

STS 12

Credible Computational Modelling and Simulation Supporting Decision Making in the Automotive Industry

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Session Abstract

Keywords: *Automotive design, Uncertainty Quantification techniques, data-driven models, model-driven data*

Technical decisions for automotive design, manufacturing and production rely on Computational Models and Methods. They provide digital twins substituting (part of) the more expensive and time-consuming experimental tests. Although these methodologies are currently embedded in the industrial practice, the challenge is still to assess and control their credibility and to devise smart strategies to complement experimental data and to receive feedback from them. This is strongly depending on the credibility of the models. The concept of credibility in the simulation accounts for the intrinsic uncertainty of the system (thus, it pertains to the Uncertainty Quantification techniques and the stochastic modelling) and also for the errors associated with the numerical solver (discretization, truncation...) and the input data (measurement errors, aleatoric nature...).

This STS aims at discussing the techniques allowing to quantify, control and enhance the credibility of the models in the Industrial Automotive context, as well as to analyse the use of data to update the models (data-driven models) and the use of models to complement, enrich and better understand data (model-driven data).

Foreseen session paper titles and speakers:

The UPSCALE Project - Application of Artificial Intelligence Enhanced CAE Tools in Vehicle Development

Enric Aramburu, IDIADA Automotive Technology SA, Spain

Uncertainty Quantification of Crashworthiness Simulations *(to be confirmed)*

Marc Rocas, Centro Tecnico de SEAT S.A., Martorell, Spain

Proper Generalized Decomposition (PGD) for Inertia Relief Problems and Parametric Modal Analysis (UPSCALE Project)

[Fabiola Cavaliere](#), Sergio Zlotnik, LaCaN, UPC Barcelona, R. Sevilla, Swansea Univ., UK,
Xabier Larrayoz, Centro Tecnico de SEAT, Martorell, Spain, Pedro Diez, UPC, Barcelona, Spain