Purdue pioneering robot tech

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Jeffery Siskind, a professor in Purdue University's School of Electrical and Computer Engineering, has worked for decades to ground natural language in computer and robotics systems.

In laymen's terms?

Siskind's work focuses on facilitating language acquisition in computers and robots.

With funding from the National Science Foundation, the professor and a team of researchers — Daniel Barrett, Scott Bronikowski and Haonan Yu — developed the process and technology to teach a robotic car how to drive and navigate based on verbally issued instructions.

"You drive through a lot of paths, giving each path a description. In our case that's about 600 paths," Siskind said.

While running these various courses, often littered with a half dozen obstacles, the car begins to make associations between language, the path, obstacles and how to react.

"It correlates the nouns and the prepositions with aspects of the path, waypoints and the sensor data," Siskind said.

In its present iteration, the car performs with roughly 89 percent of the accuracy of a human, a statistic Siskind hopes to improve.

Beyond the initial cool factor, this technology could have serious implications for several industries, including automobile manufacturers.

A self-driving car is on the not so distant horizon and this technology could be integral when providing directions and navigating autonomous vehicles.

Bronikowski, now working at General Motors in Michigan, said he also sees applications that might save lives. Bronikowski, who served in the

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Jeffrey Siskind, professor in Purdue's School of Electrical and Computer Engineering, sits next to the robotic car.

army for 17 years, said a robot that responds to voice commands would be useful in combat.

"In order to use a robot in a hostile situation you have a soldier who has to take his or her hands off a weapon and put them on a computer screen. This means they are completely defenseless," Bronikowski said.

Siskind and Bronikowski see further applications in the area of disaster relief. Both referenced the usefulness of such a device in situations like the Fukushima nuclear plant disaster. Much further down the road Bronikowski said he even sees potential for devices that assist the elderly or handicapped.

Testing and development for the technology will soon enter another phase.

Siskind said he wants to take the vehicle out of the classroom and onto campus. Then, instead of navigating an obstacle course, it will be forced to make its way to specific destinations, problem solving along the way.

"We're trying to make the robot understand its own capabilities, its limitations and teach it to interact with humans," Siskind said.

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