(infinite-loop)

Networking Students Practice System Security Under Fire
Learning about system administration and system security in the classroom is one thing. Applying these ideas in a laboratory setting is another. But what happens when a set of expert crackers takes aim at your systems, running on multiple platforms, with a concentrated attack? A team of UNI CS students found out — and passed the test.

The team — consisting of Andrew Howard, Joshua Hoppes, and Dale Neufeld ’06 — participated in a cyber-defense competition sponsored by Iowa State University in April 2006. The competition simulated the conditions young networking professionals will encounter as IT professionals. The students set up networks to support a range of ordinary business services, such as e-mail and the web. Then, while a neutral team of users accessed these services, a team of crackers from the IT security community launched their attacks, which they prepared independently for weeks in advance.

UNI’s team, with guidance from CS professor Paul Gray, learned of the competition only a few weeks in advance and so had little time to prepare themselves. But through their prior studies, experience, and many hours of work, the team finished second place out of eleven teams. The only team to finish higher had competed in the previous year's contest.

Howard presented on the team’s work to the CNS Advisory Board in October 2006 and described the value of such experiences in their undergraduate education. The department looks forward to sending student teams to future competitions. You can read more about the Networking and System Administration program and the department’s other new majors inside.
Welcome from the Head
We are pleased to send you the inaugural issue of (infinite-loop), our department newsletter. 2006 was an exciting year in the Department of Computer Science. Much of the excitement resulted from news. We moved into a new facility, we completed the first year of several new majors and emphases available to CS students, and several faculty received new grants to support research through the state of Iowa. Even so, much or more of the excitement resulted from the daily and yearly activities that make UNI Computer Science a great place to be: welcoming new students to campus, teaching courses, meeting with alumni and industry partners, and doing computer science.

The last few years have been challenging for departments of computer science everywhere, and that has been true for UNI CS. Cuts in state funding to the university have limited our ability to support student and faculty travel and to equip labs and classrooms in ways that best support student learning and research. Even more difficult has been the nationwide drop in enrollment in computer science, which we too have felt. Enrollments in computing tend to be cyclic, but the drop since 2000 has been particularly steep and slow to reverse course. We see the enrollment challenge as one of getting the word out about what a great time this is to be in computer science — to everyone, but especially to prospective students and their parents.

For those of us in computer science, the lack of interest can be hard to understand, because the discipline remains an exhilarating place to work and to push the boundaries of technology forward. Demand for CS graduates, and especially UNI CS graduates, is increasing. Almost daily the department receives inquiries from companies in Iowa and surrounding states who would like to hire our students. Many of these folks seek our students because they have had such positive experiences working with our alumni! More and more this leads to efforts by companies to partner with the department in various ways.

The steady progression forward of computer science creates a constant challenge that most of us relish: the need to find balance between old and new. Our courses, labs, and equipment must be new and fresh in order to give our students a relevant education. At the same time we must find ways to teach the “old stuff”, the well-understood ideas that are in fact the foundation upon which all the discipline's advances are built. Revising curriculum, creating new programs of study, and working closely with students on current research topics are some of the ways that we try to find that balance.

Thanks to all of you for the many ways in which you support computer science at UNI with your time, talent, and treasure. We will continue to do our best to educate students, to serve the state, and to contribute to the technological advances that make the world a better place — and computer science such an exciting place to be.

Eugene Wallingford, Head

The Department’s New Home

During the summer of 2006, the department moved into its new home in the Innovative Teaching and Technology Center, located in the renovated historic East Gym (pictured above) in the heart of UNI’s picturesque campus. The East Gym first opened for use in 1903, but over the years had been superseded by more modern physical education and athletic training facilities. In response to these changes, the university renovated the building, now known as the ITTC, and converted it into a model, technologically-advanced instructional facility. The Com-
puter Science department was fortunate to be selected to move into space dedicated to digital technology.

Previously, the department shared space in Wright Hall with the Math department, and as the two departments’ needs grew they quickly outpaced the capacity of Wright. The department’s space in the ITTC includes three classrooms, offices for faculty and adjuncts, a laboratory dedicated to the Networking program, the department office, and a conference room. All but one of the classrooms is located on the top floor of the ITTC, with the faculty offices. Students and faculty benefit from wireless networking throughout the building, as well as classrooms that are equipped with wired connections and power for computers. The top floor also offers marvelous views of campus, especially to the west and south.

Computer Science has not made a complete break from Wright Hall or its close association with Math. The CS department retained several spaces in Wright Hall for computing laboratories, including a teaching lab, the Real-Time Embedded Systems Lab, the Software Testing Lab, a bioinformatics lab, and a shared lab for robotics and user interface testing.

New Majors for Students
In the fall 2005, the Department of Computer Science introduced several new curricular offerings. These programs — two majors and an emphasis — aim to provide students with educational experiences leading to contemporary career paths in computing. The skills students develop in these specialized programs are built on top of a solid foundation of academic coursework that prepares students for the inevitable changes in the information technology world.

