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Greetings from Bellingham. I hope this newsletter finds you well.

We are knee deep in another year of faculty hiring. This year we plan to hire four new tenure-track faculty, two of whom will specialize in CS Education. These faculty will teach in the CS department, do research related to CS Education, and will also work with future and current K-12 teachers through WWU’s Science, Math, and Technology Education (SMATE) program, helping those teachers incorporate CS in their classrooms. I was part of a state wide committee last year to create a K-12 CS endorsement and these new faculty will also be leaders in helping to create a pathway for teachers to obtain that endorsement. I’m excited that the state legislature and the public as a whole are so interested in creating more opportunities for Washington’s K-12 students to get exposed to CS. In our next newsletter we’ll introduce all the new faculty to you.

Further on the teaching side, a few faculty have been participating in a National Science Foundation funded teaching workshop at WWU over the past few years. This year those faculty held a weekly gathering with more recent faculty hires around student-centered teaching practices. The efforts of our current faculty in combination with the two new hires in CS Education promises to elevate our already high standards for undergraduate instruction.

The creation of all four of our new faculty positions came about as a result of a $1.6M grant I wrote to the Washington State Opportunity Expansion Fund. There is a whole article on this grant on page 5 which I encourage you to read.

On the research front, we had several students and one faculty member participate in research last summer at Pacific Northwest National Laboratories (PNNL). They all represented WWU well and opened up many doors for future collaborations with PNNL which I’m excited about. The department has obtained grants from the Air Force and private companies to support research efforts. In sum, dozens of undergraduate and masters students have participated in significant research projects over the past year and several students presented that work at national conferences.

Finally, I want to thank several alumni for donating money to support student scholarships, student conference travel, and other targeted activities. These are deeply appreciated. However, I would like to make a plea to our other alumni and friends of the department. As the department has grown, everything has been scaling up. We’re reaching new highs in the number of students we serve, the number of opportunities for professional development and career preparation we provide students, and the student involvement in department clubs (those clubs many of you tirelessly worked to keep afloat are now bustling with activity.) The only thing that has not scaled up is our fundraising for unrestricted department donations (i.e. those not targeted at a particular effort like a scholarship.) These unrestricted funds help us support student clubs and other key activities in the department. Please consider making either a one time donation to the department or a recurring donation of only a few bucks per paycheck. Either would make a huge difference in our ability to support our growing and incredibly active student body. If you do so, be sure to find out if your company matches donations so you can double the effect of your donation. Check out the back page of our newsletter for details about giving to the CS Department through the WWU Foundation. I deeply appreciate you reading this and considering helping the department. It is against my nature to make this broad call for donations but I decided to do it here because I see it impacting our growing student body, and as you know I can’t help but advocate for our students.

Take care,

[Signature]
The cybersecurity lab in our CS Department is currently working on a 3-year research project funded by the Department of the Air Force. The project is titled “Defensive OS-resident Cyber Deception Operations Rooted in MILDEC.” The project goals are to develop a novel capability for thwarting malware by incorporating diversity, misdirection, and confusion into an operating system, while preserving system usability and manageability. The central idea that underpins this work is to display on a computer system the existence of I/O devices such as disks, removable flash drives, webcams, and keyboards. While those I/O devices would not exist for real, their projection will make them appear as valid targets of interception and malicious modification, or as valid means of propagation to other target machines. The defensive capability operates on a machine in full production, and will be supported at the hardware level. Initial work on phantom network interface controllers and webcam controllers has shown that the approach is effective against a large sample of live real-world malware, with no interference in legitimate user work. This research has potential to detect and remove malware that has never been encountered before. The lab recently received an equipment grant from the Office of Naval Research to build a testbed in support of research on industrial control systems (ICS) security. The lab has acquired industrial computers, providing a research environment similar to those found in real-world electrical substations and power plants. The testbed is currently supporting research work on ICS malware analysis and forensics.
Erik Fretheim is the new Director of the Computer and Information Systems Security (CISS) Program. This program was first established as a joint program between Western Washington University and Whatcom Community College, and now has expanded to Peninsula College and Olympic College, with instruction provided at the Olympic College/WWU facility at Poulsbo.

Fretheim, who started at Western in September, will oversee the on-going development of the CISS program at both the Bellingham and Poulsbo campuses. The program offers a great opportunity for students to get into the high-demand field of cybersecurity.

