



CS@USU

COMPUTER SCIENCE DEPARTMENT NEWSLETTER
UTAH STATE UNIVERSITY

2007

Notes from the Department Head



I hope that this letter from the department finds all of our alumni and friends well and safe this New Year. 2007 was a good year for the department. In the Fall,

Curtis Dyreson, formerly of Washington State University, was added to the faculty. His area of emphasis is web-based database systems. It is interesting that he is the son of a former USU Computer Science faculty member – Del Dyreson. Del left USU in the late 1980's and spent some time as a faculty member in Saudi Arabia. He's now retired and living in Montana. It just goes to show that it's a small world.

Also, this year, Art Mahoney, one of our undergraduates, was the recipient of a Goldwater Scholarship. This is a very prestigious and competitive scholarship, and so we are very proud of Art and happy for his success. In fact, our graduates continue to do very well both professionally and academically. Over the years we have received numerous letters from alumni telling us of their successes, and also telling us that they felt their degree prepared them as well as any of the other new hires at their company or fellow new graduate students.

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Space Software Lab Develops Key Software System for Air Force Research Laboratory

The Air Force Research Laboratory (AFRL) of Kirtland AFB (Albuquerque, New Mexico) has chosen to base their new multi-million dollar Responsive Space Testbed Facility upon software developed by faculty and graduate and undergraduate students of the Computer Science Department of USU.

Scott Cannon, Professor, heads the Space Software Lab. Other participants in the project are Xiaojun Qi, Assistant Professor, Dan Watson, Associate Professor, Carson Jones, BS Fall 2007, Jay Fisher, BS Fall 2007, Kenneth Sundberg, BS '04, MS '06; Todd Hospodarsky MS '06; Jeff Willis BS '02 MS '04; Kevin Goodsell BS '01; Aaron Rice BS '01; and Larry Denys BS '01.



Scott Cannon and Carson Jones

The backbone of the Responsive Space Testbed is the Satellite Data Model (SDM) software system developed at USU. This software system provides support for the rapid integration, management, and operation of satellite components in a heterogeneous computing environment.

The rapid development and deployment of both research and tactical satellites is hampered by the cost and time associated with both software and hardware component integration. Each mission is usually a one-of-a-kind effort. Designing software and hardware components to meet custom Interface Control Documents (ICDs) represents a significant portion of a mission's budget.

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New Faculty -- Curtis Dyreson, Assistant Professor



Dr. Curtis Dyreson comes to USU from Washington State University where he was a faculty member for six years. Employment opportunities have taken Dyreson to Denmark's Aalborg University and to James Cook University and Bond University in Australia – the latter the down under country's only private university. He completed a PhD in computer science at the University of Arizona in 1994. Although he is a new faculty member,

Dyreson isn't new to USU; both his parents, Delmar Dyreson (computer science) and Margaret Dyreson (instructional design), are former USU faculty members.

Dyreson is also a strong advocate for interdisciplinary study – a path he himself followed. As an undergrad he studied medieval and Islamic history; a somewhat unlikely course for a computer science professor. In Dyreson's case, his current profession grew out of a campus job opportunity. As an undergrad, he became the campus expert on the university's IBM Series/1 minicomputer. "I was the card reader operator," he says. "When the director who headed the computer's operation left, I became the director." After a couple of years of employment in other areas, he decided to pursue graduate work in the field of computing.

"My research interests include temporal databases, native XML databases, data cubes and providing support for proscriptive metadata," he says.

Dyreson serves as anthology editor for the Association for Computing Machinery's Special Interest Group on Management of Data and is information director of the ACM's Transactions on Database Systems. He has authored or co-authored 11 articles for refereed journals and more than 30 refereed conference presentations.

Away from the keyboard, he enjoys sports, hiking, camping and mountain biking. He is an intrepid traveler who has visited every continent except for South America and Antarctica – and those could be on future itineraries.

Notes from the Department Head

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Starting July 1, our ABET (Accrediting Board for Engineering and Technology) accreditation was renewed for another six years. There were no concerns or deficiencies. Also important is the fact that the distance program is now ABET accredited. While still relatively small as compared to our regular day program, the distance program continues to grow at both the undergraduate and graduate levels. Under Utah House Bill 185, the department will be receiving funds to place full time faculty at distance sites to facilitate this growth. Of the two faculty positions that we will add next year, bringing us to 20 tenure track positions and two lecturers, one will be housed at Snow College in Ephraim, Utah. Over the next few years, we hope that with this funding we will be able to add faculty at College of Eastern Utah, and the branch campuses at Vernal and Tooele. We are also working with Salt Lake Community College and Weber State University to make our MS/CS available on their campuses for Fall 2008.

