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Sensor cuts self-driving car costs

Roof turrets not needed

Gabe Nelson

From left, Velodyne's 64-, 32- and 16-beam sensors. The 16-beam costs just $7,999.

SAN FRANCISCO -- You can't buy one yet, but the autonomous vehicle just got a little cheaper.

As long as Google Inc. has been testing its experimental self-driving car, the costliest bit of hardware has been its rotating roof-mounted turret, which uses a laser-based radar system called lidar to map the car's surroundings in three dimensions.

These spinning sensors, supplied by Morgan Hill, Calif., technology firm Velodyne Inc., cost $30,000 to $85,000 -- cheap enough for automakers and suppliers to buy them for research but far too expensive for a production vehicle.

This month, Velodyne introduced a smaller, puck-shaped sensor at a price of $7,999, demonstrating that the supply chain for autonomous vehicles is rapidly maturing and chipping away at the cost of putting the technology into a production car.

"If you think about putting an $80,000 sensor on a $30,000 car, it just doesn't make sense," Wolfgang Juchmann, director of sales and marketing at Velodyne, said in an interview. "This product potentially addresses that issue."

The new sensor, nicknamed the Lidar Puck because it is the size of a hockey puck, offers a lower-resolution image from its 16 laser beams than more expensive models do.

Google prefers Velodyne's top-of-the-line model, which has 64 laser beams and costs $75,000 to $85,000. Velodyne also sells a 32-beam system for $30,000 to $40,000.

Juchmann said the smaller sensor has advantages besides its lower price. It is small enough to be integrated into the side mirrors or A-pillars of a car, he said, eliminating the need for a roof-mounted cage that would sully the looks of a sedan or crossover.

That is a priority for automakers; Toyota this month unveiled a system it developed in-house that can be installed on the body of the vehicle instead of on a roof mount.

Sensing a market opportunity, Velodyne, a 31-year-old company best known for selling high-end subwoofers to audiophiles, is shifting resources toward lidar. After a recent manufacturing expansion, Juchmann said, factory floorspace once committed to audio equipment now is being used to make sensors for autonomous vehicles.

Traditional automotive suppliers are developing lidar sensors as well. Continental now offers a lidar sensor intended to look in just one direction, rather than offering 360 degrees of vision; Bosch intends to offer something similar by 2020.

Juchmann said Velodyne is open to partnering with established suppliers to sell its sensors and to striking a deal with automakers for exclusive use in vehicles. The company already has a contract giving Caterpillar Inc. exclusive license to use its lidar sensors for autonomous mining equipment.

"If they would say to us 'We want to buy the rights,'" Juchmann said in reference to automakers, "we might not say no to that."

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