



Three students, three awards, three visions for their future

David Staudacher | Posted on May 14, 2021



Three UIC graduate students in mechanical and industrial engineering captured awards for outstanding research.

Unraveling rehabilitation robotics

PhD candidate Ernesto Hernandez-Hinojosa won the American Heart Association Predoctoral Fellowship, which provides more than \$63,000 to cover two years of study.

Hernandez-Hinojosa, who studies with Assistant Professor Pranav Bhounsule in the [Robotics and Motion Laboratory](https://pab47.github.io/), is part of a team developing control algorithms for rehabilitation robots with legs, including exoskeletons, prostheses, and service robots. The team is basing its control concepts on predictions of how human beings balance when they walk.

Hernandez-Hinojosa aims to remove the guesswork from these predictions by performing controlled experiments on humans when they are walking to extract the underlying control structure.

“My goal is to help bridge the gap between rehabilitation and robotics,” he said. “Although there are very intricate paradigms used to control robotics systems, there are very few systems that have learned from the human body.”

He noted that when rehabilitation robotics systems are informed by humans, the result is symbiosis: “the system first learns from the human, and then the human can use the system to learn how to walk again.”

When Hernandez-Hinojosa completes his academic career at UIC, he plans to continue conducting academic research as a post-doctoral researcher, as university professor, or at a clinic such as the Shirley Ryan AbilityLab. He also has his sights set on the possibility of working at NASA.

“I worked in the robotic division at the Johnson Space Center for eight months as an intern and really enjoyed the work I was doing,” he said. “With the new generation of spacecraft and upcoming missions to the moon and to Mars, robotics at NASA will continue to make great technological advancements. There might be an opportunity to use robotics to train astronauts in space or simulate microgravity on Earth.”