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Icy Hot Research

University of Dayton

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NEWS

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Icy Hot Research

The collaboration between the University of Dayton and The Helix Innovation Center is already paying off, resulting in the first patent application by Emerson for research performed at The Helix.

Two University of Dayton researchers are part of a team that developed an ice machine simulator, which is designed to help achieve the U.S. Department of Energy's target of reducing energy in ice machines by 10-15 percent by 2018.

Dave Myszka, co-director of the University of Dayton Design of Innovative Machines Laboratory, and Haithem Murgham, a doctoral student in the lab, created and assembled physics-based models of components within the ice machine.

The team tested its ice machine computer simulator within 5 percent accuracy of actual machines. Simulation results were compared with the experimental data of a fully instrumented, standard 500-pound capacity ice machine, operating under various room air and water inlet temperatures.

"Within the simulation, we can quickly change components and evaluate the resulting performance," Myszka said.

Emerson engineers said this was challenging considering the way ice machines work, continually cycling between ice formation and ice harvest modes. The model simulates this cycle plus calculates changes in the system because of machine capacity and environmental conditions.

According to Emerson, "cubers," as they are known in the industry, produce anywhere between 50 pounds to two tons of ice per day for restaurants, hotels, convenience stores and hospitals.

"This project was a great example of our ideation model at work. At The Helix, we explore new approaches to industry challenges, test concepts and then create new models to solve them. In this case, our process helped us create a system model that will support future innovations in ice machine efficiency," said Rajan Rajendran vice president, system innovation center and sustainability for Emerson's commercial & residential solutions business. "The collaboration with the University of Dayton was important to our success and we are pleased to have filed our first patent from our work at The Helix."

The University of Dayton performed \$117.6 million of sponsored research in fiscal year 2016, which ranks ninth nationally among private comprehensive research universities without medical schools.

Emerson opened The Helix Innovation Center on the University of Dayton campus in late 2015. At The Helix, University of Dayton students and faculty work with Emerson engineers and industry leaders to develop innovations in the heating, ventilation, air conditioning and refrigeration industry. The 40,000 square-foot center contains six simulated environments that provide University of Dayton students a real-world research playground they can't find anywhere else — a fully-functioning and furnished home, a model supermarket, a light commercial environment, a commercial kitchen, a data center and an industrial refrigeration system.

"The innovative culture at The Helix is apparent, and has motivated us with the understanding our work will ultimately lead to ice machines that use less energy," Myszka said.

For more information about Emerson's work on this project or interview requests for Emerson researchers, contact Holly Michael at holly.michael@fahlgren.com. For more information about the University of Dayton School of Engineering's work on this project or interview requests for University of Dayton researchers, contact Shawn Robinson, associate director of media relations, at srobinson@udayton.edu or 937-229-3391.