Greetings… and welcome to our first official Computer Science program newsletter! I’ve had creating a newsletter on the to-do list since becoming chair in Fall 2006, but have simply been overwhelmed by the blizzard of challenges and new initiatives we’ve tackled since then. Keeping our friends and alumni in the loop is important to us all, however, so we finally decided to share the load by each contributing an “article” about something that we’ve been working on or are excited about.

There have been so many changes in the last few years that it’s hard to know where to start. After a difficult period between 2000-2005, in which we digested a series of departures, retirements, budget challenges, and temporary relocation to an old dorm during a remodel, the Computer Science department emerged vibrant and stronger than ever, with energetic new faculty members, a new building, and a strong university administration. We took full advantage of these circumstances over the last few years, establishing of a vibrant new student community, developing exciting new courses, and launching a graduate program.

I think that those of you who, like myself, are alumni of the NAU-CS program will be surprised and pleased at where we’ve taken the program: we’ve kept the personal touch and close faculty-student relationships that NAU-CS has always been famous for… and have built on this to create a more vibrant, technically-advanced program than ever. Some key highlights include the fully revitalized ACM chapter as a cornerstone of a “club” for our majors, our two new degree programs (B.S. in Applied Computer Science and M.S. in Engineering graduate program), hiring of four new faculty members with cutting edge interests, and full re-accreditation (with flying colors) of our core gold-standard B.S. in C.S. program.

As you can see, we’ve been incredibly busy over the last few years, but the effort has paid off: enrollments have

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grown in double digit percentages in each of the last two years as our visibility and reputation grows, and our faculty team has grown into a fun and effective working group.

On the gloomier side, you may have heard that the nationwide budget crisis has hit Arizona particularly hard, resulting in devastating cuts to the higher education system. While this is forcing some difficult and very unpleasant choices, I can assure you that we are doing everything we can to insulate our students and the quality of our programs from the negative consequences, e.g., re-arranging faculty workload and scholarly priorities to ensure that we can offer all courses needed by students to make smooth progress towards graduation. Of course, you can't draw on “reserve power” forever, and we are all hoping for a speedy recovery to avoid permanent damage to faculty research agendas and overall departmental viability.

Okay, enough for now. I hope you enjoy our newsletter; it's something that we hope to get out on an annual or bi-annual basis in the future to keep you all in the loop. If you are ever in the area or passing through Flagstaff, please do send me a note or give a call. We are always happy to reconnect with our friends and alums!

All the best in 2009,

Eck Doerry, Chair

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**CS Careers**

*by Steve Jacobs, Adjunct Professor*

“High salaries and plenty of jobs abound for recent computer science degree grads, according to a recent article on ComputerWorld.com” [1]. Even in our complex 2009 economy, careers exist for computer science grads.

Many of the technologies of day-to-day living require implementation via software, whether it be complex aviation systems or information systems applications, there is still a requirement for CS grads in the workforce. Many companies now supplement or even replace on-campus recruiting with their own career web sites.

Recruiters often use sophisticated web crawlers to search for on-line, posted resumes on job boards such as monster.com and dice.com. Make sure you take advantage of NAU-provided resources to aid you in your job search, such as seminars (resume writing, interview techniques, etc.) and campus recruiting events. Get a hold of the “Job Search Guide 2008-2009” from the NAU Gateway Student Success Center.

Keep in mind many of the jobs may not be precisely what you hoped for – for example, you may be asked to develop software in C++ when you really wanted to do Java, or you may be asked to upgrade a web site using web development tools when you really wanted to build database applications, or you may be asked to maintain (i.e. enhance or improve) a large portion of existing, operational code. The key to success in the marketplace is the willingness to learn new things and take on new challenges. Your learning does not stop at NAU. You will be learning new skills and applications on the job.

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**Graduate Program Update**

*by Dr. Deiter Otte*

Now Computer Science has a Master’s program! Starting last fall, our “Master of Science in Engineering/Computer Science” has a disciplinary focus on Scientific Computing. This flexible program concentrates on interdisciplinary research and allows prospective students to choose from a variety of interesting courses within Computer Science as well as other Engineering disciplines and the Natural Sciences.

Currently there are 4 full time and one part time students enrolled. Come and check out our web site: [http://www.cefns.nau.edu/Academic/CS/graduate/](http://www.cefns.nau.edu/Academic/CS/graduate/)

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**What is NAU ACM?**

*by Leah Shanker, CS Major and NAU ACM President*

NAU ACM club is Northern Arizona University’s Association for Computing Machinery. The club is highly dedicated to educating its members about upcoming computing technology, hosting weekly “Demo & A Movie” events which feature a tech demo and a geeky movie. Our aim is to create a friendly, approachable atmosphere where computer geeks can talk shop with like minds.

Some of our previous projects include hosting Digital Carnivals (gaming events) for which we build custom scoring software for tournament ranks, building the ACM (Cont. on Page 3)
WHAT IS NAU ACM
(cont.)

Game Cabinet on display near the front entrance of the Engineering building (which features playable versions of NAU CS student-created video games) and competing in regional collegiate programming competitions. We also hold our once-per-semester Computer Science BBQ Social, where the professors and students can get to know each other while enjoying some delicious food.

