
Automated Simulation cycle from CAD files to Report.

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ABSTRACT

Nowadays FEA simulation results have reached a level of accuracy comparable to physical testing. The cost of the above fact is that models complexity has increased, as the tremendous progress of information and computer technology allowed so. Throughout product design cycle, engineers often have to judge the performance of many design variants by going through numerous Finite Element Analyses. This necessity leads to the need for the automation of the pre- and post-processing of FEA so that errors and turnaround times are reduced and quality and productivity are drastically improved.

This paper demonstrates how ANSA pre-processor and μETA post-processor of BETA CAE Systems S.A. are efficiently used in the Automotive Industry for the automation of analysis processes, all the way from CAD data input to CAE results report generation.

It is demonstrated how part of the above automation is achieved with ANSA pre-processor scripting language that is simple and easy to learn and yet has the sophistication of contemporary object oriented languages. In addition to this, it is shown how the post-processing functionality of μETA is automated by its own session files. These two integrate the pre- and post-processing operation into a complete process.

Briefly, the automated process steps that will be presented are:

- CAD data collection from various sources with simultaneous parts and properties management.
- Import geometry from CAD files
 - Automatic geometry clean-up in a single step,
 - Extraction to middle surface of sheet metal parts,
- Batch Meshing,
- BiW panels welding,
- Model's sub-systems assembly,
- Load case and analysis scenario definition,
- Quality checking and automatic improvement,
- Analysis solving,
- Post-processing of analysis results for model and results validation,
- Reports generation.

keywords: Batch Meshing, Pre-processing, Post-processing, BiW Assembly, Report generation