The Western student chapter of the Association of Computing Machinery (ACM) continues to be an active and dynamic association. Ongoing activities enable Western students to develop close ties with their peers, as well as maintain relationships with alumni from the Computer Science Department. A good illustration of this strong camaraderie occurred this fall when the Western Computer Science Department hosted the annual Northwest Regional ACM student programming competition sponsored by IBM.

For this year’s event, 102 student competitors representing 34 teams from throughout the west coast gathered in Bellingham on November 4th and 5th. In order to qualify for participation in this challenging, regional competition, CS students participate in local trials for spots on their academic teams. This ACM programming contest is reputed to be exhausting and brain draining, but there is no lack of eager participants. The competition is fierce with only two triumphant teams, but the true reward comes from the companionship with individuals who share common interests.

On the Friday evening before the event, students and coaches met for the ritual sharing of programmer’s basic food group: “Pizza a plenty”. After this get together, students went on their way to practice algorithms or, more likely, to play video games all night long. Early Saturday morning, the competitors met for breakfast, collected t-shirts and reviewed the event rules before tackling the ten questions during an intense day of coding.

The organization of such an event is an intimidating task involving much planning and coordination. The final success of the operation was due largely to the dedication of more than 20 volunteers from the extended Western CS community. In addition to the many CS students who gave their time and energy, a large number of CS alumni jumped at the opportunity to provide their support. These people volunteered a good part of their weekend to supervise labs and equipment, as well as serve food and drinks to participants and coaches. They were also the runners who relayed messages and distributed the colorful helium balloons that are awarded for each successfully completed program.

After a full day in the lab, the students and organizers met for an informal post-contest dinner, sharing compiler and debugger stories while awaiting the official results from the ACM judges in California. Although Western did not make it to the top ten this year, the event kindled the competitive spirit. Next year, the Western students will be better able to practice their skills prior to the competition. In response to student demand, the CS Department has organized a “Programming Competition” seminar to be held in the spring. The goal is to help students master the programming skills required for future regional and national programming competitions.
The Computer Science department is now well settled into its new accommodations and students, faculty and staff are enjoying an excellent work environment. Probably the one feature that we all welcome the most is the laboratory space. In addition to our general purpose laboratories, we have labs for robotics, graphics and animation, distributed and parallel computing, and computer architecture.

During the current academic year we were able to utilize the computer architecture lab to give students hands-on experience in digital logic. Our teaching assistant, Sam Hansen, deserves much of the credit for this. Some of his work is described in the article just below.

This newsletter provides snapshots of activities within the department and several new graduates have given us their views of life as working professionals. We also have reports of some excellent work done by students for their Internet Studies Center internships and by student Alan Ritter on open source software, as part of Google's Summer of Code program. Alan is a truly exceptional student and has been selected by the department as its outstanding graduating senior for the 2005-2006 academic year.

This year, the department hosted the annual Northwest Regional ACM student programming competition. Teams attended from all along the west coast and enjoyed a weekend of congeniality and intellectual exercise. In recognition of the value we place on this small team problem-solving exercise, the department is introducing a new, one credit course in the next academic year to help prepare our students for future contests.

The department has been making some significant changes to its BS program in recent years. Those changes are described in this newsletter, particularly highlighting the new course on computer security.

I hope you enjoy this glimpse of life in the Computer Science department. With the hard work of our faculty and staff, the enthusiasm of our students and the support of our alumni, we look forward to ensuring that this department and its programs can be a matter of pride for us all.

David Bover
CS Department Chair

What’s going on here?

Sam Hansen, a 2005-2006 CS Teaching Assistant explains:

We are testing out a circuit, a simple arithmetic logic unit. Hans stuck around after class to ask me about circuits on a larger scale, how they would operate on a larger system. I’m telling him how it’s one of the components of a modern processor and how it ties in with the other components of the processor. As you can see, it takes a big bunch of wire to make a good connection!

