Preparing field operational tests for driver support systems: a research-oriented approach

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Abstract

A methodology for preparing and performing field operational tests (FOTs) of new-vehicle systems was developed by the European FESTA project. Currently several large FOTs are being performed in Europe and North America and Australia. With the growth of in-vehicle electronics and the advances in sensor technology, FOTs can collect huge amounts of data on driver and vehicle behaviour, as well as on driving context. Just collecting large quantities of data may not answer all the questions stakeholders have about the impacts of system use, and the data may also not lead to increased understanding. FESTA advocated a structured approach, starting with identifying the functions to be tested, followed by the definition of use cases and the formulation of research questions and hypotheses. All of this should precede definition of the experimental design of the study. However, in practice it turns out that it is not easy or straightforward to identify these questions and to formulate sensible hypotheses that can be tested statistically. To support the process of hypotheses generation, a systematic procedure was developed in FESTA: top-down, considering six areas of system influence, and bottom-up, developing scenarios. It is recommended that a multi-disciplinary team works jointly and iteratively with these two approaches. The practicality of investigating these hypotheses is subsequently checked by selecting appropriate performance indicators which can be used to confirm or refute them. The method has been successfully tried out in several workshops (including in the FOT-Net support action). The paper describes the FESTA methodology, the method for generating hypotheses and the experiences with the method. One issue discussed is the even more complex process of identifying hypotheses for a combination of driver support systems.

Introduction

Field Operational Tests (FOTs) are large-scale evaluations of new driver assistance systems, which aim to provide confirmation or refutation of the benefits of these systems in terms of safety, the environment and traffic operations, as well as of such user-related aspects as usage rates, driving comfort, acceptance and willingness to pay. They often culminate in a cost benefit analysis. The FESTA Handbook (FESTA Project, 2008) defines an FOT as "a study undertaken to evaluate a function, or