MESSAGE FROM THE CHAIR

The month of September here in Missoula was a beautiful backdrop for the start of another busy year. We welcomed back a number of faculty members who have been out of the office for a while. Jesse Johnson returns from an eventful year abroad with his family in Cape Town, South Africa; Alden Wright brings news from his semester at the University of Otago, New Zealand; and Ray Ford rejoins the CS faculty fulltime as his tenure as University CIO comes to an end. It is rare to see Joel Henry without one of his substantial law books in tow as he continues to make terrific progress towards completing his degree. Min Chen had a busy summer attending two conferences and visiting with her family in China, while the rest of us stayed closer to home working and enjoying the incomparable summers of Montana.

We all look forward to a productive year and are particularly excited by a number of new initiatives. Taking cues from a recent meeting of our Advisory Board, the faculty are re-examining current curriculum to see how we can draw in more students with potential interdisciplinary interests. After a very successful pilot offering of game programming summer camp (highlighted in this newsletter), we look to expand offerings next year. We continue to develop strong corporate relationships that have direct impact on our students, and we are eager to lead an expansion of the Global Research Network Operation Center (GNOC) internship program at Indiana University. The rest of this newsletter is dedicated to interviews of faculty and students as they tell us more about some of these opportunities. As always, we love to hear from you—whether passing through Missoula or crossing channels via email—so do keep in touch and have a wonderful fall!

~ Yolanda Reimer

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MICHAEL CASSENS IS A LECTURER FOR THE COMPUTER SCIENCE DEPT AND TEACHES CSCI 135, 136 AND 232 THIS SEMESTER. LAST SUMMER HE ORGANIZED AND TAUGHT AN ANDROID GAME PROGRAMMING CAMP FOR KIDS.

Describe your experience teaching kids how to program Android phones.

Teaching middle school children was a new experience for me. Honestly, I was a little nervous because I wasn’t sure they were going to enjoy the camp. However, bringing kids together to play and learn about games for a week – I am not sure why I worried so much. Their enthusiasm was infectious, and their ability to learn the concepts was phenomenal. I was in awe of what they were able to accomplish in such a short time period.

On a personal level, what did you take away from this experience?

It was an inspiring experience for me. I know it is cliché, but I really learned the most from the kids themselves, and they really motivated me. Also, I was so thankful to be able to work and learn with instructors from SpectrUM as well as with my student intern. They were absolutely critical, and the camp would not have been a success without them.
Would you recommend getting involved in this Android Programming Summer camp to others? Why or why not?

Yes, of course. I think this camp provides a glimpse of what you can do as a Computer Scientist and have fun while doing it. It creates a forum where different age groups are able to find common ground between them and form friendships that might not otherwise happen.

What is the single most important thing that you would hope staff or volunteers of this summer program would take away?

I hope that the staff and volunteers were able to see how incredible our youth are. I want them to be excited about the potential that these kids possess. Finally, I hope they realize just how much of a difference they made in these kids’ lives.

“This camp provides a glimpse of what you can do as a Computer Scientist, and have fun while doing it.”

What do you think is going to be the role of cell-phone based programming and software in the twenty first century?

This will be one of most critical areas of software development in the near future. Trends have already shown that more and more consumers are using their phones for their everyday computing needs. As phone hardware and connection speeds continue to advance, I think we will see more people start to abandon their laptops and desktops in favor of their phones.

This means that as computer scientists, we will need to be even more aware of these devices and how to develop not only useful software for them, but efficient software. I see cell-phone based programming as way to get back to our roots as developers. I see us becoming more aware of the hardware limitations forcing us to be much more conscientious of our resources resulting in better applications for consumers as a whole.
Android currently has the largest market share of smart phones in the world. Do you expect this trend to continue?

It's hard to compare operating systems on an apples-to-apples basis. Essentially, you are looking at the Android operating system versus the iOS operating system developed by Apple. The other operating systems have a fairly insignificant market share at this time. The trouble in comparing the two leaders is that Android is distributed on multiple devices developed by multiple manufacturers whereas iOS is distributed and developed on just Apple devices. Therefore, the Android operating system will most likely continue to expand at an exponential rate because they have more vendors.

“As phone hardware and connection speeds continue to advance, I think we will see more people start to abandon their laptops and desktops in favor of their phones.”

Where would you like to see the most improvement in children’s education today?

If it were up to me, I would suggest we focus more not only mathematics and science, but also critical thinking, problem solving and innovative thinking. I think these are skills that must be practiced just like spelling and reading. I think if they were to focus more on these concepts, our kids would come out of high school with many more options.

What do you think the importance of Computer Science is in the education system today?