We hold our weekly meetings in Room 105, at 6:00PM during the regular semester. We've also got a newly-rebuilt website up where announcements are made, information is available and discussions take place: http://www.nau.edu/acm

Come by a meeting or check out our website to join!

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PLEASE TRY OUR GAME CABINET IN THE ATRIUM OF THE ENGINEERING BUILDING 69.

ALL COMERS ARE INVITED TO SAMPLE GAMES PRODUCED BY NAU CS MAJORS!

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NAU CS DEPT NEWSLETTER INTERVIEW WITH

DR. JOHN GEORGAS

Dr. John Georgas joined the Computer Science department in Fall 2008, after graduating from the University of California, Irvine. We caught up with him between classes, and pinned him down for a short interview.

What is your academic area of interest and expertise?
My work is focused primarily in software engineering, in studying how software developers design and build systems, and how these practices can be improved. More specifically, I am focused on self-adaptive software architectures, which address the challenge of designing runtime adaptive systems through the use of explicit models of interconnected software components. Lately, I have also taken an interest in robotic systems and how the software that controls these systems is built. Hopefully, you’ll be seeing robots run around the hallways soon!

Which classes in the curriculum are you teaching?
For my first two semesters, I have been teaching CS 136, which is the second semester introductory computer science course. I've also offered an upper-division elective course on software architecture and am currently teaching principles of programming languages (CS 396). I really enjoy the mix of students these classes let me meet: I get to teach students in their first or second year, but also get to meet students just about to graduate.

What is it about teaching you find most enjoyable and most challenging?
The most enjoyable thing is also the most challenging: Getting students actively engaged with the material being discussed in class. I really prefer it when class time is based on interaction with students and lively discussion, rather than a dry lecture from me.
I try very hard to engage students actively and also try to promote students interacting with each other through team activities. It takes some doing sometimes, but it’s absolutely great when everything finally “clicks” into place and the class turns into an interactive question, answer, and discussion time.

How do you see the department changing in the next 5 years?
I think the next 5 years will be a very exciting time for the CS department at NAU. Probably the most exciting thing is the new Master of Science in Engineering (MSE) degree that is growing fast.

(Cont. on Page 4)
John Georgas (cont.)

This is a really great development for all students in the department: With graduate students will come a great deal more opportunities for undergraduate students to work on research projects and a new set of graduate courses that upper-division students can take, which will only improve the quality of education our students receive. It also provides a fast-track path to a master’s degree for our undergraduate students that want to continue on to graduate school, since you can count some of your upper-division electives for graduate credits.

There’s also a new undergraduate degree program in the works that you’ll hear all about very soon! Despite all the difficulties the country is facing, the department is really poised to grow and improve in very tangible and substantial ways.

What led you to pursue a faculty position at NAU?
For me, the Computer Science department here was a great fit: It was just the right size, as I feel that a lot of collegiality and teaching quality is lost in larger departments. The department was also looking to expand its software engineering core, and that was also a great fit with my interests. Finally, Flagstaff is just beautiful: Both my wife and I felt very strongly about staying in the Western part of the country, and the small-town feel, wonderful weather, and clean air of Flagstaff beat out the competition.

Tell us a bit about yourself: Where are you originally from? What do you like to do with your free time?
Originally, I was born in California, but spent most of my childhood in Greece (both my parents are Greek), and came back to the US in 1993. I spend most of my (little) free time with my wife Jessica: We take hikes and walks to enjoy the weather and trees, and just spend time together.

Women in Computing by Dr. Dan Li

CS faculty recently had an interesting discussion on the topic of “Women in Computing”. This discussion brought me back to early 1990s when I was an undergraduate student in China. I asked myself “You have been in the field of Computer Science for almost twenty years. Have you ever thought CS is a major particularly designed for men?” My answer was quick and easy “No”. Women made up 40 percent of the students who majored in Computer Science when I was at school.

This percentage was much higher than all other engineering disciplines such as Mechanical Engineering, Civil Engineering, and Electrical Engineering. The number is about the same for recent years based on CACM [2] – “In Asia, women earned 43% of first university degrees in math and CS in 2004”. Then the question is “why what we have here in the U.S. is so different from what we have in China?”

The reason I could think of is the culture difference. In China, pragmatic factors (employability, the image of CS as a pragmatic choice among science and engineering-related fields) used to dominate the choice of major, while most of the U.S. students choose their majors mostly based on their interests. Even for Americans, reason for becoming interested in computer science and selecting it as a major differs from gender. Based on a report [3], while all the men interviewed cited a number of other factors (notably games, classes, and the influence of peers) for their initial attachment, interest alone was the primary driver of their decisions to major in CS. American women, while also citing intrinsic interest as a motivator, rank other factors high among reasons for majoring.

Widening Gap

The percentage of female college freshmen who list computer science as a probable major is 0.3 percent, down from 4.2 percent in 1982.

