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UW-Eau Claire, Hewlett Packard collaboration a powerful partnership

Students and faculty at the University of Wisconsin-Eau Claire can engage in more high-performance, data-driven research thanks to a new public-private collaboration with Hewlett Packard Enterprise that dramatically increases the university's supercomputing processing power.

The collaboration was announced Monday, April 26, at UW-Eau Claire.

Contributions totaling more than $700,000 from HPE, the National Science Foundation and UW-Eau Claire are enabling the university to purchase a high-performance computing cluster/supercomputing cluster and develop the Blugold Center for High-Performance Computing.

HPE contributed $363,426 in hardware and UW-Eau Claire contributed $20,000 to the project. A $350,000 National Science Foundation grant also supports the center.

"Thanks to Hewlett Packard Enterprise and the National Science Foundation, UW-Eau Claire is the first university in the United States to use HPE's Apollo servers with the Cray hardware called Slingshot," UW-Eau Claire Chancellor James Schmidt says. "This investment epitomizes the power of partnerships to drive innovation and provide mutual benefits. Not only do UW-Eau Claire's students gain the chance to conduct research in areas ranging from deep learning and artificial intelligence to data mining and computational number theories, HPE's leaders and technicians can now pioneer new technologies and receive expert feedback from our talented faculty and staff."

The additional 61 computer servers at an off-campus regional data center at Chippewa Valley Technical College can do some computations up to 100 times faster than what is possible with the existing Blugold Supercomputing Cluster that has 25 servers in UW-Eau Claire's Phillips Science Hall.

"As HPE considered where to locate our Global Center of Excellence for Performance Computer Manufacturing, the advantages of staying in Chippewa Falls became clearer and clearer as we engaged Chancellor Schmidt and UW-Eau Claire faculty and staff," says Adam Bauer, director of Issues and Policy Communications for Hewlett Packard Enterprise. "As a future-focused organization manufacturing supercomputers just up the road from this campus, the opportunity to partner with the university was a no-brainer. Together, we can advance research in Eau Claire to levels commensurate with any major university in the country. At the same time, students will have the opportunity to learn and work with us as undergraduates, laying a strong foundation for future employment."

The high-performance computing cluster at the regional data center form the Bose Cluster, named after Indian mathematician and physicist Satyendra Noth Bose. The powerful servers will provide UW-Eau Claire undergraduates

with even more high-impact learning opportunities as the university becomes a regional hub of high-performance computing, says Dr. Sudeep Bhattacharyay, associate professor of chemistry and biochemistry.

“One of the major goals of this university is to provide research opportunities to as many students as possible,” Bhattacharyay says. “This new computing facility can offer a large number of students this high-impact practice without any further investment. Our hope is that this increased computational power will also increase the innovative discovery of the undergraduate students on this campus.”

The original cluster on campus cannot handle the growing demand for computer processing power at UW-Eau Claire, say Bhattacharyay and Dr. Ying Ma, associate professor in materials science and bioengineering.

The increased capacity provided by the regional data center will meet UW-Eau Claire’s teaching and research needs for the foreseeable future, Ma says.

“HPE really is a big deal for us because the current cluster we have right now really limits what we can do in the cluster,” Ma says. “This new cluster opens many new doors.”

Ma and Chip Eckardt, senior information processing consultant at UW-Eau Claire, say computational science is becoming increasingly important in all branches of science.

“Computational science, which requires high performance computing, is going to be absolutely where everybody wants to be in the next three to five years,” Eckardt says.

Multiple academic departments — biology; chemistry and biochemistry; computer science; geology; mathematics; materials science and biomedical engineering; and physics and astronomy — now use the cluster, but many more departments will have access to it with the additional computing power of the Bose Cluster.

“In the departments of chemistry and biochemistry there are several research groups who are dependent on this high-performance computing, as well as materials science,” Bhattacharyay says. “There are a number of other university departments that depend on simulation, not just quantum mechanics-based computation practices, but other different molecular simulations. All faculty will have a very strong interest in this high-performance computing.”

The additional computer processing capacity is “really a game-changer” for UW-Eau Claire, says Dr. Rahul Gomes, an assistant professor of computer science.

“I look at this as a beginning of a new era where UW-Eau Claire emerges as the hub of deep learning and image processing in the entire Midwest,” Gomes says.

The Bose cluster creates yet another opportunity for UW-Eau Claire faculty and students to collaborate with its partner Mayo Clinic Health System’s physicians and others in the biomedical field.

“Medical science has become increasingly data driven,” Ma says. “You need a lot of data to make an informed decision, a diagnosis or treatment. This cluster will be the perfect tool to collect those data, analyze those data and then benefit medical science.”

Seeing UW-Eau Claire and Mayo Clinic Health System working together using the computer cluster may inspire other Chippewa Valley industries to consider how they also could benefit from the technology, Bhattacharyay says. Additional collaborations could help other businesses as well.

The supercomputing cluster gave Alyssa Huelsbeck, a senior from Little Chute, an opportunity to work on coronavirus research while still an undergraduate student.

“The world’s top scientists right now are working on coronavirus research and we’re undergraduate students getting first-hand experience with the supercomputing cluster,” Huelsbeck says. “It is an amazing experience.”