Race Car To Climb Mountain — Without A Driver

Terence Chea, Associated Press Writer

SAN JOSE, California (AP) — It can traverse rough terrain, accelerate quickly and negotiate sharp turns like other high-performance sports cars, but there's one thing that sets this Audi coupe apart: It doesn't need a driver.

The car, named Shelley, is the latest creation by Stanford University researchers who are developing technology that could help make driving safer and one day allow ordinary vehicles to drive on their own.

The self-driving car will face its biggest test this fall at Colorado's Pikes Peak, home of the world-famous International Hill Climb that has bedeviled professional drivers with its steep grades and treacherous switchbacks since 1916.

Automotive researchers have already designed experimental vehicles that can drive long distances or navigate city streets without a driver. With Shelley — named after Michelle Mouton, the first woman to win the Pikes Peak race — the Stanford team is developing a car that can drive at high speeds under extreme conditions.

"What we're trying to do is create an autonomous race car, an autonomous rally car, so a car that can drive itself up to the very limits of handling," said Christian Gerdes, a Stanford engineering professor who directs the university's Center for Automotive Research.

It may be years before someone can send the minivan out to pick up the kids from soccer practice, but autonomous car technology has already led to features such as automatic parallel parking and adaptive cruise control, which lets a car handle stop-and-go traffic on its own.

The U.S. Department of Defense has been developing driverless technology that allows unmanned vehicles to perform military missions without endangering soldiers. Its research arm, the Defense Advanced Research Project Agency, has been sponsoring autonomous vehicle contests since 2004 with the goal of making one-third of the military's ground combat vehicles driverless by 2015.

Volkswagen AG, which makes Audi vehicles and is working with Stanford on the Shelley project, has set a goal of creating fully autonomous vehicles by 2028, said Marcial Hernandez, a senior engineer at Volkswagen's electronics research lab in Palo Alto.

"You're tired at the end of the day. You just want to relax on your way home. Push the button, and the car gets you home," Hernandez said. "It's really about the car knowing how to drive."

Shelley is an Audi TTS that has been equipped with GPS receivers and can be programmed to follow any route using a digital map. The research team has developed computer algorithms that let the car make real-time adjustments to the terrain and calculate how fast it can go without spinning out of control.

That technology could one day be used to create smarter cars that help motorists avoid accidents when they're driving fast, said Stanford's Gerdes.

"We hope this will be inspiration for future safety systems, for cars that will help a drivers drive up to the capabilities of the car," Gerdes said. "So if you're suddenly on a slippery road, the car should be able to react and keep you safely in the lane, pointed in the direction you want to go."

At Pikes Peak, Shelley will climb 4,721 feet (1,439 meters) up the 14,110-foot (4,300-meter) mountain on paved and gravel roads as it covers the 12.4-mile (20-kilometer) race course and its 156 turns at high speeds. The feat has never attempted by an autonomous vehicle.

Nearly 200 cars, trucks and motorcycles are expected to take part in the 88th annual "Race to the Clouds" on June 27, but Shelley will have the road to itself when it attempts the course in September. Once the team hits the start button, Shelley will be making all the driving decisions on its own.

"This really represents the ultimate challenge," Gerdes said.

Shelley is the latest autonomous car designed by Stanford's automotive research center, which is working with major automakers and Silicon Valley tech firms to develop car technology.

In 2005, Stanley, a driverless Volkswagen Touareg SUV, won the $2 million top prize in the Defense Advanced Research Projects Agency's Grand Challenge, a 132-mile autonomous car race through the Mojave Desert.

Two years later, Stanford's Junior, an autonomous Volkswagen Passat Wagon, won $1 million when it placed second in DARPA's Urban Challenge, a city driving contest that requires cars to follow traffic laws and avoid other vehicles.

Shelley has already reached speeds of 130 mph (209 kph) at the Bonneville Salt Flats in Utah. In May, Gerdes' team plans to take Shelley to El Mirage Dry Lake in Southern California and attempt to break the world record for fastest autonomous land vehicle.

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