

COMPUTER SCIENCE **News** 2008



WESTERN WASHINGTON UNIVERSITY DEPARTMENT OF COMPUTER SCIENCE

Imagine Cup 2007 in Seoul, Korea

Last spring, almost on a lark, CS majors Brian Thomas, Cameron Hatfield, Alex Luke and others decided to enter a Microsoft programming contest presented by a Microsoft representative at the Association for Computing Machinery Club on campus. The evening that Brian Thomas spent “pumping out code for the online qualifier” eventually landed him on an international team in Microsoft’s Imagine Cup competition, with an all-expenses-paid trip to Seoul, Korea in August.



Left to right: Ziyang Zhou, Malcolm Smith, Alfred Leung with Brian Thomas

Brian’s project, Omni, won first place at the North American regional level, earning a \$12,000 prize and the chance to compete in Seoul. Teammates included Malcolm Smith from Texas A&M; Ziyang Zhou, RPI, China; and Alfred Leung, McGill University, Canada, who managed, with their week long design effort, to capture the North American prize. The theme of the competition was education.

Brian Thomas in Korea for the Imagine Cup Worldwide Finals

Omni was designed “to make web features akin to social networking, such as MySpace, applicable to language learning—based on an Oregon Trail approach, which would allow students with all levels of language abilities to communicate with each other.” Brian explained. Compared with the other teams’ projects, Brian said, “Ours wasn’t very impressive and wasn’t very pretty, but the actual judging was based on how [our] idea solved the problem. It was one of the reasons we did so well, with the concept of language barriers such a cool project to be working on.”

Continued on page 2

Association for Women in Computing

Building a CS Social Network

If you were to ask any computer science student, what is the AWC’s claim of fame, they would likely answer that AWC is the group organizing the very popular weekend CS LAN parties. Although not much homework gets done when the LAN parties are taking place, there is plenty of valuable camaraderie and social interaction, not to mention a ton of pizza. The AWC fame is fine for Samantha Roberts, current president of the Association. “We see the AWC as some kind of a social group” she says, “and we want students to get to know each other and to have a good time.”

During the last LAN party, Rocky Smith brought his X-Box and Megan Ferland brought Nintendo games. With others, they played their favorite games all night: Guitar Hero, Halo 3 and Forza 2 Motorsport. Amanda and Megan, both juniors, were very happy to spend an entire evening playing games with their computer science peers and other friends. Until the wee hours of the morning, they laughed, played, and discovered that the event helps students relax and build strong friendships.

Continued on page 6

CONTENTS

Microsoft Imagine Cup 2007	1
Association for Woman in Computing	1
Letter from the Chair:.....	2
Curriculum 2008 Updates.....	?
Graduate Research: Pedro Huitema.....	?
Senior Projects	:
Faculty Research:	
Dr. James Hearne.....	?
Dr. Geoffrey Matthews.....	?
Dr. Perry Fizanno	?
Awards.....	:

LETTER FROM THE CHAIR



This annual newsletter gives the department an opportunity to keep its alumni, students and friends up to date with department developments and activities.

This year has been a particularly busy one for the department in preparing for its regular ABET accreditation visit and in addressing the findings of the accreditation evaluation team. The outcomes from this activity, described in this newsletter, are most rewarding, with significant improvements to our curriculum and the department's operations in support of its degree programs.

Faculty research is at the heart of our efforts to keep our programs up to date and relevant to students and their potential employers. The descriptions of projects in this newsletter demonstrate the diversity of topics in which faculty are engaged and provide just a sample of the research activity in the department.

The life of the department lies in the project and extra-curricula activities of the students. In this newsletter, we present reports on some senior projects, internships and the wonderful success of our students in the Microsoft Imagine Cup. All of these demonstrate the incredible things that our students can achieve, when given the challenge, the opportunity and some support.

We hope that our alumni, as they read this newsletter will give consideration as to how they may further support the students in our programs and encourage more activities of the type that you see here. We appreciate your support in recognizing student achievements through scholarships and prizes and encourage you to continue help us in providing excellent opportunities for our students as they prepare to join you as computing professionals.

Dr. David Bover
CS Department Chair
Western Washington University

Imagine Cup Continued from page 1

The North American Microsoft awards ceremony in Redmond, WA, in June, was “surreal,” Brian said. “Meeting Bill Gates, being interviewed by Lori Matsukawa [co-anchor of KING-5 news in Seattle] and others, a million flash pictures. I’m now in demand for presentations” including an invitation to the Symposium on CS Education (SIGCSE) conference in Portland in March.

