

Department of Computer Science



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What's New...



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Spring 2016



From the Chair

For the past three years, I have greatly enjoyed our organization's partnership with Montana K-12 schools. This partnership, generously supported by the Gianforte Family Foundation, has helped raise awareness throughout Montana regarding the numerous professional and personal opportunities that computer science enables. During the 2016-2017 academic year, I am delighted to share the following new opportunities that are being underwritten by the Gianforte Family Foundation:

- *The Joy and Beauty of Data*, a successor course to the dual enrollment course entitled *The Joy and Beauty of Computing*, will be developed and piloted at Bozeman High School during Spring 2017. *The Joy and Beauty of Data* course will enable students to deepen their computational problem solving abilities with the Python programming language while gently being introduced to the increasingly important area of data science.
- During Summer 2017, we will provide one-week teacher training through Montana State University's Master of Science in Science Education (MSSE) program for both *The Joy and Beauty of Data* and *The Joy and Beauty of Computing*. Full tuition and stipends will be available to a limited number of Montana high school teachers who can offer either course as a dual enrollment course.
- We will collaborate with MSU's Department of Education to develop and propose a computer science teaching minor.

I hope you can benefit from these wonderful opportunities.

Happy Computing!

Around the Department...

- CS undergraduate students, MacKenzie O'Brien and Mike Trenk will present a paper, *The Effectiveness of Software Development Instruction Through the Software Factory Method for High School Students*, at the American Society for Engineering Education Conference in June.
- Clint Cooper was recognized as one of 40 outstanding seniors at the MSU Alumni Association/Bozeman Chamber of Commerce Awards for Excellence banquet in February. Clint selected Mike Wittie as his inspirational mentor.
- Three students from the CS Department have received summer Undergraduate Scholars Program (USP) awards. Ryan Darnell and Xuying Wang will work with Dr. Clem Izurieta and Maia Grudzien will work with Dr. Brittany Fasy. Congratulations!

2016 CS Awards

Congratulations to our faculty and graduate student award recipients!

- Outstanding Course Assistant**
Caleb Bryson
- Outstanding Teaching Assistant**
Fred Vollmer
- Outstanding M.S. Researcher**
Monica Thornton
- Outstanding Ph.D. Researcher**
Utkarsh Goel
- Outstanding Faculty Service**
Dr. Qing Yang
- Outstanding Faculty Researcher**
Dr. Mike Wittie
- Professor of the Year**
Dr. Qing Yang



Sit With Me
 MONTANA STATE UNIVERSITY College of ENGINEERING

Sometimes you have to sit to take a stand.

We sit in a Red Chair to symbolize women in computer science and technology.

We sit to recognize the value of women's technical contributions.

We sit to embrace women's important perspectives and increase their participation.

Watch the Video!

<http://www.cs.montana.edu/videos-undergrads.html>

MSU Robotics Team



MSU's NASA Robotics Mining Competition team will travel to Kennedy Space Center in Florida for the 6th annual competition, May 18-20, 2016. Watch the competition live at: <http://www.nasa.gov/offices/education/centers/kennedy/technology/nasarmc.html>

Demand Generation Initiatives Updates



Brandon Wood's kindergarten students at Frenchtown Elementary School learning binary!

Photo courtesy: Brandon Wood

Robotics Outreach

• Hunter Lloyd and Looney the Robot completed their final year touring Montana. Over 25,000 K-12 students watched Hunter, Looney and his robot friends. Looney and Hunter enjoyed meeting so many amazing students and teachers!

• **Looney Challenges!** The 2015-2016 Looney Challenges began September, 2015. Over 25 teachers have been participating during the 2015-2016 school year. Interested in joining in on the fun? It's not too late! Teachers can learn more and register to participate at www.cs.montana.edu/looney-challenge. Challenges can be completed at any time and in any order until June 30, 2016. It's easy! Register, do the activities with your students, and send us an email letting us know what the students learned. The top twenty point earners will win a Raspberry Pi! (www.raspberrypi.org).

Initiatives Renewed!

• The Demand Generation Initiatives will continue through the 2016-2017 school year with new opportunities for K-12 teachers and the Computer Science Department. Stay tuned for more information this summer!

