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Undergrad Researchers Put LEGO® Robots to the Test



Students Build Robotic Teams in Summer Research Experience



TAMPA, Fla. (Aug. 5, 2009) – Robots can build cars, vacuum rooms and even diffuse bombs, but they also like to have a little bit of fun - which is why a group of Lego robots and their student creators marked the conclusion of a summer research experience with a little friendly game of robot soccer.

The college's summer Research Experience for Undergraduates program culminated with a match between two teams of Mindstorms NXT robots Wednesday at the College of Engineering's Hall of Flags before a cheering crowd of students, faculty and children from USF's Creative Learning summer camp.

"The NSF robotics program is very significant in generating student interest in computer science and engineering," said Miguel Labrador, associate professor of computer science and engineering and the project mentor. "It gives the students real-world experience and is an excellent recruiting tool for computer science programs."

The summer research program serves 14 students from universities nationwide and is funded by the National Science Foundation.

Students spent part of the summer assembling the robot kits and then writing computer programs to make the mini machines behave like soccer players. The robots were programmed to recognize colors and behave accordingly – charging at a red soccer ball or aiming for a goal painted blue or purple. Two goalie robots were programmed to patrol the green felt soccer field and stop when they reached the edge.

The robots, though, are more high-tech than typical toys. They use sonar – much in the same way a bat does – to detect the ball's motion, moving left or right to counter the moving object. Small cameras help the robots detect the colors.



Kenneth Samuel Mendoza, left, and Abimilex Reverón, students in the College of Engineering's summer Research Experience for Undergraduates program, ready the LEGO robots for a game of soccer in a demonstration of how science can be used for fun.

Photo: Joseph Gamble

Blue Tooth Communications are used to exchange messages and implement group strategies and the robots have been programmed with soccer skills, such as kicking, blocking, passing and game strategies.

"We spent hours in the laboratory just using our imaginations," said Kenneth Samuel Mendoza, a Hillsborough Community College student who is pursuing an associate's of arts degree in computer science and engineering.



“What I learned most was the logic – being able to translate my thoughts and what I want the robot to do into a program and then seeing them execute it.”

At the end of the research program, the students will develop a week-long workshop for high school and community college students on how to create and program their own robots.

The REU program, now in its fifth year at the College of Engineering, allows undergraduate students the opportunity to work as research assistants with professors and graduate students on a variety of interdisciplinary research projects. The goal is to introduce students to the scientific process, research ethics and professionalism.

The University of South Florida is one of the nation's top 63 public research universities and one of 39 community-engaged, four-year public universities as designated by the Carnegie Foundation for the Advancement of Teaching. USF was awarded more than \$360 million in research contracts and grants in FY 2007/2008. The university offers 224 degree programs at the undergraduate, graduate, specialist and doctoral levels, including the doctor of medicine. The university has a \$1.8 billion annual budget, an annual economic impact of \$3.2 billion, and serves more than 46,000 students on institutions/campuses in Tampa, St. Petersburg, Sarasota-Manatee and Lakeland. USF is a member of the Big East Athletic Conference.

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