VERIFICATION
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METHODS

PROJECT of the PEGASUS FAMILY

METHOD FOR RISK-BASED SELECTION OF RELEVANT AND REPRESENTATIVE TEST CASES

An approach how to sample test scenarios out of a set of logical scenarios

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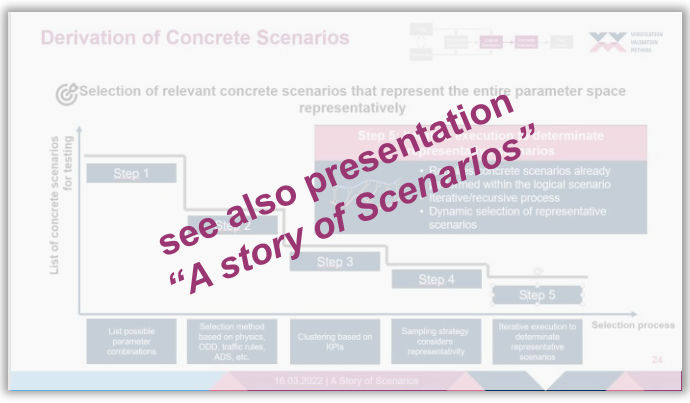
Motivation

An efficient test concept is a key enabler for the market introduction of ADS. The safety assurance uses a scenario-based testing approach but needs a solid rationale on the selection process for the test cases. To build such a solid and traceable test case selection process a method consisting of four sequential steps is proposed.

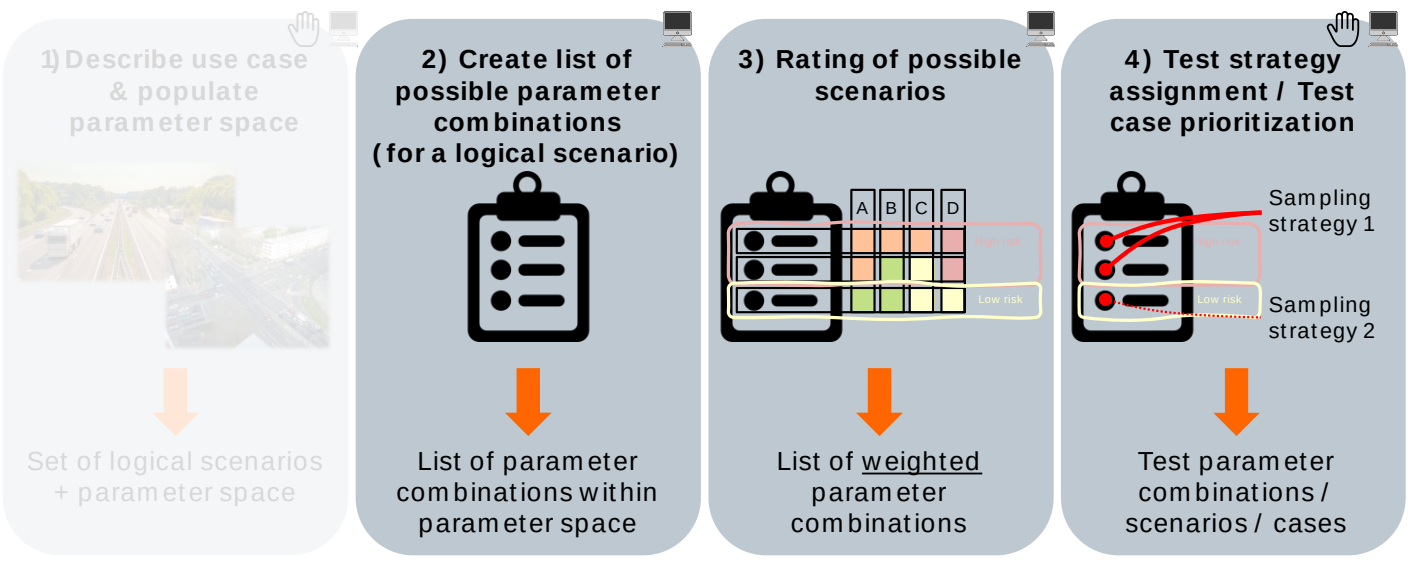


Proposed method

In step 1, the ADS use case is used to define a set of logical scenario and existing datasets are used to analyze their parameter spaces focusing which parameter combinations occur under real-world operational conditions for the logical scenario (and how often).

In step 2, a list of possible parameter combinations is compiled individually for each logical scenario based on the considered parameters. This includes extrapolating parameter distributions to consider edge cases in the list that may not be found in real-world data. In addition, the list compilation should include methods to keep the list as short as possible, but as long as necessary.

Steps 3 and 4 build the core of the method by automatically evaluating the possible parameter combinations inside of a logical scenario. The evaluation may be based on the risk of individual parameter combinations regarding their frequency, potential outcome and driving demand to solve the scenario. Clustering the parameter combinations based on various criteria enables choosing cluster-individual sampling strategies, e.g. wider sampling in low-risk clusters and narrow sampling in high-risk clusters.



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