FreeBSD NDIS

Last Summer I ported the FreeBSD NDIS code to NetBSD as part of Google’s Summer of Code program. Google offered stipends of $4,500 to about 800 students in 49 countries to work on open source software. Applying students were required to choose prospective mentoring organizations (NetBSD in my case), who were given $500 for each accepted student.

During spring quarter 2005, I took CSCI 513 (Systems Programming) from Dr. Nelson, in which we wrote device drivers for both NetBSD and Windows. At the end of the quarter he made an announcement in class about the Summer of Code program, and suggested that students who had taken CSCI 513 would be well prepared to work on the NDIS project. I later talked to Dr. Nelson about this and, as he is a NetBSD developer, he offered to be my mentor. I submitted an application which was selected as one of the eight NetBSD Summer of Code projects.

Over the Summer I spent a lot of time working on this project, and ran into many obstacles. Fortunately I was able to get answers to most of my questions on the tech-kern mailing list. It was a bit of a struggle to get the project done on time (by September 1st), but I was able to get a working binary Windows NDIS driver working on NetBSD by the end of the summer. I now have two drivers tested and working, one for a wireless card which NetBSD previously didn’t support. Currently I am working on getting NDIS committed into the NetBSD source tree.

This program was an excellent experience for me. I think Google will do it again this summer, so I would encourage people to find open source projects to work on and apply!

Alan Ritter
**A Bit of Computer Science with Geography**

Correlating and categorizing a stamp collection, as a kid, probably led to my career in computing and interest in geography. Prior to working at Western, I was a research analyst with a grocery chain which dealt primarily with spatial analysis. Spatial analysis is concerned with the quantitative relationship of how people live, work, move, and what they eat. I remember writing my first digitizing application that plotted points (grocery stores) overlaying a scanned image of Seattle on my Mac Plus. What I did not realize at the time is that I had created a crude Geographic Information System (GIS). If I had only sold that idea about 20 years ago, I’d be famous, or at least I could say it was my idea along with a few million other people.

GIS, in short, is a layered world, merging multiple disciplines, such as computing, geography, remote sensing, and mathematics. It's exciting! Every industry will at some point need to use a GIS in order to stay competitive. Industry is only one aspect of GIS. The public sector benefits from the ability to utilize GIS by finding suitable building land, sewer mains, and of course, Starbucks.

Currently, software companies such as Google, Yahoo, Autodesk, Microsoft, Intergraph, ESRI, among many others, are trying to gain market share in the GIS industry. These companies are providing the layering and GPS linkages via cell phones, PDAs and other types of appliances. These systems provide spatial information not only to their customers, but capture location and trending data about their customers. This provides the company with enhanced services. OK, not just enhanced services, but more services for you to buy! Next time you are immersed in a game, think how spatial analysis may have been used to defeat your opponent.

So are there opportunities out there? Yes, and the opportunities will continue to grow, especially for developers/programmers specializing in various languages and application areas. When I went through college, the educators indicated that the hot programming areas were graphics, statistics, and database development. The other major medium that has been added into the mix is connectivity, as in the web. A GIS career deals with all of these specialties and will of course grow. The important thing to remember is that GIS is only a tool and it would be favorable in today’s job market to understand the fields that use GIS on a daily basis and how the data are used.

Matt Paskus, CS Systems Analyst/Mgr.

---

**ACM Student Chapter Annual Picnic**

The Western Washington University ACM Student Chapter Annual Picnic was held at Fairhaven Park in Bellingham. The picnic is an opportunity for faculty and students to meet off campus to share a meal, compete at sports, and have a bit of fun together. The ACM student chapter recognized Dr. Martin Granier as their choice for the 2005 Annual Outstanding Computer Science Instructor Award.
A COURSE ON COMPUTER SECURITY

Modern society is becoming increasingly reliant on computers for so many aspects of day-to-day life: communications, entertainment, personal commerce, as well as employment-related activities. We all enjoy the many benefits of the Internet, but need to be aware that a computer connected to the Internet is accessible and vulnerable to attack from anywhere in the world.

