

In the next war, maybe, no drivers will be needed

In the fight against roadside bombs, two Twin Cities companies helped create a car that drives itself

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The driverless Lotus snapped off a crisp left turn and accelerated down the parking lot.

The car was driving itself. If a reporter stepped in its path, would it stop? Or plow through to its destination?

The reporter braced; the car grumbled closer. At the last moment, it shuddered and braked.

Exhale. Hello, robo-car.

Goodbye, roadside bomb casualties?

Roadside bombs and improvised explosive devices have become one of the greatest threats to U.S. troops traveling the roads in Iraq, causing more than 40 percent of U.S. military fatalities. The U.S. military wants to reduce that risk by using robotic vehicles to ferry supplies by themselves without humans at the steering wheel.

Control Corp., a Maple Grove company that makes computer-routing equipment, teamed up with the Bloomington-based subsidiary of a German company, Sick AG, that makes laser measurement sensors, to bring the robotic car of the future closer to reality.

They are participating in a contest sponsored by DARPA - the Defense Advanced Research Projects Agency, which created the forerunner of the Internet in the 1960s - to develop a robot vehicle that can handle complex situations, like those dealing with traffic and the hazards of war.

"The core application is to take a Jessica Lynch out of the Jessica Lynch story," said Jeff Wuendry, a product manager at Sick, referring to the soldier who was captured and rescued in Iraq after her truck convoy was ambushed. "Essentially, it would be having those convoys running by themselves."

It's science fiction getting tailgated by science fact. Although robo-cars won't be on your street for another 20 years, maybe, company officials say, military officials have a tighter deadline: They want their own robot vehicle on the road within eight years.

"Hopefully by 2015, a good percentage of the Humvees and convoy vehicles will be autonomous," said Bradford Beale, Control's vice president.

The rules of the DARPA contests are simple: The car must drive itself. No remote control. No human assistance. No pre-selected routes. You program in the starting point and the finishing point and the car must figure out where to go and get around obstacles.

In the first DARPA Challenge race in the California desert in 2004, no vehicle came close to completing the 130-mile course.

In the second off-road race in 2005, the winner was a geeked-up Volkswagen Touareg from Stanford University.

This year's race will be different. The cars must navigate streets and traffic signs outside Victorville, Calif. in November. SUVs that bulldozed their way over gullies and cactus will get penalized if they hit other cars or run red lights.

"The vehicles must perform as well as someone with a California driver's license," said Tony Tether, director of DARPA.

The winner gets \$2 million, but that's probably less than most of the entrants have spent to develop their vehicles.

Comtrol and Sick have been involved in the contest before, but this year they are teaming up - along with several other companies - to co-sponsor North Carolina State University's entry, the Insight Racing Lotus Elise.

Comtrol has provided the networking routers - think of them as the car's nervous system, translating and funneling different input from a camera, laser sensors, radar, GPS, altitude sensor and wireless Internet into nine computer processors crammed into the trunk of the sports car. It supplies the networking routers for about half the 36 cars going into the October semi-finals.

Laser sensors from Sick bristle on the bumpers of almost 90 percent of the cars, acting like fingers that can reach out and measure how far the car is from objects in front of it.

Not all military robots are so complicated. Engineers at the University of Minnesota's Center for Distributed Robotics have developed a 'bot the size of a large soup can that carries a camera and can be tossed or shot out of a grenade launcher. Developed for DARPA, the Scout already is being used in Iraq and by police forces around the world to gather information in areas too dangerous for humans.

Nikos Papanikolopoulos, director of the center, has resisted pressure to enter the DARPA robot car challenge. The robots are trying to do too much, he said.

His answer? Single-purpose robots like his Scout. "If we can build robots ... that look at the problems the Army faces, such as finding IEDs, manipulating and detonating them, we can save lives with fewer resources," he said.

But Comtrol's Beale said the equipment that Comtrol and Sick are providing can be used off-the shelf with little modification. The big expense is in programming the artificial intelligence into the computer brains, he said.

"You can try to take an incremental approach or a leap forward. I think that's what DARPA is trying to do - take a big leap forward," Wuendry said.

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