The GIDAS Pre-Crash-Matrix 2016

Innovations for standardized pre-crash-scenarios on the basis of the VUFO simulation model VAST

Author: Dipl.-Math. Angela Schubert*
Co-Authors: Dipl.-Ing. Henrik Liers*
Dipl.-Ing. (FH) Marcus Petzold*

* Verkehrsunfallforschung an der TU Dresden (VUFO) GmbH
Semperstraße 2a
01069 Dresden

Email: angela.schubert@vufo.de
Tel.: +49 (351) 43 89 89 29
Fax: +49 (351) 43 89 89 99

Abstract

Since its creation in 2011 the Pre-Crash-Matrix (PCM) offers the possibility to observe the pre-crash phase until five seconds before crash for a wide range of accidents. Currently the PCM contains more than 8.000 reconstructed accidents out of the GIDAS (German In-Depth Accident Study) database and is enlarged continuously by more than 1.000 cases per year. Hence, a detailed investigation of active safety systems in real accident situations has been made feasible.

The PCM contains all relevant data in database format to simulate the pre-crash phase until the first collision of the accident for a maximum of two participants. This includes the definition of the participants and their characteristics, the dynamic behavior of the participants as time-dependent course for five seconds before crash as well as the geometry of the traffic infrastructure.

The digital sketch of the accident and information from GIDAS as well as from supplementary databases represent the main input for the simulation of the pre-crash phase of an accident with the VUFO simulation model VAST (Vufo Accident Simulation Tool). This simulation in turn embodies the foundation of the PCM. The PCM underlies continual improvements and enhancements in consultation with its users.

In addition to collisions of cars with other cars, pedestrians, bicycles and motorcycles the PCM now also covers car to object and car to truck collisions. The paper illustrates car to truck collisions as a showcase and explains perspectives for further developments.

In 2016 a more detailed definition of the contour of the vehicle was added. Furthermore, the geometrical surroundings of the accident site will be provided in a new structure with a higher level of detail. Thus, a precise classification of road marks and objects is possible to further improve the support of developing and evaluating ADAS.

This paper gives an overview about the latest developments of the PCM with its innovations and provides an outlook to upcoming enhancements. Besides potential areas of application for the development of ADAS are shown.