Why would anyone want to attack your home computer? It may be that there is nothing particularly valuable on your home computer, but it could be attacked purely for the challenge; or it could be attacked for use as a platform to launch attacks on other computers. Ten years ago, the subject of computer security was not widely discussed in computer science courses. Now it has become the substance of not just individual courses, but entire degree programs.

In response to suggestions from its external advisory board, the Computer Science department has developed an undergraduate course on computer security. This course, presented for the first time in the winter quarter 2006, is offered as a senior elective in the BS program. The objectives of the course are:

1. Provide students with a solid working knowledge of the major aspects of computer security policy, mechanisms, implementations and assurance.
2. Introduce students to theoretical models of computer security and the implementation of those models in contemporary computer systems.
3. Provide students with practical experience in some aspects of computer security.
4. Arouse students’ interest in computer security which they may develop with graduate studies or in career choices.

The course provides a comprehensive view of computer security, recognizing that security must be treated with an approach similar to that in engineering disciplines. In fact, there is a strong analogy between computer security and software engineering.

- In both disciplines, there is a need to identify requirements. The requirements must be stated in a way that is quantifiable and enables verification.
- Given a set of requirements, the next step is to design the system from a set of inter-related components which together will satisfy those requirements.
- The system components are implemented and tested in isolation and together as a system.
- There need to be established procedures for the use of the system, so that it effectively may meet its requirements.
- There should be reviews of the system’s performance, with feedback to all stages of the development cycle.

The course considers various security models and policies. It then looks at mechanisms for implementation of a security policy, including cryptography, key management, identification and authentication. It gives some coverage of security standards and policy.

An important part of the course is a discussion of security threats, not for the sake of teaching students how they might hack into computer systems, but so that they may be aware of the challenges faced in establishing the security of a computer system.

It is hoped that students taking this course will emerge with a good understanding of the main issues and concerns of computer security, and the techniques, mechanisms and procedures that can be adopted to meet the many challenges posed by the vulnerability of computer systems in a connected world.

David Bover, Department Chair

News from Graduates

Michael Kuroda

Within a few weeks of graduating from WWU in the spring of 2005 I accepted a software engineer position at Mobilisa, located in Port Townsend, WA. Thanks to an earlier graduate student, Ryan Barnard, I was able to get an interview and job offer from them. Since starting work I have gone on a business trip to Washington D.C. and more recently on a decommissioned aircraft carrier. The visit to the aircraft carrier, the USS Ranger, was to perform some tests of wireless network equipment that included testing wireless signal loss over distances and through walls. The future for me looks good at Mobilisa and I am learning a lot. I really enjoy my job and I am getting accustomed to life on the Olympic Peninsula.

Brian Stempel

After graduation, I moved to Colorado and got married in September of 2002. Shortly thereafter, I got a job with Industrial Light & Magic in San Rafael, California (they have since relocated). After about a year, my wife and I moved back to Colorado and I started working for SimAuthor, Inc., a flight simulation company located in Boulder. I worked there for about a year and a half, but then left to join Realtime Technologies, my present employer, to concentrate more on graphics work. From the time I graduated, I was fortunate to be able to move steadily toward the kind of work I wanted to do, and I am certain my education at WWU played a large part in that regard. I have very fond memories of my time at Western Washington University, and I must say I’m slightly envious of those who still have yet to experience it.
Ryan Barnard

Employed as a Software Developer at Mobilisa, Inc., I have been working on various research projects dealing with mobile and wireless technologies. It is very exciting and each day I learn something new. In my spare time, I am working on a couple of personal research projects in the 3D computer graphics field. After graduating I was able to travel to New Zealand to attend a conference and present the paper Dr. Ural and I wrote for my master’s project. My personal website is http://www.nitecrawler.net and my e-mail address is ryan.barnard@gmail.com.