Students complete the first two years of the program in community college, earning an Associate Degree in Applied Science, and then complete the final two years of the program at WWU, graduating with a Bachelor’s Degree in Computer and Information Systems Security (CISS) in a total of four years.

The partnership is a great example of what is possible with collaboration of WWU and community colleges statewide. Working together, students, businesses, and the community at large all benefit. Together WWU and community colleges offer a path for students to meet the workforce needed to protect our cyber systems and infrastructure.

Fretheim is excited about developing a broad range of multidisciplinary programs at WWU. For instance, developing medical and business applications to support privacy and security and offering courses open to students in these and other disciplines. Fretheim foresees developing a minor, possibly a certificate program, as well as a master’s program for graduate studies in cybersecurity.

One of the most exciting visions for the future is the creation of a lab in Poulsbo, as a resource to support cybersecurity research throughout the state via a number of different clouds. “The lab would support the release of viruses that would not be allowed to escape into the wild,” says Fretheim, “and systems for students to hack into that will not land students in jail, but are essential for students to practice.”

Fretheim has master’s and doctorate degrees in electrical engineering from the Air Force Institute of Technology. He also has an MBA in International Business from Long Island University and a bachelor’s degree in Computer Science and Electrical Engineering from the U.S. Military Academy.

He was previously the executive director and professor at the Technology Institute at City University in Seattle. In that position he created and revised undergraduate and graduate degrees in Information Security, Computer Science, Information Systems and Information Technology. He has also served as a CEO/CTO for industry and for the Army.
Congratulations to David Bover, named “Professor of the Year” by students, as the result of a survey administered by the student chapter of the ACM. Students praised him for being approachable in the classroom and beyond, and for creating an environment where students felt safe to ask questions they would have otherwise been hesitant to ask. His sense of humor was also dubbed “wicked,” as in “excellent.”

In June of 2016, the CS Department at WWU was awarded $1.62M from the Washington State Opportunity Scholarship’s (WSOS) Opportunity Expansion Fund.

Western’s Computer Science Department was one of three university initiatives across the state to receive funding from the Opportunity Expansion Fund, established by the legislature to help Washington universities fund programming that helps students earn high-demand bachelor’s degrees in science, engineering, computer science or STEM education.

The statute, which passed in 2011 along with the Washington State Opportunity Scholarship (WSOS) fund, allowed companies until 2015 to donate high-tech research and development tax credits to the expansion fund account. Microsoft, the only company to contribute to the expansion fund, donated a total of $6 million.

“At Western we put a lot of work into writing the proposal for this award and feel incredibly grateful that we were chosen,” Perry Fizzano said.

“"The award is allowing us to immediately hire four new tenure-track faculty in CS. Two of these faculty will be standard CS faculty while the other two will specialize in CS Education,”

“The education-focused faculty will not only help us deliver higher quality undergraduate CS education but will also work with future and current teachers and help them offer computer science in the K-12 system across the state.”

“Washington State Opportunity Scholarship is working to meet critical needs by investing in students, teachers, and innovative programs to educate and inspire thousands of current and future STEM scholars,” said WSOS Executive Director Naria Santa Lucia, “The Opportunity Expansion Fund grant awarded to Western furthers that mission by allowing Western to expand computer science degree capacity and develop K-12 computer science teachers.”

Everyone in the CS department would like to thank Microsoft for donating money to the fund, and to Naria Santa Lucia and the WSOS staff and board members for the great work they all do. Collectively they have made a huge impact on CS at Western. If you haven’t heard of the great work done by WSOS supporting STEM students across the state check out their website at www.waopportunityscholarship.org.

Professor James Hearne received the Carl H. Simpson Bridging Award at Opening Convocation 2016-2017. This well-deserved career achievement for Professor Hearne recognizes his efforts that extend well beyond the Computer Science Department.

The Carl H. Simpson Bridging Award recognizes and supports efforts to create bridges and forge new paths for others to follow and build upon. The award benefits a WWU student, staff or faculty member who has demonstrated an innovative approach to bridging an aspect of academic or campus life and bettering the Western community.

