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USING IGATOOLS IN INDUSTRIAL ENVIRONMENTS: INTEGRATION WITH EXISTING CAD SYSTEMS AND FINITE ELEMENT SOLVERS.

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igatools is an object oriented C++11 general-purpose isogeometric library developed by the University of Pavia and the IMATI-CNR "Enrico Magenes" of Pavia.

One of the biggest practical strength of an isogeometric method (IGM), is the fact that it can be viewed as generalized finite element method (FEM) in which the basis functions are more regular. The similarity between IGM and FEM permits to enhance an existing finite elements solvers with isogeometric capability quite easily and without breaking the classical finite element assembling strategy: loop over the elements → computation of the local (element-based) operators → assembling of the global operators from the local one.

In the talk will be addressed how a CAD system can be integrated with igatools and how a finite element solver can be adapted in order to use isogeometric concepts and techniques provided by igatools.

In particular, we present some details about the integration of the isogeometric library igatools in an industrial environment based on the existing geometric modeler IRIT[1] and on the non-linear elasticity finite element solver FEBio[2]. Finally, we present some examples and results about using FEBio with the isogeometric capabilities provided by igatools in the context of quasi-incompressible materials.

REFERENCES

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