Android Powered Cars

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Last month I wrote about robots, and one of the trends I pointed out was the advances that the automotive industry is making towards autonomous vehicles - cars that drive themselves. Well, this month, at the massive Consumer Electronics Show (CES) in Las Vegas, this future came closer to reality.

One of the major stories was Google's creation of the Open Automotive Alliance - which is focused on integrating Android into cars. Founding members of the alliance include General Motors, Honda, Hyundai, and Audi, so this has major industry support and isn't just Google's wishful thinking. General Motors, Audi, Toyota, and others had major announcements of their own. This is cool technology - but as the tech experts at our churches, how should we be thinking about these "advances?"

What are autonomous vehicles, and do they really exist?

An autonomous vehicle is one that drives itself without any assistance from humans. Think of it as true "auto-pilot" - you tell the car where you want it to go, and it takes you there. Research efforts have existed for decades, but picked up pace when the U.S. Congress authorized the Defense Advanced Research Projects Agency to offer prize money to advance the development of autonomous vehicles.

The first DARPA Grand Challenge was held in 2004, but the best entrant only completed 7 miles of the 150 mile desert course. The next year, 5 cars finished the course with the winner finishing in just under 7 hours, 10 minutes ahead of the second place finisher. In 2007, the winning car completed a 60 mile urban course in just over 4 hours.

Google hired Sebastian Thrun, the Stanford professor who led the 2005 Grand Challenge winning team and the team that finished second in 2007. Thrun's first project, while on a sabbatical from Stanford, was development of Google Street View. Thrun's next project for Google was the Google driverless car. This project adds Google Chauffeur software and $150,000 worth of equipment to a standard vehicle to create a car that really does drive itself. In August 2012, the team announced that Google Chauffeur had driven over 300,000 accident free miles and that there are typically 12 Google driverless cars on the road at any given time.

In 2012, Nevada, Florida, and California all passed laws allowing driverless cars to legally operate in their states.

Key technology elements required for autonomous vehicles have slowly been making their way into commercially available cars. My most recent car purchase is a vehicle with a number of cameras and sensors to enable aspects of self driving including braking assistance, lane drift alerts, and adaptive cruise control. Of these, adaptive cruise control (ACC) provides a good example of how our cars are starting to drive themselves. With ACC, I set the speed I want to drive and how much space I want to the car in front of me. The car then controls the engine and brakes to maintain that safe distance while trying to drive my desired speed. If the car in front of me is going too slow, my car slows down to maintain safe following distance. When that car is no longer slowing me down, my car accelerates again to my desired speed. ACC will even bring my car to a complete stop if the car in front of me stops, and brings my car back up to the desired speed when traffic starts moving again.

One informative aspect of ACC is that the maximum following distance I can set is 2.5 seconds. In driver's ed, my son was recently taught that 3 seconds is the safe distance you should maintain. Why doesn't

ACC maintain at least 3 seconds spacing? Simply stated, the electronics in my car will detect and respond faster than I could. Do I feel safe driving with ACC? Yes. Do passengers in my car feel safe? Not always.

There are two areas that require my constant attention while driving. The most common is when I'm approach a stoplight intersection at a high speed (for example, on a major road with a 45 MPH speed limit). If cars are stopped at the light, I don't trust that there will be enough time between when those cars are close enough for the sensors to detect and when I need to stop, so in these cases, I manually apply the brakes and begin slowing the car well in advance of the intersection. The second area that I need to constantly pay attention to is cars moving in front of me from the side - either cutting in front of me, or entering from a side street. ACC likely would respond to these situations, but probably not in a way that would be comfortable for me and my passengers.

At CES, Audi and BMW both demonstrated advances in driverless car technology. Audi has reduced the computer systems required to operate their driverless demonstration vehicles from trunk to glovebox size. Audi refers to the near-future as "piloted driving" where the car does much of the second to second decision making, but a driver is still behind the wheel. Already, cars on the market can help you stay in your lane as you drive down the road, and will respond to other cars around them, but in the near future, cars will recognize stop signs and traffic lights, and will determine when to change lanes. Experts

predict that we're still 7 to 10 years away from a commercially available self-driving car, but those days are coming fast.

How can autonomous vehicles help in ministry?

One of the videos Google has made to promote their driverless car initiative shows Steve Mahan, a legally blind man, driving around town - going through the fast food drive through, and parking at the dry cleaners. A friend of ours is a legally blind music ethnologist for a major Bible translation ministry. In our auto-centric society, he is limited in where he can go and when by the availability of someone to drive him. Autonomous vehicles could help him and many others to be more active in church ministries and in applying their gifts to advancing the kingdom.

What is dangerous about autonomous vehicles?

Obviously, it's scary to think of self-controlled machines hurtling down our highways at 70 miles per hour. Especially for those of us who have personal experience with software bugs, it's easy to imagine worst-case scenarios. As we've seen with problems that have already crept into the electronics already in our cars - perhaps most famously Toyota's problems with out of control acceleration - machines are programmed by fallen man who can't create perfect software.

However, I think the greatest danger is our over-reliance on man-made technology instead of trusting in God. As Proverbs 3:5-6 tells us "Trust in the LORD with all your heart, And lean not on your own understanding; In all your ways acknowledge Him, And He shall direct your paths."

It is my hope and prayer that these articles on the power and danger of technology will encourage you in your daily walk with Christ. Whether it is the printing press, radio, television, personal computers, the Internet, the Cloud, smartphones, or even autonomous vehicles, new technologies continue to advance our ability to know God and to serve Him, wherever we go.

Russ McGuire is an executive for a Fortune 100 company and the founder/co-founder of three technology start-ups. His latest entrepreneurial venture is CX-friends (https://cxfriends.com), a social network for Christian families which is being built and run by four homeschooled students under Russ' direction.