Heidi Young

I am currently working as a Software Design Engineer in Test at Microsoft for MSN Search (soon to be Windows Live!). Initially, after graduation I’d planned to work at a financial hedge fund company writing software for their research department and trade room, but the battle in the Search area right now caused me to head to Microsoft. It’s pretty cool to work for one of the largest most profitable software companies in the world, but be in third place in Search. Everyday is a challenge, but I absolutely love it. Can we win in Search? Hard to say, but I love the fight!

I live in Mercer Island, Washington with my husband (also a computer science alum) Dan, and our cat, Addie. Sadly enough, we love the dreadful weather and plan on taking on the software world in Western Washington by storm someday, so I should be around for a while. Ever inspired to help fellow Computer Science graduates from my school, I’m willing to chat if you need someone to bounce ideas off, share stories, or just go for drinks! Send me e-mail at hyoung@microsoft.com or heidi.young1@comcast.net.

2004 - 2005 Academic Year Awards

Outstanding Graduating Senior
Philip Taron

Computer Science Alumni & Technology Alliance Group Awards
Leroy Miller
Jesse Tobiason
Ethan Whitesel-Jones

David W. Cole Endowment Award
Mark Abersold

Computer Science Department Tuition Awards
Leroy Miller
Jesse Tobiason
Ethan Whitesel-Jones

Kaiser-Borsari Educational Foundation Awards
Matthew Bode
Nathan Kammerzell

Mark Lockwood Memorial Scholarship
Angelika Herbold

Anthony Vallot Jr. Memorial Scholarship
Jesse Tobiason
In the seven years since the establishment of the Internet Studies Center (ISC), more than 300 students have taken advantage of the opportunity to complete web-related internships. For their required internship, students typically get involved in short-term projects with businesses, governmental agencies and non-profits organizations. The variety of internship locations reflects the ingenuity of the students who are encouraged to identify and submit internship proposals within the guidelines of the program.

Students view the internship as a valuable real life work experience that provides not only insight into the professional world, but also a much needed work experience to add to their resumes. Kirk Johnson (class of 2006) interned at a music recording studio called Waveform Music Productions and was asked to create a database driven web site using ASP.NET. For Kirk, “The internship was a great experience that provided me with a real life project that I could put on my resume and show future potential employers. It allowed me to put my knowledge to work and reinforce what I learned from the Internet Studies classes with project management methods that employers will be looking for in an employee.”

Another student, Wilfried Mack spent the summer working for the Washington State Department of Fish and Wildlife in the southwest corner of Washington State. Wilfried’s internship consisted of creating an online database to document, store and disseminate the data collected from private fishing vessels as they enter the port. Data sampled included information about the boats, the fishermen, the number and species of fish caught and released, as well as any other occurrences of wildlife interaction. The ASP website created by Wilfried allows officials from the Department of Fish and Wildlife to review the collected data in an efficient and timely fashion. Wilfried’s supervisor, Wendy Bheegley commented on what “an amazing success the website was” and proposed that next year the effort should be expanded to include neighboring areas such as Westport and Neah Bay.

Students often report how important it was for them to be allowed to explore ways to plan, develop, build and test computerized solutions to real problems, while interacting with users and managers. The positive feedback from his supervisor showed that Wilfried Mack not only enjoyed, but clearly contributed to, his “experience in the real world by being part of a team and helping to improve the efficiency of (existing) operations.”

When Lauren Miller (class of 2005) participated in her internship at the Whatcom County Sheriff’s Traffic Safety Program, she spent the quarter developing an effective way of navigating their Web site, while also adding new informational content and incorporating visual elements. When asked about her internship experience, Lauren does not hesitate. “The internship has proven to be one of the most profound experiences I have had throughout my college career” she says, “In fact, it has been an invaluable experience before graduating from college and heading into a career.” Lauren volunteered, “The internship has been a culmination of everything that I have learned in my Web development courses through the Internet Studies Center’s program (and it) has enabled me to experience how Web development is handled outside of the school environment and develop an interest for pursuing a career in the industry after graduation.”

