Towards a Scenario-Based Assessment Method for Highly Automated Driving Functions

Current research into highly automated driving (HAD) functions aims to support drivers in various situations. These functions are devised to master different scenarios including traffic participants and environmental conditions. The challenge in this context is to guarantee a fault-free operation within this indefinite number of scenarios and estimate the risk of a collision caused by driverless vehicles. Current risk assessment methods are not capable of assessing the performance of the HAD functions within the scenario space. This lack of valid assessment methods motivated the setting up of research partnerships such as the German PEGASUS project in order to measure the improvement of traffic safety. In this research we communicate our method for validating the scenario space using multiple test domains. The first part discusses the requirements towards a scenario description, transferring the test space into a scenario-depending representation which enables the comparison of scenarios across test domains. The second part introduces an evaluation system based on key performance indices for functional, legislative, and system-dependent criteria regarding the HAD functions thus determining the performance per scenario. The
paper concludes with the proposal of a novel approach towards how highly automated driving functions can benefit online from the evaluation process during drive time.

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