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High Sensor Costs Won't Stand in the Way of the Self-Driving Future

Timothy B. Lee January 11, 2013

Owen Thomas at Business Insider says that “a true self-driving car is far from hitting the market.” Why? Because according to a source, “the massive array of sensors Google has to install in its cars alone costs \$250,000 or more.”

I think this analysis is mistaken in two ways. First, the cost of hardware in a prototype like this is not a good predictor of the costs of the eventual finished product. When Google was outfitting its 12 self-driving cars, it likely used off-the-shelf sensors designed for industrial, military, or laboratory use. These high-end customers have plenty of money and care more about performance and features than low cost.

Because the number of potential customers for such experimental sensors is small, the firms manufacturing them have to charge a high price per unit just to cover the fixed costs of designing the product, setting up the factory, and so forth. But the economics will change dramatically if Google or a car company decides to begin mass-producing self-driving cars. They'll design (or pay a vendor to design) sensors that have only the features needed for self-driving cars. More importantly, they'll be able to spread the fixed cost of the development process over millions of units rather than thousands. They'll drive a hard bargain, and the sensor manufacturer will be happy to accept a slim profit margin in the expectation of selling millions of units.

Put these factors together, and it's easy to imagine the first mass-produced sensors being cheaper than the ones Google is using now by a factor of 2, 3, or even 10. And as with every other type of digital hardware, the price will only fall from there as manufacturers continue to scale up and to refine their production processes.

Second, Thomas seems to be assuming that most people will buy self-driving cars outright. Maybe a few wealthy people will do that, but I predict most consumers will find it cheaper to rent self-driving cars as taxis. Right now, most people buy a car and leave it sitting in a parking lot or driveway 80 to 90 percent of the time. So each passenger has to cover the full cost of a vehicle all by him or herself. In contrast, a self-driving taxi

effectively operates a time-sharing scheme. The cost of the expensive hardware is spread across all the customers who use the vehicle.

Obviously, most people can't afford the monthly payments to buy a \$300,000 self-driving car outright. But lots of people could afford to buy 10 or 20 percent of a \$300,000 vehicle's time. And most people don't use their cars more than 10 or 20 percent of the time. So many modestly affluent consumers will find it practical to sell the BMW and just take a self-driving taxi everywhere they go.