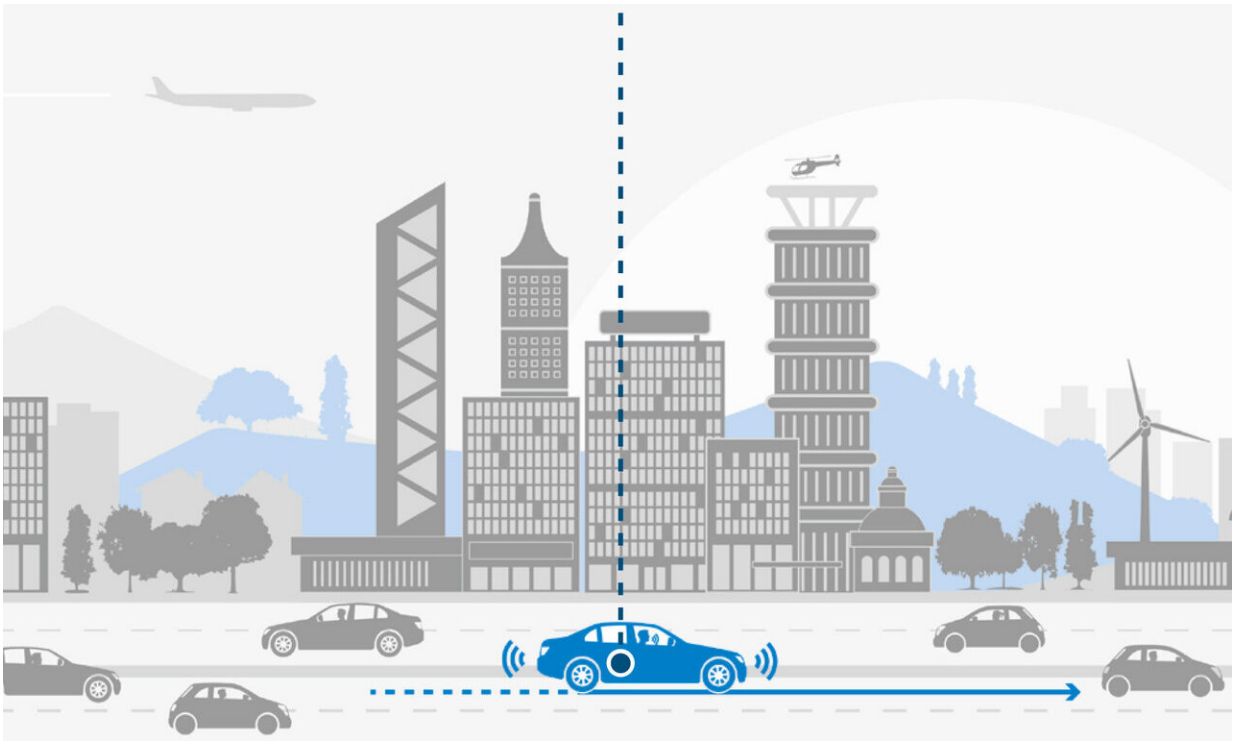
Companies spell out guiding principles for autonomous cars to be safe

July 5 2019, by Nancy Cohen



Credit: Intel

"Safety First for Automated Driving" has been compiled by 11 authors representing automotive and mobility industry thought leadership.

This work is not a literature review. It's not a milestones report of yesterday and tomorrow. While there is no shortage of publications on

the topic of self-driving cars, the authors carry their own mission: It's a framework for safety in automated passenger vehicles, where industry players are looking closely and carefully at safety by design.

What is still missing from existing literature, they stated, is verification and validation of such systems. While the authors represent different companies, they share a goal of "industry-wide standardization of automated driving." Their intended audience? That would include regulators, automated-driving industry players, insurance companies and—not leaving anyone out—"any persons involved in later standardization efforts."

Intel was among the companies represented in the list of authors. "We are proud to have contributed to the groundbreaking work to establish a framework for introducing automated vehicles that are safe by design," said Intel's Jack Weast, senior principal engineer.

The document, while addressing the technical, was clearly written and often stated sobering analyses of where the industry is in safe self-driving systems. At the heart of the document are 12 principles that all self-driving vehicles should adhere to moving forward.

"Existing standards do not present solutions to some of the most problematic topics of automated driving systems," said the authors, "such as the safety assurance of artificial intelligence (the most relevant algorithms derive from the fields of machine learning and neural networks, see Appendix B), human factors and psychology, and the technological capability of the sensory devices used as inputs to the automated driving system."

To be sure, it is safe to say that no discussion of potential guidelines for safety would be complete without reference to the deep neural networks used for automated driving systems.

"Machine learning...is seen as a crucial technology for automated driving systems," they wrote. "Consequently, the development process for machine learning algorithms responsible for executing safety-related tasks of automated driving systems must undergo strict assessment."

Another topic for highlighting has to do with cybersecurity. We get a lot of information about hijacked computers but what about addressing risks of highjacking fleets of cars?

"The automotive industry is facing new challenges in automated driving due to the extreme connectivity within automated driving vehicles and between those vehicles and their operating environment." They said the challenges included ensuring safety to protecting fleets and customers from cybersecurity attacks.

"Connectivity additions include new interfaces between the control functions of connected vehicles, IT backend systems, and other external information sources," they wrote. "This rich attack surface creates considerable interest for malicious actors with various goals...Most importantly, cybersecurity principles and practices should be applied to ensure that attackers cannot gain arbitrary control of a vehicle's movement and that attacks are exceptionally difficult to scale to the point of simultaneously exploiting multiple vehicles."

In reading the document, *TechSpot* cut to the chase, asking, "Is the industry attempting to regulate itself?"

Cohen Coberly in *TechSpot* recognized that the document was talking about that delicate balance of driver responsibility and system responsibility in self-driving automobile safety.

He wrote that "these principles aim to blend user and vehicle responsibility, ensuring that a driver knows what's expected of them at

all times—for example, explicitly informing them when a manual take-over is necessary—while preventing the vehicle's autonomous systems from putting drivers in harm's way in the first place."

It is not certain how many car makers will adopt the 12 principles laid out in the paper but Coberly commented that "given the many controversies that have surrounded self-driving cars over the past couple of years, self-regulation like this will probably seem preferable to government intervention."

Sasha Lekach, *Mashable*, delivered a description of what subjects are covered by the 12 guiding principles: safe operation; operational design domain; vehicle operator-initiated handover; security; user responsibility; vehicle-initiated handover; interdependency between the vehicle operator and the automated system; safety assessment; data recording; passive safety; behavior in traffic; and a safety layer.

More information: newsroom.intel.com/news/intel- … framework/#gs.nlfdlo

newsroom.intel.com/wp-content/ … utomated-Driving.pdf

Citation: Companies spell out guiding principles for autonomous cars to be safe (2019, July 5) retrieved 10 April 2024 from https://techxplore.com/news/2019-07-companies-principles-autonomous-cars-safe.html