

Using Data Mining in Automotive Safety

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Abstract : Safety is one of the most important considerations when buying a new car. While active safety aims at avoiding accidents, passive safety systems such as airbags and seat belts protect the occupant in case of an accident. In addition to legal regulations, organizations like Euro NCAP provide consumers with an independent assessment of the safety performance of cars and drive the development of safety systems in automobile industry. Those ratings are mainly based on injury assessment reference values derived from physical parameters measured in dummies during a car crash test. The components and sub-systems of a safety system are designed to achieve the required restraint performance. Sled tests and other types of tests are then carried out by car makers and their suppliers to confirm the protection level of the safety system. A Knowledge Discovery in Databases (KDD) process is proposed in order to minimize the number of tests. The KDD process is based on the data emerging from sled tests according to Euro NCAP specifications. About 30 parameters of the passive safety systems from different data sources (crash data, dummy protocol) are first analysed together with experts opinions. A procedure is proposed to manage missing data and validated on real data sets. Finally, a procedure is developed to estimate a set of rough initial parameters of the passive system before testing aiming at reducing the number of tests.

Keywords : KDD process, passive safety systems, sled test, dummy injury assessment reference values, frontal impact

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