Computer Science is absolutely critical. For me, it’s always about exposure and opportunity. If students are not exposed to Computer Science, they might not know the opportunities that await them in this field. Our goal as educators should be to find and encourage talented and motivated students to excel in fields like Computer Science. Computer Science is not an abstract idea any longer. It exists throughout our society and if our students are well-versed in this area, our society benefits as a whole.

Describe some of the things that the kids learned about the Android Programming Platform.

It was interesting because at first I think parents wondered if their children were just “playing games” all day. In some ways, they were. However, I wanted them to look at gaming in a whole new way. I wanted them to look at gaming with a critical eye instead of just as a consumer. So, I had them first explore which games they liked to play. It’s important for anyone creating games to know what kinds of games they actually like before they build their own. If they don’t like the game, it’s incredibly difficult for others to enjoy it too.

After they played a number of different games, I had them share their choices with the group and explain what it was about the game that they liked. Since there are so many game choices out there, this gave the kids a chance to learn about games they had not played before. After identifying which games they were interested in, I had them look at their collection of games as a whole and identify the common characteristics between all the games. They used this information to ensure that these aspects were integrated into their own game.
How do you see this internship affecting your career as a computer scientist?

The group that I worked with - Research Technologies - seemed pleased with my work, and asked me to send them a resume when I graduated. Thus, this internship may represent a START for my career as a computer scientist!

What did you learn about this industry during your internship in Indiana?

Networking requires people with all kinds of skills, from hard-core programmers to sysadmins to fiber optic technicians to helpdesk staff. Probably the common thread linking these different disciplines is the level of excellence required from each individual person: people in this industry are generally pretty good at what they do.

Describe the day-to-day activities of your internship.

On a typical day, I'd wake up, ride my bike to work, and clock in between 8:00 am and 9:00 am. Then, I'd open up a couple of terminal windows and SSH into the development machines I was using to test my project (these machines lived in Indianapolis). I'd spend a while picking through code, looking for the important sections, then I'd make a change and re-build the executables of the project I worked on. Then, I'd test the executables to see if they'd do what I needed them to do.

Who was someone you looked up to and respected during your internship?

Matt Davy. Matt is a very knowledgeable, very positive person who is right in the thick of next-generation networking technologies. Beyond that, Matt truly seems to enjoy what he does, and he was generous with his time. He really liked sharing his job with us interns.

What's the correlation between an internship in the fiber optic cable industry, and the field of computer science, and computer programming?

There is an undeniably strong connection. The project I worked on required me to learn a lot of programming that I'd never seen before.

Would you recommend this internship to other C.S. majors? Why? Why not?

Absolutely. If you can land one of these internships, DO IT. It's a chance to see the upper echelons of the high-tech industry in a relatively relaxed academic setting.

On a personal level, did you enjoy this internship?

Definitely. The people were interesting and fun to work with, well-rounded, and personable. The living situation was minimalist, but there were always people around to have fun with... and Bloomington is a great college town, with lots of good music, good food, and fun things to do.
What was the best personal experience you took away from your internship this summer?

Meeting the interns from other states and developing friendships over the summer.

What’s the most valuable thing you learned about the fiber optic cable industry?

I learned more about what it means for a network to switch to ipv6 from ipv4. We have some big changes coming in the near future for the internet because there are no longer any ipv4 address to go around.

What do you think is going to be the role of communication via fiber optic cable as we move forward into the twenty first century?

Unless we develop a radical new technology, fiber cables are going to be the primary networking medium for a long time.

How do you see this internship affecting your career as a computer scientist?

It was an excellent experience because I worked with Linux, Vim, Perl, and Apache, which was all new to me. I also met excellent professional network engineers, growing my personal network.

What did you learn about this industry during your internship in Indiana?

I learned the networking is at the core of computing as we know it today. We no longer use computers without the internet, so people with networking knowledge have a strong advantage when it comes to understanding the technologies that are being created today.

Describe the day-to-day activities of your internship.

Monday, Wednesday, and Friday, I went to work and wrote CGI scripts in perl all day for the SNAPP tools website frontend. Tuesday and Thursday they provided excellent educational lectures on basic networking and many other topics.

Who was someone you looked up to and respected during your internship? Camilo Viecco. Why?

He was an incredibly knowledgeable and busy person, but he still always took the time to explain new things to me and the other interns. People like Camilo make the globalNOC the excellent organization that it is.
What is the role of GCS? Where does it fit in the technological marketplace?

GSC Research uses Infosphere Streams and SPADE to create applications to process real time data for its clients. This company also developed a special sensor that is super sensitive to sounds. Founder Alex Philp’s other company TerraEchoes offers the services this sensor provides as a commercialized product. It’s used to monitor private companies for security purposes. The audio information this sensor gathers is processed by Infosphere Streams.

How do you see your role advancing within this company?