At the international level, it was clear that the other competitors had been investing more effort due to rules that differed for the international regionals,” Brian said. “The quality of the projects really blew me away—there was so much effort put into them.” The Omni team, facing tough competition, was eliminated in the first round, where “all but 12 of the 56 teams were eliminated,” Brian said. But since he and teammate Smith “were the only Americans there, this freed me up to meet people from all over the world...our team got to represent the U.S. and Canada, too!” The team spent their time interacting with international peers and appreciating the sights in Seoul.

What stood out as the most valuable part of the experience? “Brandon Bray, from Microsoft Vis Basic/C++ compiler team, was present for our walk-throughs and gave us all kinds of presentation tips—how to give a presentation, how to phrase information, how to adjust presentation material to, say, my mom,” Brian said.



Cameron Hatfield and his team

Brian thought that Cameron Hatfield's group “had the best presentation—it was technically superior—teaching a programming language.” While Hatfield's project did not place high enough for the world competition, it did receive the award at the national ceremony for best user interface. The CS students from Western all earned free trips to San Jose, CA, to compete in an online challenge to solve problems and earn points. Of the 500 spots available, three of the top spots went to WWU CS majors.



Cameron's team project

During October 2007, the department underwent a full ABET accreditation evaluation of the BS Computer Science program. The evaluation was conducted by a team of three computer science faculty from other institutions, based on information provided in an extensive self-study prepared by this department and an on-site visit to study course materials and conduct interviews with faculty, staff and students.

The outcome of the evaluation was a draft statement which identified several deficiencies, weaknesses and concerns with respect to the evaluation criteria. The department has taken significant actions to address all these issues and substantially improve the program. Much of the change is to the department's operating policies and procedures, revising and formalizing current practices on faculty travel and supervision of temporary faculty. Most significantly, the department has further revised its procedures for assessment and improvement of the program, an area in which ABET's interpretation of the criteria has changed significantly over the years, with further change expected in future years.

The ABET draft statement raised some issues related to the curriculum. Some of those, concerning the amount of mathematics and science in the curriculum, simply required some tightening of the degree requirements, without any change to current practice. However, more extensive action was required to address a perceived deficiency in training in problem analysis and solution design. In response to this deficiency, the department is replacing three existing required courses: CSCI 341 "Object-Oriented Programming in C++", CSCI 344 "Software Engineering" and CSCI 496 "Senior Project" with three new required courses CSCI 491 "Software Project Requirements Analysis", CSCI 492 "Software Project Design", and CSCI 493 "Software Project Implementation". The new courses will enable students to more completely explore the concepts of analysis and design, as well as other software engineering practices in the context of large projects. This also provides an opportunity for expansion of students' experience in working in project teams. Faculty and students are excited about this change, which will be phased in during the 2008-2009 academic year, as we can all see that it will bring significant improvements to the program.

Another area of concern for ABET was the department's lack of funding for replacement of its laboratory computers. Although the department was fortunate to receive a generous capital budget allocation when it moved into its new location in the Communications Facility in 2004, the computers purchased at that time are now all out of warranty and need to be replaced. The department's existing lab fee, while sufficient for maintenance, repairs and purchase of consumables, is hopelessly inadequate for replacement of computers in our vastly expanded facility. In response to this concern, the department has applied for a new fee, specifically for computer replacement. That application has been approved, but is still subject to final ratification. The department regrets the need to pass this cost onto its students, but in the absence of sufficient state funding or donations, we have no alternative way to avoid obsolescence in our computer laboratories.

ABET accreditation is an exhausting process for everyone in the department. However, the rewards for all that effort are great, in identifying areas of improvement and in ensuring that our program enjoys continued recognition for quality, in comparison to programs all across the nation.

GRADUATE STUDENT INTERNSHIP

The Path to a Professional Career

Immediately following completion of his Bachelor of Science in Computer Science, Pedro Huitema (Class of 07) participated in an internship at Weyerhaeuser in Federal Way, Washington. Here is what he told us about his experience:



Upon graduation, I started working at Weyerhaeuser as an intern in early summer 2007. I immediately got involved in the deployment of a new enterprise search engine (Autonomy IDOL). To complete my tasks, I needed to familiarize myself with the engine and its various configuration settings. I had to develop applications to handle various indexing tasks, including the web front end, in order to output search results. This major assignment involved both coding (in C# on ASP.Net) and configuration.

Continued on page 8

FACULTY RESEARCH HIGHLIGHTS

From AI to Games...

