

# Autonomous Vehicle and Risk Assessment

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**A new means of transportation is emerging – autonomous vehicles. They are believed to reduce accidents by removing the component of human factor. However, there are some challenges before autonomous vehicles can be privately or commercially used. Ensuring safety is an issue the technology has to overcome. Not only that, security risks are arising as being autonomous opens up new doors for malicious attackers.**

Self-driving car is a hot topic nowadays. It is however not the only vehicle type that is up-and-coming. Fully autonomous ships are on their way, autonomous trains exist but is limited and autonomous drones will possibly be used for a lot of things in the near future. What they mutually have in common is that they must overcome safety and security issues. In order to validate safety and security, an appropriate risk assessment method is necessary.

The Risk Assessment for Autonomous Vehicle (RAAV) framework is a method especially constructed after autonomous vehicle systems. The framework is based on other researcher's models, but customized and adapted to become as holistic and comprehensive as possible. Its structure is composed of several matrices, each matrix gives a different point of view to the risk assessment process. The matrices involve the vehicle's functions, structures, failures and attacks. Both safety and security are addressed in the framework, and more importantly, correlated to each other. Majority of risk assessment models that exist about autonomous vehicle divide the two fields as if they have nothing in common. The fact is that safety issues can trigger security issues, and vice versa. Even in the industry, safety and security are split into different departments. The RAAV framework is thus constructed to be able to separate attacks and failures to be worked on separately, but forces collaborations during certain steps. The framework is also adapted to modern risk science and covers all three of the essential risk assessment steps; identification, analysis and evaluation.

In order to create the RAAV framework, a literary study was conducted and consultative interviews were held. It was found from the literary study that research on risk assessment for autonomous vehicle is relatively new. It is new to the degree that no result was found about risk evaluation, which is the last step of the risk assessment process. Moreover, there exists no model that most researchers agree upon. This indicates that the subject is in its initial state and there is room for improvement. The results from the interviews showed that industry is more or less at the same stage. The RAAV framework has thus collected and compiled the current knowledge and transformed it to be used as a starting point for industries when assessing risk for autonomous vehicles.