WHAT'S NEW?

IBM Donates Supercomputer

Texas Tech received a grant from IBM Thursday, April 2, that will allow use of a new supercomputer and accompanying software.

The new IBM RS/6000 SP Supercomputer, valued at $484,373, was donated under provisions of an IBM Shared University Research Grant.

In addition, Tech’s membership in the IBM Higher Education Software Consortium gives it the right to use associated software valued at more than $730,000.

This grant is provided to IBM as part of the Software Engineering Research, Training and Education Center (SERTEC) at Tech.

Bill Marcy, Associate Dean of the College of Engineering and acting Chairman of CS, said standard personal computers use a serial computing system, which takes a problem and divides it into sequentially solved chunks. The supercomputer uses a parallel system, in which the chunks of a problem are solved simultaneously.

Marcy said an equation that would take a regular Pentium computer 1,000 years to solve would take an IBM RS/6000 SP Supercomputer one second. “It is the best supercomputer in the world.”

“This computer does a lot as far as upgrading our capabilities,” said Don Bagert, a CS Associate Professor, “We really didn’t have any super computer capabilities until now. We had some capability for parallel processing, but now we’ll be able to do more research in high performance computing.”

SERTEC is a new center that has been proposed jointly by the College of Engineering (COE) and the College of Business Administration (COBA).

The super computers grant’s approval passed partly because of an additional partnership with Phillips Petroleum that will provide a high-performance, AIX parallel-computing environment to COE and COBA.

Computer Haptics

Touch is very important to humans, as demonstrated by any child who, when asking to ‘see’ an item, will reach out its hand to palpate and get the ‘feel’ of the object of interest. Dr. Bharti Temkin and her research assistants are currently working on computer haptics; a cutting edge of virtual reality method of interaction. The term "haptic" may be unfamiliar, but it simply means

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the sense of touch. The idea of an interface that provides force-feedback in three dimensions is truly exciting. The possibility of "feeling" the "texture" of data in multidimensional space is an entirely new experience. In addition, it is natural for humans to visually inspect objects from all angles including the depth perception.

Touch and 3D stereoscopic vision are primary components of highly valued complex human skills (e.g. medical surgery) and yet training is not a trivial matter, since these skills can often only be learned on the real materials, which may be of too great a value to expose to the novice. A technique for simulating these types of interactions would be truly exciting and extremely valuable. Due to the obvious downside of training on live humans and the limited appropriateness of cadavers, a technique for simulated surgery would be extremely valuable in these situations. Although some attempts have been made into this endeavor, the current software techniques impose severe limits on the size and the speed of the simulations. In our work, we hope to improve the speed (and thus size) of the simulations.

Fueled by continuing advances in computing technology, the stage is thus set to interface haptics to 3D stereoscopic graphics. This will enable us to feel and see objects with depth that only exist in the virtual worlds we create. Dr. Temkin’s group is working on stereoscopic, 3D graphics/animation and haptic interfaces. We will be using commercial packages, as efficient use of the existing software is crucial to the implementation of this vision. As programs and software become more complex, the use of commercial standard software practices will help to (1) greatly reduce the amount of time and effort required to implement the software components that embody the intellectual property, algorithms and research and (2) reproduce the research environment and results.

With our projects, we hope to open the door for future students to apply our work in many fields such as education, medicine, and entertainment. In particular, our students will be creating a Computer-Based Medical System by extending the work to the Visible Human Project’s data set. This extension will facilitate medical training applications, e.g. surgical training.

BY BHARTI TEMKIN, CS Assistant Professor

Texas to License Professional Engineers in Software Engineering

Dr. William Marcy and Dr. Don Bagert are currently heavily involved with the efforts to licensing professional engineers in software engineering in Texas.

The Texas Board of Professional Engineers recently voted unanimously to recognize software engineering as a discipline as having a knowledge base sufficient to allow licensing for professional engineers (PE’s) in that area. Although the proposal is still pending a period of public comment and a final vote, it appears that starting in June 1998, Texas will be the first state in the U.S. to license PE's in software engineering.

It is expected that if Texas gives final approval to the software engineering licensing, the other states that also regulate engineering will soon follow suit. Licensing, along with accreditation, is going to have a large impact on both how academia educates software professionals, and industry employs them. Exciting, but challenging, times ahead for software engineering practitioners in the United States.

BY DON BAGERT, CS Associate Professor

Static Analysis

Dr. Susan A. Mengel is working on the static analysis of student programs. Static analysis involves the collection of metrics, such as lines of code and number of functions, to help to understand how students are mastering the concepts presented in class. For example, if two students have working programs, but one program has 100 lines of code and another 50, the student needs to focus more on mastering the programming language and the logic to do the program.