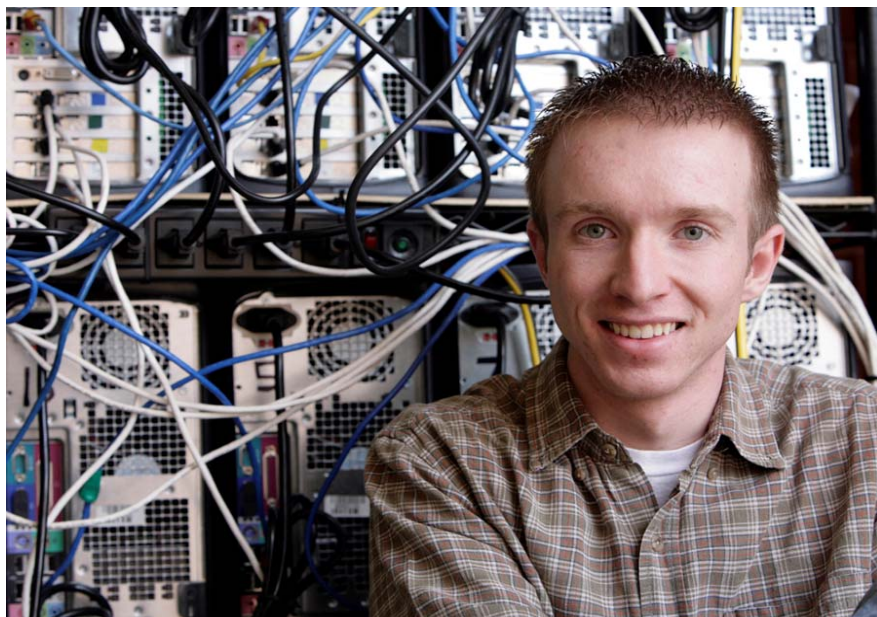
On campus, we are again experiencing growth. The PhD

program now has three graduates, with more in the pipeline. For Fall 2008, we expect 30 students in the PhD program and 70 students in the MS program. With the expansion in the computing and information sciences market, we expect to see continued growth at all levels in the program. External funding for the department continues to grow. We are a few years away from our goal of \$5M/year, but we are making excellent progress toward that goal. Finally, we are especially pleased with the support we have received from alumni and friends. Their generous contributions allow us to award at least ten department scholarships each year. In the near future, we hope to have the funds to endow a scholarship in memory of Professor Rex Hurst. Rex's widow Lee Hurst and his children have generously contributed to initiate the endowment. Once we reach the \$30,000 goal, there will be a sufficient corpus to begin awarding a scholarship from the interest each year. Anyone wishing to contribute to that endowment may do so at any time.

Happy New Year

Student Awards and Scholarships

Goldwater Scholar and Scholarship Recipient



Art Mahoney, a senior in Computer Science, was recently named a 2007 Goldwater Scholar. Art is one of twelve students in the computing field nationwide selected for these highly competitive scholarships.

Art was also named a 2006-07 Governor's Scholar, and is a 2007-08 recipient of a Willard L. Eccles Undergraduate Fellowship.

Working as an Undergraduate Research Fellow with **Dr. Dan Watson**, Art says research makes learning more enjoyable. "Programming for a professor's homework assignments during the wee hours of the morning is tedious, stressful and bothersome – but programming for research during the wee hours is fun," he says. Art and Dr. Watson, his faculty mentor, are working on an algorithm that will improve communication among agents, such as robots or a collection of processors, operating in a large network.

Working on your own research project is much more meaningful than learning facts in the classroom, says Mahoney. "With my research I've been forced to solve or work around problems that I would have never dealt with in class – and that's real computer science."

Established by Congress in 1986 to foster and encourage excellence in science and mathematics, the Barry M. Goldwater Scholarship and Excellence in Education Foundation operates an educational scholarship program designed to provide opportunities for American undergraduate students with excellent academic records and outstanding potential.

After graduation, Art plans to pursue graduate studies with the end goal of teaching and researching at a university.

2007 Graduate Research Symposium First Place

John Nicholson, a PhD student in computer science, received First Place at the 2007 USU Graduate Research Symposium for his presentation entitled "ShopTalk: Independent Blind Shopping = Verbal Route Directions + Bar Code Scans."

As part of **Dr. Vladimir Kulyukin's** Computer Science Assistive Technology Laboratory (CSATL), John is working on a software project, called ShopTalk, that will aid the



visually impaired in locating specific products in a retail store.

The ShopTalk device tells the user the the section of shelves and shelf number of a desired product. As the As the shopper navigates to the product, the device reads the bar codes along the shelves to provide feedback to the user. ShopTalk works by reading the bar codes on the shelves and using product information as a way of localizing itself.

Graduate Research Symposium

Second Place

Ranjitha Dhanasekaran, who received her master's in computer science in 2007, received second place for her presentation entitled "Cooption and Irreducibility in Regulatory Networks for Cellular Pattern Development."



Ranjitha's research centers on an elimination procedure called "knock-out" for assessing gene function within genetic regulatory networks. Her research employs a Monte Carlo strategy for eliminating one-by-one every component of a genetic regulatory network until only the essential components remain.

Dr. Nick Flann served as Ranjitha's major professor for her master's. Ranjitha is now working on her PhD in bioinformatics through the Center for Integrated Biosystems at USU.