Professor Hearne assumed his position at Western in the Computer Science Department in 1986, moving directly from positions in the computer industry in which he had worked in radar and sonar. His efforts to bring the resources of computer science to problems in the humanities has recently found expression in the application of techniques from the machine learning tradition to the computer analysis and dating of ancient Sumerian writing. Jim Hearne received his BA, MA and PhD in Philosophy from UC Riverside.
2016 was a big year for the Game Design Club. Restructured as a registered club of the Associated Students, it is no longer an entity solely part of the CS Department. This change has encouraged students from all majors to come and check out what the club offers.

Each week the club meets to explore and discuss the various aspects of game design, and to admire or critique the many established games out on the market. Many students give individual presentations on the specific design elements which they have been involved in creating. This year they had presentations on voice acting, character development, level design, music, and much more, including guest speakers such as Ryan Miller from Lab Zero Games, who came to share his experience in animation for games like Skullgirls and Indivisible.

The most notable club activity is the quarterly Game Jam, a weekend long game-centric hack hosted by the students. Participants, whether enrolled here at WWU or visiting as a guest to the university, can gather in teams or work alone to design, implement, and show off a game of their own. It is at these events that the newly created interdisciplinary culture of the club rewards the members with an experience of different ideas and skillsets. Quite literally, every major here at Western has something unique to offer in the design process of a game, and when the club reflects only CS students it can be hard to find persons fully passionate and experienced in fields like music, writing, visual art, psychology, etc.

Each quarter aims for bigger and better Jams, with the spring event receiving enough recognition to garner the support from big names in the industry and community. On top of the monetary assistance from both the department and the AS, local company Faithlife and the game studio Bungie provided generous donations for the club.

Much has been achieved in what feels like a quickly lived academic year, but in the eyes of those who continue to run the WWU Game Design Club, this was just a proof of concept. The club will continue to expand in its members and involvement on campus. For 2016 the WWU Game Design Club was awarded the AS for Special Interest Club of the Year— which they hope to make an annual tradition.
PNNL’S NATIONAL SECURITY INTERNSHIP PROGRAM

Every summer, WWU Computer Science students swarm to internships at regional tech companies, but industry internships are not the only option available to students. Research-focused internships are available to students in both academic and government research labs. Three Western students chose the latter route in the summer of 2016, spending the summer at Pacific Northwest National Laboratory (PNNL), a Department of Energy (DOE) research lab located in Washington State.

All three were funded under PNNL’s National Security Internship Program. Graduate student Ellyn Ayton spent the summer working with researcher Svitlana Volkova at PNNL’s Richland campus, building systems using the language people employ on social media to detect and predict disease outbreaks. About her experience, Ayton commented, “I thought it was really valuable to experience how research is conducted in the real world. I had a lot of fun working in this area and collaborating with professional researchers.” Graduate student Aaron Tuor and undergraduate Sam Kaplan spent the summer at PNNL’s Seattle branch in South Lake Union developing novel deep learning models,

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PNNL’S NATIONAL SECURITY INTERNSHIP PROGRAM

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for streaming cybersecurity applications, working with a team of PNNL researchers and WWU CS faculty member Brian Hutchinson (who was visiting PNNL on a Visiting Faculty grant.) Having already interned in industry, Kaplan noted, “You have more creative control and a bigger voice when planning the direction of your work at PNNL.” Tuor was paid to immerse himself in research, gratefully reading research papers, coding, and collaborating with accomplished research scientists.

These internship experiences already paid off. Ayton authored a research paper on her work and traveled to Spain in December 2016 to present at the Neural Information Processing Systems conference. Tuor, Kaplan, and Hutchinson travelled to San Francisco in February 2017 to present two papers from the summer’s work; first at the Association for the Advancement of Artificial Intelligence conference, and the second at its affiliate workshop, AI for Cybersecurity.

The collaboration between PNNL and WWU will continue throughout the 2016-2017 academic year, thanks to a grant from PNNL to Dr. Hutchinson. The grant is funding Tuor and Kaplan for the remainder of their studies at Western, providing a full tuition waiver and a research assistant salary. Professor Hutchinson sees tremendous potential for future WWU-PNNL collaborations. “PNNL is full of interesting problems to work on, from energy, to health, to national security, and they have the funding to tackle these important problems,” Hutchinson said, “Western has a lot of bright, motivated students with an interest in applying their skills to real-world problems. It’s a great match and I’ll continue to look for opportunities for our students to benefit from collaborations with PNNL.”