Framework for using real driving data in automotive feature development and validation

The increasing complexity and interconnectivity of automotive features raises the significance of comprehensive Verification and Validation (V&V) activities. High-level automotive features use the information provided by complex environmental perception sensors and systems. Due to the rising number of these sensors and the usage of enhanced digital maps, System level V&V for high-level features has become a challenge, that is often tackled by a combination of real world tests and simulation approaches. In this contribution we present a method, that combines the realism of real world tests with the scalability of simulation approaches. In the presented framework a feature under development is executed in a Software-in-the-loop (SIL) environment with the help of recorded real world driving data. With the steadily growing pool of recorded test drives from test campaigns and country approvals, large scale simulations have been facilitated. This enables statistically significant assertions, continuous maturity tracking as well as geolocation-dependent evaluation of the feature under test. The framework makes these large scale simulations feasible during automotive feature development by utilizing parallelization concepts to
achieve simulation speeds of thousands of kilometers within minutes and by reducing adaptation overhead for changes in the feature's software code to a minimum.