Human roadblock for Japanese firms developing autonomous cars

November 15 2015, by Anne Beade

The Toyota logo on a Sienta car displayed at its headquarters in Tokyo

Japanese car manufacturers will have to convince the public that letting go of the wheel in a self-driving car is safe, while also dealing with the biggest threat to the cars' security: the humans using them.

Toyota, Nissan and Honda are intent on putting autonomous cars on highways—and also city roads for Nissan—by 2020, and the triumvirate of Japan's auto industry were keen to stress the advances made so far at

the recent Tokyo Motor Show.

Their stated goal—preventing deaths on the road—is laudable, but the technological arms race is also highly lucrative: consultancy firm AT Kearney has estimated the market for the self-driving car could be worth more than $566 billion by 2035.

Nissan chief executive Carlos Ghosn told reporters at the Tokyo show the company has high hopes the technology will save lives while altering car journeys forever.

"It compensates for human error, which causes more than 90 percent of all car accidents.

"As a result, time spent behind the wheel is safer, more efficient and more fun," he said.

But Ghosn's comments belie the work still to be done, as its engineers edge forward in steps rather than leaps.

Google offers promises of a fully autonomous car, but these automakers are taking a more gradual approach, focusing on aspects such as self-parking and crash avoidance technology.

Functions such as emergency braking and speed-limiting devices that track the distance between vehicles already exist, but getting drivers to abandon the steering wheel completely is a harder sell.

"We must make sure our clients understand how the machine works," said Nissan's chief planning officer, Philippe Klein.

To instil confidence, the artificial intelligence that will power Nissan's autonomous cars will mirror the driver's driving style as closely as

possible, while "ironing out any bad habits", the automaker said.

A driver tries out a Lexus GS450h on the Tokyo metropolitan highway during Toyota's advanced technology presentation

Intersection conundrum

Obtaining the trust of drivers is crucial, as without it "we cannot move forward", said Moritaka Yoshida, a Toyota executive.

And even if the user of a self-driving car is convinced of its superior safety, other road users need to feel secure sharing the tarmac.

Manufacturers are experimenting with icons or written messages appearing on wind-shields, warning sounds, and in one case a light-strip

along the length of the car whose colour and intensity would alter in different situations.

Intersections present a particular challenge, said Melissa Cefkin, who is based at Nissan's Silicon Valley research centre.

"Sometimes drivers communicate between themselves and with pedestrians or cyclists directly, by swapping looks, with a hand gesture, or even verbally," she said.

"Sometimes it's interpretative: we look for signals while judging the vehicle's speed and movements."

The tiny pointers that motorists pick up from one another are not yet within the reach of the technology.

"Currently, the machine isn't capable of grasping all the subtlety of these clues," Cefkin said.

To better understand them, Nissan is undertaking the immense task of studying thousands of intersection scenarios in an attempt to identify cultural patterns by country or context.

U.S. Transportation Secretary Anthony Foxx (R) and Google Chairman Eric Schmidt (L) get out of a Google self-driving car at the Google headquarters on February 2, 2015

Regulatory roadmap

Besides, once everyone on the road feels comfortable with autonomous cars in their midst, auto firms must still convince regulators of their safety before they can hit the streets.

"Today, you have to drive with your eyes on the road and your hands on the wheel. If the regulation doesn't change, having a self-driving car will be totally useless," said Nissan's Ghosn.

"Everything depends on public-private cooperation," he added.

Car companies are already conducting intense exchanges with such authorities across the globe, said Toyota's Yoshida, adding he hoped that Europe, Japan and the United States would succeed in shaping "global norms" for the industry.

This month, Toyota unveiled a vehicle that can drive itself along a highway, but CEO Akio Toyoda is acutely aware of the legal minefield his firm must navigate before putting it on commercial sale.

"Imagine if a major accident occurred that implicated a self-driving car. We have to go step by step," Toyoda said.

And while humans may be the architects of their own downfall on the roads, self-driving technology cannot yet match our level of sensory perception, emphasised Honda's chairman Fumihiko Ike, urging caution over the limits of the technology in the short term.

"Human intelligence has no equal for working out what is happening on the road, so I think fundamentally it won't be easy to leave it to the machine except in very restricted conditions such as motorways or specific routes," Ike said.

© 2015 AFP

Citation: Human roadblock for Japanese firms developing autonomous cars (2015, November 15) retrieved 9 April 2024 from
https://phys.org/news/2015-11-human-roadblock-japanese-firms-autonomous.html