DFW researchers use 'toy' robot to gain insight into autistic children...

Anthony Arceri stood in front of Zeno, a friendly, child-size robot that was ready to play.

"What is your favorite food?" Zeno asked Anthony, a 7-year-old decked out in a black outfit covered with sensors.

"Chocolate milk and french fries," Anthony responded.

"I love chocolate milk," Zeno said.

When Zeno raised his arm, so did Anthony. When Zeno rubbed his stomach, so did Anthony.

While the interaction between Anthony and the robot -- which stands about 2 feet tall, can move its arms and has lifelike facial expressions -- may seem like just high-tech fun, researchers hope it holds the key to early diagnosis and treatment of autism.

Researchers from the University of Texas at Arlington, the University
of North Texas Health Science Center at Fort Worth, the Dallas Autism Treatment Center, Texas Instruments and Hanson Robotics are collaborating on a one-year project that is funded in part by a $100,000 grant from the Texas Medical Research Collaborative.

Nicoleta Bugnariu, associate professor at the health science center and a physical therapist/neuroscientist, said it is important to diagnose autism during motor skill development, which precedes language development.

Autism spectrum disorders are not often diagnosed until a child is speaking.

"If we can look at a marker prior to language development, then we can diagnose children earlier and intervene earlier," Bugnariu said.

Pamela Rainville, Anthony's mother, said she hopes the research will give doctors and other professionals additional information that will not only help teach her son how to interact but also provide him and others with life skills.

"We just hope that by doing this research, that it will help someone else," Rainville said.

Not threatening

Dan Popa, an associate professor of electrical engineering at UTA and the lead investigator, has been involved in robotic research for 20 years.

He said the trend is for robots to be used outside the lab.

Robots help people who have difficulty moving and teach children how to interact.

Since Zeno is a social robot, responding to verbal commands and gestures, autistic children see it as a toy and won't be threatened, he said.

"Autistic children are very drawn to this robot. It's easier for them to respond to this robot as opposed to an adult."

Carolyn Garver, who is director of the Dallas Autism Treatment Center and is recruiting participants for the study, said the data collected from the robot and virtual-reality games will give doctors and others involved information that is sometimes difficult for humans to discern, such as ways of moving the body or eyes.

She said there are no biological methods for determining autism.

Four children have signed up, but researchers hope to have 10.

'Likes trying new things'

As the testing continued, Anthony hopped onto a treadmill with a 180-degree curved screen. Researchers used several scenarios, such as a shooting gallery, that measured Anthony's movements as he shot at rubber ducks.

Another scenario showed a path going through woods leading to a house. Anthony had to shoo away birds by moving his arms as he walked on the treadmill.

Rainville said that autism differs from one child to the next and that working with Zeno is not the answer for everyone.

But she has visited the health science center twice and will come back in about four months. She said
her son likes the interaction with technology and wants to have a treadmill with a TV at home.

"I wouldn't do this [participate in the project] if he didn't enjoy it. He likes trying new things," Rainville said. "I want to make sure that Anthony succeeds in life when I can't be there to help him."

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