Static analysis also involves the construction of a control flow (Continued on page 3)
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graph to show how students are using the control constructs, such as if statements and looping structures. Example control flow graphs are shown below for the same program assignment. If the programs had no if statements or looping structures, the flow graph would be a flat line, so, the more levels a flow graph has, the more complex it is. By showing the flow graphs to students, they can visualize what their code looks like. They can also determine if they are programming as well as other students by simply looking at the other flow graphs.

Preliminary results for analyzing CS 1462 Fundamentals of Computer Science I programs using the Verilog Logiscope™ static analysis software have been interesting. Student’s progress throughout the semester by improving dramatically in their ability to use functions and others still has difficulty. The results of the analysis will be used in the future to help students focus in on their own programming ability and how to improve it.

**FACULTY UPDATE**

**Professor's**

**JOHN K. ANTONIO**

Dr. John K. Antonio, Associate Professor, was recently asked to serve as Vice General Chair for the merged 13th International Parallel Processing Symposium & 10th Symposium on Parallel and Distributed Processing (IPPS/SPDP) to be held in San Juan, Puerto Rico in the spring of 1999. He is also serving as General Chair for the 8th Heterogeneous Computing Workshop (HCW ‘99) which is to be held in conjunction with IPPS/SPDP. Dr. Antonio co-authored five journal articles that appeared in print during 1997. These articles were published in several different journals, including two different IEEE Transactions, Journal of Parallel and Distributed Computing, and IEEE Concurrency.

**DON BAGERT**

Dr. Bagert, Associate Professor has been extremely busy. Besides serving as Co-Director of SERTEC, he just came back from running a workshop at the Conference on Software Engineering Education and Training 1998 (CSEE&T 98). Dr. Bagert will be program chair for CSEE&T 99. He and the programming team will be running the UIL Region I AAAAA Computer Science Competition for the second straight year. The Programming Contest component of the competition will be held the Petroleum Engineering Building, room 118, on April 24. Dr. Bagert will also be head judge for the UIL state contest in Austin on May 9th.

**JON BURGIN**

Congratulations to Jon Burgin, a CS Lecturer, who was awarded a $2000 summer research award from the graduate school. Only a few of these awards are given to graduate students each year. Jon’s research competed against graduate students, university wide, and he was the only individual in our department to be awarded this year. He is doing advanced work on haptic systems that he describes as “virtual reality that you can touch”.

**DR. OLDHAM**

Dr. Oldham, Professor, and his assistant, Pilar Gomez, published the following in 1997:

- “Application of Recurrent Neural Networks for the Prediction on the Behavior of Biological Oscillators”. This was published in the “VII International Conference on Electronics, Communications and Computers, CONIELECOMP 97” at the Universidad de las Americas in February 1997.


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The latter paper was recognized as the best paper in the category of applied research. Way to go Dr. Oldham and Pilar!

**TA's & RA's**

**JACK WEST & JEFF MUEHRING**

Jack West and Jeff Muehring, CS research assistants, co-authored papers with Dr. Antonio that were accepted at the 3rd International Workshop on Embedded HPC Systems and Applications (EHPC'98). West and Antonio's paper was entitled, "Simulation of the Communication Time for a Space-Time Adaptive Processing Algorithm on a Parallel Embedded System". Muehring and Antonio published "Optimal Configuration of Compute Nodes for Synthetic Aperture Radar Processing".

**NIKHIL GUPTA**

Nikhil Gupta, a CS research assistant, joined with Dr. Antonio to write "Reconfigurable Computing for Space-time Adaptive Processing" which will be presented at the Symposium on Field-Programmable Custom Computing Machines (FCCM '98).

**TIM OSMULSKI**

Tim Osmulski, research assistant to Dr. Antonio, has completed his research assignment at TTU and become gainfully employed with Rockwell, Inc. of Dallas, TX. Tim defended his Master's Thesis "Implementation and Evaluation of a Power Prediction Model for an FPGA this past March.

**BRIAN VEALE**

Brian Veale, a December '97 BS graduate in CS from TTU is now a graduate student in the CS master's program. Brian worked as a TA for Dr. Antonio during the spring semester, and will be joining Dr. Antonio's HPCL research assistants this summer.

**STAFF UPDATE**

**JILL CYPERT**

Jill has been swamped, preparing for graduate pre-registration advising which began March 31st. She also is a member of the scholarship committee and is currently reviewing scholarship applications. Among those time consuming activities, she still finds time to do her daily responsibilities, such as, purchasing reports, ledgers, and meeting with students.

**DIANE RIED**

Diane has been preparing for undergraduate pre-registration advising which began March 31st as well. She has been sorting all undergraduate registration cards, distributing information to guide undergraduate students to their appropriate advisors, and getting all advisement materials for each student to their assigned advisors. Besides that, she has also found time to maintain her daily responsibilities, such as, travel vouchers for professors, answering phones, and directing and helping students.