Computational Thinking Course for Teachers

• CSCI 591, *Computer Science in the Classroom: Computational Thinking for Teachers* will be offered at Montana State University - Bozeman through the Master of Science in Science Education (MSSE) program. The two credit course is intended for 7th-12th grade teachers who want to learn how to incorporate computational thinking into the classroom. The course provides teachers the option to potentially teach *The Joy and Beauty of Computing* as a dual enrollment course at their school.

• The CS Department will also offer CSCI 592 for teachers who have already completed CSCI 591, *Teaching the Joy and Beauty of Computing*. The 1 credit course is available to teachers who have already completed the CSCI 591 course described above and will be offered during the same period. Contact Sharlyn for more information at Sharlyn.Izurieta@montana.edu.



Who's Who in the CS Department

Dr. John Sheppard, COE Distinguished Professor, has been a faculty member in the CS Department since 2008.



Born and raised in Pennsylvania, Dr. Sheppard graduated with a B.S. in computer science from Southern Methodist University and continued his academics working towards a Master of Divinity degree at Lutheran Theological Seminary. He received his M.S. and Ph.D. in computer science from Johns Hopkins University.

Dr. Sheppard's research focuses on artificial intelligence and machine learning. Current research projects include:

- Developing approaches to probabilistic hazard assessment and risk mitigation for deep space missions with the NASA Johnson Space Center.
- Precision agriculture project with MREDI to develop optimization methods for fertilizing, and controlling weeds in wheat fields with the goal of maximizing yield and protein in crops.
- Developing optimization algorithms for facility maintenance work plans for the US Army.
- Developing a standards-based framework prognostics for automatic test systems for the US Navy.

Dr. Sheppard welcomes undergraduate and graduate student involvement and is looking for students with strong software and analytic skills to help develop the systems and evaluate their performance.

When asked about the future of computer science, Dr. Sheppard is most excited about "the extent to which methods that have been identified with artificial intelligence (AI) and machine learning are appearing in real-world systems, such as face recognition systems, autonomous vehicles, and recommender systems in electronic commerce."

Dr. Sheppard feels blessed to be able to focus on and work with intelligent and talented students, both undergraduate and graduate, to help them explore new ideas and to be successful. His advice for incoming freshman? "Enjoy all that Bozeman and MSU have to offer" and the "CS program at MSU is a serious academic program that will prepare students well for a career in computing and you will need to put forth a good faith effort to succeed." Dr. Sheppard also advises students to get involved with research, "you might find that you will want to pursue a graduate degree when you finish your bachelors."

The Bozeman area has a lot to offer and Dr. Sheppard enjoys living in the mountains and living in a less populated area, but he also enjoys the "huge amount of musical talent" with music groups ranging from barbershop to opera, symphonic to indie rock."

MSU Competes in International Battlecode Competition

MSU Students, David Bell, Fred Kneeland, Joshua Leger and alumnus Bovard Tiberi ('09) competed at Battlecode 2016, an international artificial intelligence tournament, at the Massachusetts Institute of Technology (MIT). The team, *The Simple Soldier*, qualified as a finalist finishing in the 9th-12th overall category. Additionally, the team won awards for Most Creative Strategy and Most Adaptive Strategy.

The students researched and designed a navigation system based on "Jump Point Search," a well known algorithm for two-dimensional path finding optimization. The students designed a variant, "Bit String Jump Point Search," motivated by the concept of "searching lines or distances instead of points on a two-dimensional grid," according to the student's abstract, and "by the concept of searching lines or distances instead of points on a two-dimensional grid."

Three team members will graduate from MSU this Spring, but all members plan to continue to compete at the 2017 tournament. According to David Bell, the team enjoys working together to solve a fun problem and they are looking forward to a new challenge. Congratulations to the team for representing the CS Department and MSU!

To learn more about the Battlecode tournament, go to <https://www.battlecode.org/>.



Spring Break



Twelve students participated in the second annual Tech Road Trip organized by the CS Department in March. This year students traveled to the Seattle area to visit Microsoft, General UI, Tune, Google, Amazon, Security Innovation, and Facebook. Students also visited the EMP Museum, the Living Computer Museum and biked the Burke-Gilman trail.

The annual Tech Road Trip is open to all CS students and includes travel and accommodation costs. Previously, students have traveled to Boise, Idaho and the San Francisco area. For more information regarding the 2017 trip, please contact Dr. John Paxton.

**Thank You
Industry Affiliates!**

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