These factors include class experiences and their sense of the promise of the field and its future. Some women describe concerns and/or unhappiness about the male environment, and some women describe their fear, dislike, and intense anxiety in programming. As a large fraction of the CS experience in the first year is programming, many students adopt the conclusion that programming is the be-all and the end-all, even though they may realize later in their Junior and Senior years that Computer Science is more than programming.
**China 1-2-1 Program**

**By Dr. Kefei Wang**

The Chinese 1+2+1 Partnership Program is facilitated through the China Center for International Educational Exchange (CCIEE) [http://www.cciee.com.cn](http://www.cciee.com.cn), and the American Association of State Colleges and Universities (AASCU) [http://www.aascu.org](http://www.aascu.org) in collaboration with Northern Arizona University.

Students enrolled in the China 1+2+1 Partnership Program will spend a year at a Chinese university, study at NAU for two years and return to the institution in China for their final year. After completing all program requirements at both institutions, students will receive bachelor's degrees from NAU and the institution in China.

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Yi Feng, from Tech University of Lanzhou, China is also an NAU CS Major; he will end up with degrees from both institutions.

In January 2009, we welcomed our first China 1+2+1 students to the Department. “1+2+1 is terrific, it gives undergraduate students a meaningful international experience, proficiency in English and an opportunity to earn a degree from an American university without having to pay international student tuition for the full four years” Yi Feng said, who is from Tech University of Lanzhou, China, "The BSACS program here is a wonderful program to me, the facilities are good, my classmates are good, and my professors are all good, and I really enjoy the small-class environment here."

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**So You Want to Make Games: Choosing Your Major and Your School.**

**By Abe Pralle, CS Lecturer**

A lot of us get into Computer Science because we want to make video games - I certainly did. Let's take a look at some of the most frequently asked questions about making games and higher education.

**Q: I want to make video games. Is Computer Science the right choice?**

To make video games you need game designers and game programmers. If you want to be a game programmer then CS is definitely the right choice. Turns out a lot of people actually want to be game designers; they just don't realize it at first. If you enjoy analyzing what makes games fun, interesting, tedious, or boring and you don't like programming then you might consider a school that specializes in game design such as DigiPen.

**Q: If I want to be a game programmer shouldn't I just go to DigiPen or a similar school?**

There's nothing fundamentally different about game programming than any other kind of programming. A CS degree from a university like NAU will certainly give you a well-rounded education, solid programming skills, and an understanding of CS theory that will enable you to confidently tackle any challenges you wish – not just the ones you've been shown techniques for at a trade school. DigiPen looks to be a fine school that is a more direct pipeline into the games industry – but you also have to weigh the cost, the distance, and the question of how versatile a programmer you want to be.

**Q: C'mon, better game programmers probably come from DigiPen.**

A friend of mine and I programmed Top Spin 2 tennis for cell phones some years back. The code reviewers said it was the most well-structured and maintainable code they'd ever seen. Two other friends of mine – Jacob and Paul Stevens of RiverMan Media – have released three solid indie games over the last three years (Cash Cow and Primate Panic for the PC and MadStone for the Wii). To date there's never been a bug discovered in any of their games. We're all NAU alumni.
**Research Spotlight**

**By Dr. James Palmer**

Even as Bureau of Labor Statistics predictions indicate unprecedented demand for software engineers in the next five years, interest in computer science remains stagnant and nationwide retention rates of incoming majors are alarmingly low. Nationwide, CS enrollment is half of what it was in 2000 and Drop-Fail-or-Withdraw rates for a first course in computing commonly hover between 35% and 50%. Computer science educators are being forced to improve the way in which the discipline is presented to students, and increase retention during the critical first year of study.

The NAU Computer Science department has been actively working to reverse this negative trend through new classes and innovative new course material. Part of our effort to change the fortunes of incoming freshmen has been the development of JavaGrinder, an innovative web-based platform that emphasizes problem solving, solid software engineering practices, and teamwork while presenting computer science as an exciting multidisciplinary field, rather than as an abstract world of syntax and arcane codes.

JavaGrinder enables students to work through “bite-sized” problems that emphasize computer science concepts in real-world contexts and teaches true Java programming, while shielding learners from excess language and platform-specific minutiae. With an emphasis on teamwork and problem solving, JavaGrinder attempts to develop CS and software engineering skills as well as an appreciation for the kinds of problems that Computer Scientists work on and the many career paths available to computing professionals.

**Outstanding Faculty Who Care**

The Computer Science faculty has varying professional specialties, but all are united by a strong commitment to teaching. Among the special interests of the faculty are Groupware Systems and Intelligent Interfaces (Doerry), Data Mining (Li), Optical Networks and Security (Wang), Graphics and Computational Geometry (Palmer), Distributed Systems and Web Technologies (Otte), Software Engineering and Robotics (Georgas), and Games and Virtual Worlds (Pralle).

Please come see us anytime, make an appointment, ask questions, try our interesting classes, sponsor a project, make a donation, join NAU ACM, tell a friend. There a many ways to get involved.

See more about our program at: [http://www.cefns.nau.edu/Academic/CS/](http://www.cefns.nau.edu/Academic/CS/)

**References**