**SHONDA FIELDS**

Shonda, our part-time secretary, has recently been busy with University Day and Lubbock On-Campus Day. With faculty, staff, and student participation, this year's University Day was a great success. Shonda organized a display of recent technology to "showoff" to prospective students. The new technology display worked; over 60 students visited the CS booth. She has also been busy communicating to prospective undergraduate and graduate students and organizing monthly birthday parties for the CS faculty and staff.

**CS ALUMNI UPDATE**

**THOMAS H. PAYTON**

Tom graduated with BS in Computer Science in December 1989. He is currently working on a Master’s degree in History and is the volunteer Director of the Computer Science Alumni Association. Tom and his wife, Terry, have one daughter, Daegan, and are expecting another baby this summer. He and his wife run a few heads of cattle Southeast of Lubbock and are very active in their church; Tom is a Sunday school teacher. He currently works for CO2 Services as Director of Computer Operations. CO2 Services is an independently owned company that produces food grad carbon dioxide for bottling companies and meat packers. Tom also does some consulting in the Lubbock area. Currently, his biggest client is (Continued on page 5)
this wife’s company for who he acts as chief consultant and oversees their entire computer needs.

LARRY D. PYEATT

After Larry finished his MS in Computer Science, he went to work for Texaco in Houston. He worked in a small AI group; AI’s mission was to apply AI technology to problems within the company. After 2 years at Texaco, Larry was accepted to Colorado State to work on his Ph.D. His dissertation work is in learning new low level behaviors in multi-level robot control architecture. He is using reinforcement learning for the low-level behaviors.

KIRK E. WALLACE

Kirk graduated with his BS degree in Computer Science in 1993. He is Senior Programmer at GST Action Telcom in Abilene, Texas. Kirk’s primary responsibility is designing network management software for telecommunication companies. His current project is for Southwestern Bell; he is developing a program that helps SWB provision their long distance network, validates CABS bills, and allows them to do searches on their long distance call records and Bellcore LERG data. Kirk and his girlfriend of 7 years, Shelly Rhyne, are engaged and will be married Saturday, April 18th, in Cisco, Texas. CONGRATS KIRK and SHELLY!!!

The 13th Annual ACM Banquet

The 13th Annual ACM Banquet will be held Saturday, April 21, 1998 from 6-8 PM at the UMC McInturf Center. Dinner will be served and various faculty, student, and alumni awards will be presented. Tickets cost $10 per person.

This year’s Computer Science Alumni of the Year nominees are:

- **Dr. Tom Harper.** Dr. Harper received his MS and Ph.D. in CS at Texas Tech. He is currently working for Pacific Northwest National Laboratories as Senior Research Scientist; he is responsible of networking and all security. Dr. Harper is Chairman of a committee investigating security for all national laboratories. As a Texas Tech student, Dr. Harper was active in ACM and UPE.

- **Jim Ollerton.** Jim received his BS in Computer Science in 1991. He is presently operates his own computer consulting service, Jim Ollerton Consulting. His business advises clients on computer hardware and software selection, application programming, services local area networks, and trains individuals on computer operating procedures.

- **Barry Salmon.** Barry was an active member in ACM; he was on the ACM programming team from 1988-1990, assisted in coaching the team in 1990-1991, and helped with the South Central programming contest in 1993 and 1994. He is now Regional Network Manager for Texas Department of Health, Region I. Barry also does consulting in the Lubbock area, specializing in networks and custom Web Pages.

This year's Friend of Computer Science nominees are:

- **Dr. Donald Bagert.** Dr. Bagert is an Associate Professor of the Computer Science Department. He has coached the Texas Tech Computer Science Programming Team for the past five years. Dr. Bagert has been instrumental in the design of the current CS curriculum.

- **Florence & Carl Myers.** Flo and her husband Carl, Lubbock residents, were instrumental in the beginnings of the Computer Science scholarship program. Through the Terry B. Myers Endowed Scholarship, they set the course for future scholarship development and assisted numerous students in meeting their financial needs while at Tech.

- **Mysti Digby.** Mysti Digby was with the CS Department for nearly 6 years, first as a Secretary II and then as an Administrative Secretary. She took an active role in BBBS as well as ACM and coordinated the alumni newsletter. Mysti is now the Administrative Assistant for Associate Dean Dr. William Marcy and continues to be available to the students, faculty, and alumni.

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To vote for this year CS Alumni of the Year and Friend of Computer Science or for more information on the ACM Banquet, please email Shonda (shonda@cs.coe.ttu.edu) by April 17, 1998. These awards are just some of the awards presented at the banquet. Good Luck to all the nominees and we hope to see you all there!

**Miscellaneous**

Several CS students, Todd Quasny, Adam Kohler, Dennis Bell, and Rob Theriot, were judges at the Texas Computer Education Association (TCEA) Region-17 programming contest in Lubbock on February 27th.

Dr. Bagert and other CS students will be judging at the TCEA state finals.

*If you have any questions regarding this edition of CSAN, please contact Shonda Fields at (806) 742-3527 or at shonda@cs.coe.ttu.edu.*