School of Graduate Studies Dissertation Fellowship

Chaitanya Gharpure received a \$5000 2007-2008 dissertation fellowship from the Graduate School.

As part of Dr. Vladimir Kulyukin's Computer Science Assistive Technology Laboratory (CSATL), Chaitanya's research focuses on an assistive shopping device called RoboCart allows the visually-impaired to shop independently in a large-scale environment such as a supermarket.

The dissertation fellowships provide outstanding doctoral students with financial resources so that they have sufficient time to draft and revise their dissertations.

Chaitanya's award was one of ten given.



Departmental Scholarships

The CS department was pleased to award nine departmental scholarships for the 2007-2008 academic year.

In particular, the CS department wishes to acknowledge the following generous donations that made these scholarships possible.

Steve and Vicki Allan Donated \$2000



\$2000 awarded to Mike Fotes

First Security Donated \$2000



\$1000 awarded to Sunghun Park



\$1000 awarded to Brandon Wright

MDSC Donated \$2500



\$1500 awarded to Elias Taylor



\$1000 awarded to Mike Lee

**Anonymous Sources
Donated \$1000**



\$500 awarded to Luke Galloway



\$500 awarded to
Justin Satterthwaite

Wendall Pope Donated \$750



\$750 awarded to Ben

Space Software Lab

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The Air Force Research Laboratory has sponsored the Responsive Space Testbed initiative to address this problem. Among other goals, this effort seeks to establish a software model that will allow separately-developed software modules and hardware devices to seamlessly coordinate and cooperate using a *Plug & Play* strategy. This model is intended to support a conception-to-launch window of six days for a small tactical or research satellite.

As such, the SDM allows applications to be developed and tested prior to specific knowledge of network configuration, data device specifics or interfaces, or interfaces to its own data consumers. By providing a general mechanism to allow devices and applications to self-configure, the time between mission conception and launch can be significantly reduced.

As a result, the goal of six days between satellite mission concept to launch can be a reality. Hardware and software application modules that have previously been tested against their xTEDS specifications can be rapidly integrated without need for last minute software modifications, hardware adaptations, or wiring harness design.

Alumni

Wes Christensen - BS 1970

In 1966-67, Wes was a junior majoring in physics when the physics department bought a Monroe programmable calculator. It was the size of a suitcase and had the capacity for 44 instructions with no branching. He was so fascinated by the programmability that he went to talk to Rex Hurst in the computer science department. The next day, he transferred over to computer science. He took a job as a night shift computer operator and a year later was “promoted” to system engineer.

Wes graduated in 1970 and took a job with IBM’s Advanced Systems Development Division in Los Gatos, California. He worked for IBM in various software development and management mostly in the Research Division. In 1992, he accepted an early retirement offer when IBM was downsizing.

Wes had gone back the school and earned an MS in psychology from San Jose State in 1989. After leaving IBM, he worked with a management consulting company and then for Family Court as a custody evaluator. In 1997, he left Family Court and started a private practice doing child custody mediation and evaluations.

Wes has always been a software engineer at heart. He is currently working on a software project that he hopes will turn into a Silicon Valley start up company building educational software.

postal stuff

Alumni

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Martin Searcy - MS 1996

After finishing his MS, Searcy went to work for HP in Loveland, Colorado. Two years ago, he moved to somewhat smaller company named Agilent, and then briefly a much smaller company called Verigy, all without changing his worksite. I did change buildings a few times, though, but worked with original HP test-and-measurement product lines all along. Some of his projects have dealt with analog and digital signals in telecom testing, image processing and pattern detection in tomographic X-ray images of solder joints on electronics circuit boards, and optimization of allocation test resources.

Searcy decided to go back to school for another graduate degree in a different area of science. His main

professional and career reasons were so that he could work on physical problems with a scientific approach and use the computer as a tool to address them, a strong and relevant third branch of physics. I also decided that I could make a greater personal contribution to others if the research and/or applications area held greater personal appeal for me, and I've determined that acoustics in physics is that area. He started graduate studies in physics at BYU in Fall 2007.

Shin-Ming Liu - MS 1984

Liu has been doing compiler work at HP since he graduated. He works in the Business Critical Division and manages all compiling for the Itanium processor compiler in HP. The high point of his career, so far, is the invention of the SSAPRE algorithm, the partial redundancy elimination based on SSA form. It has become the standard global optimization algorithm in almost all compilers.

Scott Heiner - BS 1979

Since graduating, Heiner has a lot of varied experiences and worked for a number of terrific companies, notably Evans and Sutherland, computer graphics; Eaton-Kenway, automated warehouses; WICAT, educational software; and the LDS Church, physical facilities and the family history department. Currently, he is the project manager for HotlinkHR (www.HotlinkHR.com), an Internet-based software company for HR management. HotlinkHR emphasizes easy to use software designed to aid companies in keeping a their legal employment and management practices legal. It's especially well-suited for companies that have high turnover, such as car dealers, restaurants, hotels, etc.

We are enormously proud of our alumni, and we want to share with our readers what our alumni are doing. To contact us with information to include in the newsletter email myra.cook@usu.edu