Internships give students the opportunity to gain hands-on experience, while managing the timelines and tasks associated with their projects. Many students report that they are proud of their accomplishments and that they now feel better prepared for the work world. Empowering the ISC students, so that they are ready and able to contribute to the workplace, is exactly what we are trying to do with the ISC program.

Martin Granier, Director, Internet Studies Center
Curriculum Updates

Striving to Improve the Program

The Computer Science Department is constantly looking for ways to improve its BS and MS programs. Although we believe that both programs are very effective, we regularly seek comments from students, alumni, industry and faculty to identify areas in which further improvements can be made.

In considering changes to the undergraduate curriculum, we keep in mind two objectives, which are sometimes mutually conflicting:

• Keep the program up to date and relevant for our graduates seeking employment opportunities. Computer Science is a rapidly advancing field and we need to ensure that our curriculum is providing students with the skills and knowledge that they need for careers in Information Technology and advancement to graduate school.

• Control the size of the program to ensure that students are able to complete the program in a timely manner. It is easy to add new courses to the curriculum, but we need to ensure that the department has the resources to present those courses and that the program requirements do not become inflated to the point where students are unable to complete within a reasonable time.

In recent years, with the nation-wide downturn in Computer Science enrollments, a third objective has been added:

• Attract and retain students in the Computer Science program. In past years, Computer Science departments experienced a steady growth in student numbers. However, since the “dot-com bust” and the economic downturn, there has been a steady decline in student interest in Computer Science.

New Freshman Courses

Although we may not understand or take effective action on all the reasons for the downturn in student enrollments, there are two factors on which we can have some effect:

• Prospective students do not understand what Computer Science students and professionals actually do.

• Introductory courses tend to be rather bland, as we build up the students’ knowledge and skill sets to the point where they can effectively take on more advanced and interesting topics.

To address these concerns, the department has developed new freshman courses, aimed to provide exposure to some of the more interesting (fun) topics at the front of the program, so that students get a preview of the potential and possibilities of the program and a career in IT.

The new freshman courses are:

Introduction to Computer Game Development, which enables students, with no prior programming experience, to develop computer games. Students use a software package called Game Maker to develop games by menu selection, drag-and-drop and point-and-click. They also get an introduction to programming in a small scripting language and get an understanding of the basic concepts of object-oriented programming.

Introduction to Robotics, which shows students how to design, build and program small robots, using the Lego Mindstorm kits.

Another course is being planned for introduction in the 2006-2007 academic year:

Operation and Configuration of Personal Computer Systems, to instruct students on how to take a “bare bones” personal computer and install and configure the Windows XP and Linux operating systems, along with utility and application software.

New Elective Courses

With the aim of keeping the program up to date, the following new courses have been introduced to the program:

Computer Security providing students with knowledge of the threats and defenses of computer systems.

Computer Animation introducing students to the theory, techniques and tools used for computer-generated animation.

More elective courses are planned for the 2006-2007 academic year:

Software Testing, to give students a comprehensive knowledge and understanding of the tools and techniques used in testing software.

Game Programming, introducing students to modern programming tools and techniques in working with game engines for the development of computer games.

Concurrency, to provide a comprehensive view of the problems, techniques and programming language facilities to enable effective use of multi-threaded and multi-processor architectures.

Programming Workshop, to give small teams of students practice in effective problem solving, in preparation for regional and national programming competitions.
Curriculum Updates

Continued from page 7

Contraining the Size of the Program

With the aim of ensuring that students can complete the BS program in a timely manner, the department has changed the program so that two courses are no longer required, but may be taken as electives. Those courses are “Numerical Computations” and “Discrete Structures and Functional Programming II”.

Further Changes

Some of these changes have already been implemented for the 2005-2006 academic year, others are planned for 2006-2007. However, the program changes do not stop there! Already, faculty are considering further changes to strengthen and streamline the program, for introduction in the 2007-2008 academic year. Of course, those ideas will go through much discussion and debate before they become part of the program.

David Bover
Department Chair