

Artificial Intelligence Holds Key To Autonomous Driving

By Sachin Lawande

Once considered a fantasy, self-driving cars are moving closer to reality. Thanks to technology advancements, the question no longer is whether autonomous vehicles will one day be commonplace on roads, but rather when. As the buzz about autonomous cars grows louder, some are asking, “why do we need autonomous vehicles?” and “what technology holds the key to their success?”

Autonomous driving is evolving not from a want, but from a need – to improve the quality of life by addressing road congestion and safety. Approximately 1.3 million people around the world die each year in road crashes, and millions more are injured. It may take many years before fully autonomous cars occupy our roads and highways. But their potential for reducing accidents by handling difficult road and traffic conditions better than people, and avoiding human error cannot be overlooked.

Self-driving cars also offer the potential to make better use of one of society’s most underutilized assets. (Most cars sit idle 96 percent of the time, according to Uber.) Autonomous vehicles hold promise as cost-effective transportation options, as part of a future mobility model that relies heavily on car-sharing and vehicles-on-demand.

Beyond ADAS: Technology Challenges and Opportunities

Autonomous driving poses two main technology challenges: Monitoring what is happening around the vehicle, and executing the driving function. Perhaps surprisingly, the execution is actually relatively easy. However, monitoring and planning the car’s path is incredibly difficult.

The industry’s current suite of advanced driver assistance systems



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(ADAS) relies mainly on radar and cameras to warn drivers of pending collisions, and to control certain features such as steering and brakes. Yet, most current ADAS products are not capable of accurately detecting and classifying objects – such as cars, pedestrians or bicycles – at a level required for autonomous driving. Monitoring the environment and negotiating it safely poses the biggest challenge to autonomous driving, and requires new capabilities in computing and image processing.

Where does the solution lie? The answer is machine learning, a subset of artificial intelligence (AI), which focuses on creating computer software that is capable of intelligent behavior. What makes artificial intelligence ideal is that the algorithms – the software that implements the



task of object detection and classification – keep getting more precise and accurate as they gain in experience and collect more data about the road environment. In theory, this means autonomous cars can be “trained” to eventually be better at driving than humans.

Our Path To Autonomous Driving

As a leading vehicle cockpit electronics supplier, Visteon recognizes the promise of artificial intelligence, and is driving to be a top supplier in AI and machine learning-based solutions for autonomous driving for automobiles. Our initiative to develop artificial intelligence-based autonomous driving technology is led by a team out of Germany and supported by engineering teams in Silicon Valley in the US, and in India.

Visteon’s approach to autonomous driving encompasses three elements:

- Creating fail-safe, centralized domain controller hardware that provides a high degree of scalability in terms of computing power, and offers integration of data from multiple cameras, Lidar and radar sensors.

- Unlocking the innovation potential of algorithm developers through an open framework for sensor-based AI algorithm development, complemented by a test and simulation environment.
- Applying artificial intelligence for object detection, classification, perception and decision-making in autonomous vehicles.

This new technology platform from Visteon is called DriveCore, and it consists of the hardware, middleware and frameworks to develop machine learning algorithms for object classification, detection, path planning and execution.

DriveCore is targeted at autonomous driving applications of Level 3 and above, and is unique in its approach of providing an open platform for the development of sensor-based solutions for the automotive industry.

We believe that successful implementation of autonomous driving technologies will require collaboration from multiple companies that offer specific expertise in different aspects of the solution. Visteon has deep expertise in developing auto-grade solutions for cockpit electronics, and with the investments made in new technologies such as machine learning, is in a unique position to address the new challenges of the industry.

Visteon plans to launch its autonomous driving platform at CES in Las Vegas in January 2018. We look forward to opening a new era in the collaborative development of autonomous driving solutions. By doing so, we will be helping the industry steer toward a future of autonomous driving that holds great promise for the industry – and for society. **APA**



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