Stochastic Methods in Airbag Algorithm Simulation: The Monte Carlo Approach

Hermann Küblbeck[1], Christian Held[2], Carmen Maurus[3],
Ralf Reuter[4], Mario Götz[5]

Abstract

Stochastic simulation is a powerful tool for the description and analysis of complex systems. The application of Monte Carlo methods to the simulation of the firing behaviour of airbag control units consists of a stochastic modeling of factors of influence such as tolerances and scatter, independent random sampling according to the respective distributions and application of the deterministic simulation of firing times to the sampled constellations. The output is evaluated statistically. This process allows an analysis of the system's firing behaviour under real-world conditions and, thus, the validation and robustness assessment of the airbag algorithm and its calibration.

[1]Conti Temic microelectronic GmbH
[2]Conti Temic microelectronic GmbH
[3]University of Eichstätt-Ingolstadt
[4]EASi Engineering GmbH
[5]Conti Temic microelectronic GmbH and University of Eichstätt-Ingolstadt