

# Engineering Education PhD Student to Represent USU at Women in Engineering Conference | College of Engineering

01/07/2020

LOGAN, UTAH — Jan. 7, 2020 — Utah State University PhD student Lori Caldwell was selected as a graduate student finalist for the Women in Engineering Local Collegiate Competition to be held in Salt Lake City, Feb. 7-8. Caldwell will be recognized as an outstanding graduate student contributor in engineering at the conference. Caldwell earned a bachelor's and a master's degree in biological engineering from USU and is now in the second year of her PhD program under the direction of Dr. Angela Minichiello, assistant professor in the Department of Engineering Education.



Caldwell, an active member of the USU section of the Society of Women Engineers, known as SWE, and the Society of Physics Students, demonstrates passion and exceptional talent for designing and implementing educational outreach and mentorship events for underserved populations in engineering and science. Along with serving as SWE president during her junior undergraduate year, Caldwell founded Engineering Extravaganza, an overnight engineering workshop that provides opportunities for young women from local high schools to explore engineering majors. The event, which hosts both student and parent tracks, drew over 230 attendees and raised over \$13,000 during its first two annual workshops. Based on these successes, Caldwell most recently founded PhysX, a similar workshop experience for young women interested in physics.

Caldwell's dissertation research is sponsored by the Office of Naval Research STEM Education and Workforce Program. Her research involves working with an interdisciplinary team comprised of engineering education, mechanical engineering and computer science researchers to develop, evaluate, and broadly disseminate an open-source, mobile flow visualization and measurement tool for STEM outreach and engineering education in the area of fluid mechanics.

Because undergraduate engineering fluids courses focus almost exclusively on mathematical problem solving, fluid mechanics can serve as a "gate-keeper" course that dissuades students from pursuing degrees in engineering disciplines related to fluids, such as naval, ocean and mechanical engineering. The tool, called mobile Instructional Particle Image Velocimetry or "ml-PIV," integrates state-of-the-art optical flow field imaging techniques used in research and industry with mobile hardware and LED laser pointers to provide learners capability to visualize and experiment with planar flow fields in real-time. Minichiello and Caldwell envision that ml-PIV can improve participation in fluid mechanics and associated engineering degrees by supporting early development of student interest and intuition about fluid flow concepts via hands-on activities in high school STEM outreach programs and in undergraduate engineering courses.

WE Local is a Society of Women Engineers program developed to bring the energy and networking of SWE annual conferences to members around the world on a regional scale.

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