Dr. Matthews is working on a book on computer game development, and a textbook for CS game theory.

Dr. Geoffrey Matthews has worked for a long time in the field of artificial intelligence. He is particularly intrigued by machine learning, and the potential for software to become a useful apprentice in scientific investigation. To this end, he works closely with his wife, Dr. Robin Matthews, the Director of the Institute for Watershed Studies at Western. Together they monitor the water quality for the city of Bellingham, and carry out research in lake and stream studies. They also support a number of Western faculty and students working on freshwater problems, and regularly consult for the city of Bellingham and the Washington State Department of Ecology.



Scientific data fascinates Dr. Matthews and he has developed original algorithms and implementations to analyze and visualize scientific data. His interest in the visualization of scientific data led him deeper into the field of computer graphics. Today, he enjoys developing computer graphics as demonstrated by a large project involving the development of realistic worlds from noise functions. Fractal mountains and trees have long been a staple of computer graphics, creating worlds that look like they were created from natural processes. Dr. Matthews is trying to create a new kind of hybrid system by incorporating both

order and disorder, to populate such computer-generated worlds with computer-generated artifacts that look like they were created by human processes: houses, buildings, bridges, towers, castles, cathedrals. Two of his graduate students, Kevin Colyar and Bret Hall, have had papers in this area accepted at SIGGRAPH, the largest and most prestigious conference on computer graphics anywhere.



Dr. Matthews responded to a recent push to incorporate computer game programming into the CS curriculum by developing our first upper level games class, Game Programming CSCI 321. Microsoft, which saw promoting computer games as a way to boost enrollment in computer science, was eager to encourage the trend. A couple of years ago, the company invited Dr. Matthews to attend a conference on games in the curriculum that was hosted aboard a cruise ship to Cozumel, Mexico. On the cruise, he met famous people in the computer games world, such as Ken Perlin and John Laird. Dr. Matthews happily recalls, "It was an amazing experience, an entire ship full of computer geeks. When it was written up by Forbes magazine, the headline read *The Nerd Boat*."

Aside from being the most enjoyable conference he ever attended, it also opened his eyes to the potential for research on computer games. Currently Dr. Matthews is working on a project to develop real-time versions of his noise-generated structures, programmed on the graphics board of computers and console systems that would be suitable for use in games.

The Institute for Watershed Studies at Western Washington University conducts a variety of water quality analyses. The Institute supports research on freshwater lakes, streams, and wetlands by providing training, supervision of student projects, assistance with program development, and by sponsoring seminars and presenting guest lectures on a wide range of topics relating to watershed studies. Projects involve local water quality issues and community service.

Back to China...

Dr. James Hearne continues his work on computational linguistics and will study syntactic phenomena of classical Chinese in Beijing, China during spring 2009.

Human language is the very complex system that allows us to communicate, exchange ideas, share knowledge, and express feelings. As such, it is probably one of the most important human characteristics. It is both the complexity and the importance of language that have attracted Dr. Jim Hearne to the field of Linguistics, the foundation for the scientific study of human language.

Dr. Hearne's studied linguistics at the University of XXX and completed his Ph.D. dissertation (title/location). Over the years, he has done extensive research in areas such as machine-readable context-free grammar of English and implementing genetic parsing algorithms. Recently, however, he has started to study some particularities of Chinese, a language that possesses unique linguistic characteristics. "Classical Chinese allows a large variety of ways to juxtapose words," explains Dr. Hearne. "In that language, the rules governing the coordination and subordination of words and elements of sentences are a lot less rigorous than in other languages."

Chinese text

Researchers have observed for long time that Chinese has some unique structural properties when compared to other languages such as English or French. The language has a considerable complexity, but the structure of Chinese is quite flexible and thus provides Chinese writers with many opportunities. Centuries ago, games were developed taking advantage of the fact that Chinese wordsmiths can create interesting combinations of words. It is possible to rearrange texts in a number of ways, allowing authors to align words vertically, horizontally, or diagonally, in order to provide structural effect, while preserving the integrity and meaning of the sentences. Even with a small number of words, language experts sometimes compete to see how to form as many combinations as they can up, down and across the page.