Alex Philp, the founder of GCS, seems very interested in RPS Wars. It could potentially be used as less a game and more as a war simulation. Similar programs could be designed to simulate populations perhaps. Evin, Alex, and I have also talked about adding elements of machine learning into RPS Wars.

On a personal level, have you been satisfied with your internship experience with GCS?

I’m satisfied with this internship. It’s like being paid to work on what I want to do, learn, and experiment without so much pressure. Researching cutting edge technology and perhaps being one of the first to create an application like this using it is also pretty exciting. I don’t know how often opportunities to research for pay happen, so I’m using every second of it.

Describe your knowledge of a technical aspect of GCS that you’ll be able to walk away from this internship with.

Even if I never use SPADE again after this internship ends, I’ve learned a new way to think about solving problems. Learning SPADE has been like learning Ocaml. It’s a completely different way to think about writing an application or solving a problem. Perhaps in the future I will run into other programming languages that are similar to SPADE as well.

Has your internship with GCS affected your career direction or aspirations?

This internship hasn’t really affected my career direction. What I’d like to do changes nearly daily, though it tends to stay in the video game, CGI, and film industries, anyway. This internship has shown me that staying in Montana is an option though. I’ve learned of projects going on at GSC and the Rocky Mountain Super Computing Center that are related to my job interests.

Describe the role of GCS in the marketplace for technology based mapping.

GCS seems to strive to be at the cutting edge of technology especially with its purchase of Infosphere Streams. Despite being a small company in a relatively small city, it’s seems to be a very competitive and successful company in the GIS marketplace.

Describe what you do on a daily basis with GCS.

Evin and I are creating a video game/simulation called RPS Wars, using a new programming language, SPADE. We first had to learn how to use the language, which we did over winter break last year. The user interface for this game is displayed using a Java application, so we also had to figure out how to get the Java and SPADE applications to communicate with each other. We spent most of last semester designing the SPADE and Java applications and researching how to get SPADE to do what we wanted it to. Artificial intelligence is a major part of the game. If the player didn’t interact at all, the game would essentially play itself. Designing the artificial intelligence in SPADE was and continues to be challenging and the most time consuming aspect. Last semester we were able to demonstrate some of the features of the game. This semester we are partially redesigning the Java and SPADE application to run smoother and implementing more of the game’s features.

What is the most valuable thing you have gotten out of your experience with GCS?

I’ve gained confidence from working with GCS. Before I was asked if I wanted to do this internship, I didn’t think I was skilled enough to do an internship or work.
Describe for me what you do on a daily basis with GCS.

Emily Palmieri and I were awarded a scholarship by GCS to research SPADE, a programming language developed by IBM. Through our research we were able to develop a SPADE component to Emily’s Java-based RPS Wars, an AI game based on Rock, Paper, Scissors.

What is the most valuable thing you have gotten out of your experience with GCS?

Alex Philp, the founder of GCS Research, is also helping us cultivate our careers. He continues to introduce us to important people who are interested in furthering both our research and personal goals. He is clearly invested in our success and we are grateful.

What is the role of GCS? Where does it fit in the technological marketplace?

GCS Research facilitates the task of processing geographic information in new and meaningful ways. Satellites and digital photography have made this data available on a scale not seen before, allowing innovative solutions to economic and environmental problems. In the 21st century, there is a high demand for these solutions and GCS stands ready to deliver them.

Describe the product of GCS?

GCS Research develops competitive Geospatial Information System (GIS) solutions for the private and public sector. Partnering with the Environmental Systems Research Institute (ESRI), GCS has been able to leverage the capabilities of pre-existing GIS software and data technologies.

How do you see your role advancing within this company?

GCS Research has expressed interest in employing Emily Palmieri and I but nothing formal has been arranged.

Describe the industry that GCS falls within. What do you think about the growth of this industry?

Digital computing has allowed the GIS industry to collect, process, and model geographic data more quickly and efficiently. The availability of this information has led to a high demand for GIS solutions and an explosive growth in the industry.

On a personal level, have you been satisfied with your internship experience with GCS?

GCS Research continues to foster our scholastic aspirations. I could not be more satisfied.

Describe your knowledge of a technical aspect of GCS that you’ll be able to walk away from this internship with.

My research has given me an in-depth knowledge of a programming language not publicly available to other computer scientists. Because of this, I have a special skillset that is in high demand in today’s interconnected world.

Has your internship with GCS affected your career direction or aspirations?

My research experience with GCS Research has given me new, attractive career options. As I continue my research, I look forward to them becoming even more attractive.

Describe the role of GCS in the marketplace for technology based mapping.

GCS Research is a small fish in a big pond of GIS development firms. However, they successfully out-bid large corporations for private and government GIS contracts. This is made possible through their use of innovative data technologies to process geospatial information in real-time. Because of this competitive edge, they will continue their rise as an important player in the GIS marketplace.
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