

in collaboration with
Centro di Simulazione Numerica Avanzata – CeSNA
Istituto Universitario di Studi Superiori

Finite element formulations and computational strategies in the numerical simulation of plastic forming processes of metallic parts

This presentation intends to present an overview of the research activities currently being developed within the GRIDS Research Group (Department of Mechanical Engineering, University of Aveiro, Portugal), particularly focusing on the numerical simulation of plastic forming processes for industrial applications.

The discussion starts with the main concepts behind the development of shell, solid and “solid-shell” finite element formulations based on the Enhanced Assumed Strain (EAS) method, for general structural problems. Later on, numerical strategies for the accounting of planar anisotropic plasticity (for steel and aluminum alloys) as well as large deformations and shape changes, typical of sheet metal forming of metallic blanks, are also presented with a focus on the implementation of those concepts in both in-house and commercial finite element software codes.

Finally, some examples are presented, ranging from validation academic test cases onto industrial problems (automotive, beverage cans, etc.), involving either conventional as well as more “alternative”, small scale, forming techniques such as tubular hydroforming and incremental sheet forming.

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MS1 Conference Room,
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Via Ferrata,1 – Pavia

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