Of course, such complex variations are not possible in English, but it is possible in classical Chinese, because, generally speaking, the grammatical structure of the language is very loose and flexible compared to English. As an example, English has strict rules governing the use of relative clauses. A relative clause uses the "relative" pronouns which, who, and that, in order to relate one clause to another as in "the man who went to the restaurant which is downtown." Chinese does not have to obey to such constraints, and by not having such stringent requirements, the Chinese language allows a wider range of word combinations. The combination of words in classical Chinese is exactly what Dr. Hearne wants to study. "I am trying to find new ways to look at the language. In linguistics, a corpus (plural corpora) is a large, structured collection of text used to do statistical analysis, checking or validating various linguistic rules. Now that huge corpora exist and are available, I can use computers as a tool to study the language," he explains.

To pursue this field of study, in the spring of 2009 Dr. Hearne will take a sabbatical at Tsing Wu University in Beijing. Having lived in China in 19xx while teaching at XXX, Dr. Hearne is fluent in Cantonese and is very excited to go back to China for few months. The main challenge for him will not be cultural, but it will be in finding answers to the syntactic questions he is posing. By going to Tsing Wu University, a school often referred as the Chinese MIT, he will be able to work with other people interested in studying the same topic. "Computational Linguistics is not a big field of research right now," says Dr. Hearne, but while working at Tsing Wu University, he will be able to benefit from being right where the current investigation is taking place and enjoy an opportunity to immerse himself in the Chinese culture and language.



Tsing Wu
University

Senior Projects Article by Chris Reedy

One of the last requirements a Computer Science major needs to meet prior to graduation is the development of a “Senior Project.” The Senior Project class (CSCI 496) requires students to work in teams on an intensive software development project including requirements, design, implementation, testing, and documentation. The following describes two senior projects from the 2008 graduating class.

Project #1 (TBD)

Project #2 (TBD)

Association for Woman in Computing Continued from page 1



Amanda recalls the days before joining the AWC, “Because I came originally from the Journalism department, I was a bit disoriented during my first term studying programming. But events organized by the AWC helped me make friends quickly, and I feel like I have received a lot of support from my peers in computer science.” The benefits, however, go both ways, because AWC members also give a lot of themselves. They serve as mentors to freshmen, give presentations, create support groups and occasionally, they even do some outreach with local schools.

Above all, the AWC is about helping students and encouraging them to get to know their peers. “Students have a tendency to work in isolation,” says Megan, “working on their assignments by themselves.” After joining the AWC, Amanda really felt that she became part of the group. “Now, I really enjoy the time spent with my friends in the computer labs. We have a lot of fun in that lab” says Amanda. It is a lot easier to create this kind of atmosphere when the same lab which offers challenges, has also offered relaxation and fun through all-night sessions of video games!

Outstanding CS Graduate

Sarah S. Breggin

WWU Presidential Scholar

Roseanna Rey

CS Department Citizenship Award

Phillip Nordwall

CS Department Tuition Awards

Chris Antes

Rod Lacour

LeRoy Miller

Kaiser-Borsari Educational Foundation Awards

Mitch Rosenberg

Matthew Zeilenga

David W. Cole Endowment Awards

Daven Hiskey

Mark Lockwood Memorial Scholarship

Brandi Williams

Anthony Vallot Jr. Memorial Scholarship

Rod Lacour

Boeing Award

Nathan Kammerzell

David Massey / Microsoft Award

Brodie Lee

L. & E. Guisti Award

Chris Antes

Alumni, Friends & Tech Alliance Group Award

Matthew Ferry

2007 OUTSTANDING INSTRUCTOR



I was also asked to create ISAPI filters to redirect HTTP traffic from various internal Web sites based on various conditions. This particular project, took a considerable amount of time to code, and I used C++ in this case, but I also had to create and maintain various “portlets”, which are mini web applications that run in the enterprise portal. I have other tasks (such as working on a few forms for the new version of the Weyerhaeuser public web site (Weyerhaeuser.com), and when not busy with other projects, I help maintain a couple of internal Web sites. Overall, I find the work varied and very interesting.

Other students have asked me, “What is the biggest difference between being an intern and working on class assignments?” I tell them that for me, the ability to negotiate deadlines is the most striking difference. Because of the number of tasks a developer is involved with, and the various priorities he has to juggle, it is often necessary to adjust one’s schedule. The “Web service” group where I work, has about 40 people (including developers, analysts, testers, support...), so these ongoing interactions require an employee to be flexible and responsive. For me, I find that the need to interact with many people all the time is one of the most exciting aspects of the job.

In January 2008, Pedro came back to Western to work on his Master’s degree in Computer Sciences, while continuing to work part-time with Weyerhaeuser. After completion of his graduate studies, Pedro intends to return full-time to Weyerhaeuser, where he finds the environment and his colleagues a great place to work.

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