Stearns</td>
<td>dstearns</td>
</tr>
<tr>
<td>Lois Brady</td>
<td>lbrady</td>
<td>Dan Stubbs</td>
<td>dstubbs</td>
</tr>
<tr>
<td>Laurian Chirica</td>
<td>lchirica</td>
<td>Emilia Villarreal</td>
<td>evillarr</td>
</tr>
<tr>
<td>John Connely</td>
<td>jconnely</td>
<td>Pat Wheatley</td>
<td>pwheatle</td>
</tr>
<tr>
<td>Chuck Dana</td>
<td>chdana</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gene Fisher</td>
<td>gfisher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joe Grimes</td>
<td>jgrimes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>John Hsu</td>
<td>jhshs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elmo Keller</td>
<td>ekeller</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mei-Ling Liu</td>
<td>mlui</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sham Luthra</td>
<td>sluthra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Len Myers</td>
<td>lmyers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Send email to EmailAddress@csc.calpoly.edu.

Alumni Update

We’ve reserved space in the spring 95 newsletter for some alumni updates. We’d like to hear from you.

Address (if different from label) _____________________________________________________________

Employer ___________________________ Job Title ________________________________

Recent activities/other information you’d like to share:

Suggestions for the newsletter:

Please mail to: Newsletter, Computer Science Department, Cal Poly, San Luis Obispo, CA 93407; or email to: estier@csc.calpoly.edu
Cal Poly CSC Is On The Web

World Wide Web (WWW) projects are taking Cal Poly from California's Central Coast onto the computer screens of interested users throughout the world.

WWW is a distributed hypermedia system consisting of documents, pictures, video and sound distributed worldwide and accessible via the Internet using segmented names or document locators known as URLs (universal resource locators). The documents are generated using text processing software, cameras and recording devices. They are retrieved and viewed with client software that runs on X Windows, Microsoft Windows and Macintosh.

Assoc. Professor Chris Buckalew, Instructor Dennis Butler and several students have been working on the Computer Science Department's "home page" and associated pointers. Currently on-line and accessible to the world are faculty biographies and photos, curriculum, laboratory facilities, and other information of interest to prospective students, employers, and department supporters.

At the same time, Buckalew and Butler, along with a group of graduate and upper division students, have been working on a WWW project for the Synthesis Engineering Education Coalition (a nationwide coalition). This effort will make curricular material available on-line worldwide, including text, images, animation, sound, and courseware modules. Currently several modules on introductory computer science material (written by Dennis Butler) are on-line, with more coming. Assoc. Professor Dan Stearns is relying exclusively on the Web for the experimental software engineering sequence.

Professor Jim Beug and graduate student Jim Aviani have been exploring the problem of finding relevant information via the Web to provide current awareness to faculty and student research in computer science.

The department envisions using the web for future applications such as interactive distance learning and department outreach to industry, community and schools. The URL for the Computer Science Department's home page is http://phoenix.csc.calpoly.edu/. There is also a link to our home page on the Cal Poly home page, URL http://www.calpoly.edu/. The Cal Poly administration is exploring putting the university catalog, admissions information and other materials on-line also.