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Artificial Athletes Compete in RoboCup

By **ELLIOTT C. McLAUGHLIN**
 The Associated Press
 Tuesday, May 10, 2005; 9:09 AM

ATLANTA -- Robot dog soccer is one of five games that teams of scholars competed in during the 2005 RoboCup U.S. Open, held Monday at the Georgia Institute of Technology. The aim of the three-day competition, which ends Tuesday, is to develop software for better robots with the long-term goal of fielding a robot soccer team good enough to play a human team by 2050.

It looked like a scene from a sci-fi flick. Hugging the sideline, the robot dog waddled down the field and hit a ball with its nose. The ball bounced off the goal post.

It was one of the University of Texas' last chances to get back in the game, which it eventually lost 2-0 to the reigning European champs from Dortmund University in Germany.

"We want to play the best humans versus the best robots," said Alan Wagner, a doctorate student in computer science and artificial intelligence at Georgia Tech.

Four of the competition's events are soccer-based. The fifth is a search-and-rescue event in which teams remotely control robots to find victims in a collapsed building in a simulated disaster scenario. The robots whirred through the obstacle course as the sound of crying babies filled the room, and robotic appendages creepily waved back and forth amid the fake rubble.

The soccer games were diverse, with one involving Segway-riding humans playing with robotic Segway teammates in two-on-two competitions. Another featured nimble and boxy 5-inch-high robots forcibly firing a ball about the size of a golf ball across the field. Another was computer-simulated soccer.

By far, the most popular sport was robot dog soccer, which employs two teams of four computer-programmed Sony Aibos. There are no remote controls.

The dogs by default are programmed to act like pets, but when



During a game of AIBO (artificial intelligence robot) dog soccer the Georgia Tech goalkeeper spread eagles to attempt to block the shot of his a robot dog from the University of Texas during the Robocup U.S. Open Competition at Georgia Tech in Atlanta, Monday, May 9, 2005. The robot dogs were acting fully autonomously using artificial intelligence instead of remote control operation from a human. The competition was founded to foster and promote research in artificial intelligence and robotics. (AP Photo/John Amis) (John Amis - AP)

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programmers insert their own programs, the computer canines search for the ball with the cameras in their noses, chase it, silently communicate with each other over a wireless network and ultimately try to put the apple-sized ball into the goal. One dog is programmed to be goalkeeper.

In a way, the 3 1/2-pound, breadbox-sized robots are like real dogs. They're kind of cute. They come alive with a pat on the head, then bounce around and stretch. They even misbehave, unexpectedly running off the field at times _ much to their programmers' chagrin.

The game is a lot like real soccer, too. The 19-foot field has goal boxes and a center circle. There are penalties for pushing and obstruction _ and the Germans are feared.

Georgia Tech's Wagner said the German universities take the game more seriously than the Americans. Georgia Tech has six students working a few hours a week on the robot dog software, while trying to juggle classwork and research. Conversely, the Germans have about 20 students working 20 hours or more a week _ and they're sponsored by Microsoft.

"There's a world of difference between the teams that are not very good and the teams that are really, really good," Wagner said.

Matthias Hebbel, 30, a doctorate student at Dortmund, said he and teammate Walter Nistico first got involved as part of a yearlong project.

"It's so fantastic. We got stuck on it," said Hebbel, now in his fourth year with the team.

Neither would comment extensively on their undefeated team's chances of winning Tuesday's championship.

"About 50-50," Nistico said after the win over Texas, which ended with the four German dogs gesturing as if they were flexing their biceps _ which they were preprogrammed to do, of course.

While the competition offers a welcome respite for the students, RoboCup U.S. Open Chairman Tucker Balch said the competition has real-world applications.

While technology for batteries, motors and computer processors has rapidly advanced over the last decade _ thanks mostly to the rising popularity of laptops and cell phones _ the software to efficiently control all those components has yet to be mastered, said Balch, who also is an assistant professor of computing at Georgia Tech.

"RoboCup is primarily organized to drive software that will make really aware robots possible," Balch said. "Soccer provides a really nice testing environment. Everyone understands soccer so we don't have to explain what they're trying to do."

On the Net:

RoboCup: <http://www.robocup.org>

RoboCup U.S. Open: <http://www.robocup-us.org>

Robot Dog Soccer League:
<http://www.tzi.de/4legged/bin/view/Website/WebHome>

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