

1 Introduction

In order to fulfill the constantly growing number of requirements on a vehicle, new development methods and strategies must be developed. Demands to save time in developing a car and the decreasing number of physical prototypes are additional facts that force virtual development methods. Therefore different numerical methods are used during the entire vehicle development process – starting in the concept phase up to the serial development phase. Thanks to different research activities in the last years, the predictability of the different numerical methods reached a higher level. In parallel powerful supercomputers and advanced solver technologies support the virtual development process and assure the virtual development strategies in the automotive industry. Another important factor to realize the virtual development process is the availability of the therefore necessary simulation data. This includes for example geometry data, detailed material data, knowledge about the structure of the product, information about dependencies and connections like spot welds, or different production technologies.

The improvement of existing development methods, the according process and simulation data management are challenges for the next few years. Through the combination of all these topics, a continuous CAE process for every engineering discipline can be achieved. Tools and methods to support the entire development process and to assure the availability and integrity of data are key issues for future research activities, [1], [2]. Additionally, visualisation strategies regarding results for the different development topics and the combination with complex change management during the development are belongings of future topics.

This paper deals with linked topics in the field of pedestrian protection simulation. A number of numerical methods and strategies to accomplish an integrated development process will be presented. Challenges in the field of numerical methods regarding pedestrian protection development are pointed out. Numerical algorithms and methods for pre- and post-processing and also technologies to automate the simulation process are demonstrating potentials in the field of numerical processes. On the other hand methods to manage simulation data during the development process and strategies for data exchange with extern partners will be presented. The link of process automation technologies and simulation data management as a key factor for the future for pedestrian protection development will be explained. All these topics are requirements for multidisciplinary optimization technologies and the basics for an integrated development process.