The department’s new major in Bioinformatics is at the forefront of university curriculum nationwide. It is an interdisciplinary program combining computer science, mathematics, and biology that seeks to explore and elucidate life processes through modern genomic techniques and tools. While there are many graduate degree programs in this area, there are presently only a small handful of undergraduate degree programs. UNI's program is one of the first of its kind. This major contributes to the state of Iowa’s efforts to develop a leading biosciences economy by preparing students for careers in the rapidly expanding biotechnology industries, as well as for graduate study. These careers demand graduates who are conversant across all three disciplines. Our department is able to meet this need better than most, in large part due to the high quality undergraduate science programs available across the College of Natural Sciences.

On Page 1, you read about the accomplishments of students in our new Networking and System Administration major. Offered in conjunction with the Department of Industrial Technology, this interdisciplinary major teaches students skills in system administration and system security that few undergraduates receive anywhere else in the nation. It prepares graduates for careers and research opportunities in a world where the need for scalability and interoperability of services competes with the need of security and reliability. Demand for these graduates is increasing much faster than average, as system administration has evolved into an integral element of every business in an increasingly high tech economy.

Finally, the department created an emphasis in Software Engineering within its B.S. Computer Science program. This emphasis prepares students for careers in the discipline that Money Magazine has called “the No. 1 job in America”. UNI CS has particular strengths in software testing and real-time embedded systems, which enables us to produce graduates ready to participate in critical areas of large software projects, areas often neglected in most undergraduate CS programs.
Alumni Profile: Andrew Drenner

Andrew was a student in the CS department from 1996, when he dual enrolled while in high school, until his graduation with a B.S. in 2001. While here, he was active with the Computer Club, CedarLUG (the local Linux users group), the ACM Programming team, and the system administration team for the College of Natural Sciences. “I was your standard Computer Science student... I would inhale my CS courses and spend most of my free time working in the labs on a number of projects.”

Since then, Andrew has been a Ph.D. student in the Department of Computer Science and Engineering at the University of Minnesota, where he works in the Center for Distributed Robotics. His research falls into two areas. The first aims to build rugged miniature robotic “reconnaissance devices” for use in real-world situations. His team’s work has been successfully field tested with thirty robots used by soldiers on patrol in Iraq. The second area of research, the basis for his thesis, is on a new framework for coordinating large scale multi-robot teams. The goal is to enable future robotic systems to monitor areas that are hazardous to humans for much longer periods of time with much greater precision than any single robot presently can.

Andrew is also a founding member of Recon-Robotics LLC (http://www.reconrobotics.com/), a robotics company that was started to commercialize some of the work done in his robotics lab. As part of his work at the spin-off, he has been involved in a number of collaborative projects, including a state-funded research project with Michael Walter of UNI’s Department of Biology focused on using miniature robotic systems to detect and neutralize harmful biological and chemical agents.

“I owe a great deal of my present success to the inspiration, guidance, and hard work of some excellent faculty at UNI,” Andrew writes. “Many of these faculty have also continued to support me with recommendation letters which have helped me to obtain a number of fellowships including the University of Minnesota’s Incoming Graduate Student Fellowship, the National Science Foundation’s Graduate Research Fellowship, and the University of Minnesota’s Doctoral Dissertation Fellowship. ... There have been many times when I have been thankful for the efforts of some of those faculty.”

Help Us Celebrate...

... the department’s 15th anniversary! In the Fall of 1992, after more than a decade growing within the Math department, the computer science programs at UNI struck out on their own as the Department of Computer Science. In the last fifteen years, the department has continued to evolve and grow. Now is time to celebrate this growth, reconsider the past, and look to the future.

Please join us in the ITTC on the afternoon of Friday, September 21, 2007, when current faculty and students will gather with alumni, emeritus faculty, industry partners, and UNI administrators to celebrate the department’s anniversary. Mark your calendars, and watch the department’s web site for more details this summer.

We Want to Hear From You!

Do you have news that you’d like to share with the UNI CS community? Do you have comments or suggestions for future issues of the newsletter? E-mail us at:

dep@cs.uni.edu

or fill out the contact form on the next page. And be sure to keep up with the department and its activities at:

http://www.cs.uni.edu/
Scholarships and Awards
Join us in congratulating these students, winners of department scholarships in 2006-2007.

CNS Scholarships (nee Symposium Scholarship)
   Ivan Erickson
   Matthew Wemmie

Carl and Wanda Wehner Scholarship
   Jonathan Paisley

Jesse Purdy Scholarship
   Kyle Lieber

Brian Palmer Scholarship
   Rob Rivera

Computer Science Graduate Scholarship
   Mike Volz

Purple and Old Gold Award
   John Van Hemert

Contact Form
Name__________________________
Address________________________
City____________________________
State/Zip_______________________

E-mail__________________________
Class of _______________________

Employer_______________________

News to share:

We Appreciate Your Support
The Department of Computer Science is grateful for all the support we receive from our alumni and from the broader community, whether in time, expertise, or financial contributions. Your gifts help us to deliver the best education possible to the students of UNI, to support them financially and academically, and to engage the people of the Cedar Valley and the state.

Please contact me about:

We welcome your continued support in all forms. If you are inclined to contribute financially to the department, remember that you can designate gifts through the UNI Foundation to the Department of Computer Science, including several existing scholarship funds. You can also send contributions directly to the department.
Visitors at the grand opening of the McLeod Center on November 18, 2006, enjoyed an exhibit of robotics work done at UNI. At the back table, Prof. Ben Schafer of the Department of Computer Science and several of his undergraduate students demonstrate robots that learn their ways through a maze.