Integrating CAD with Abaqus: A Practical Isogeometric Analysis Software Platform for Industrial Applications

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ABSTRACT

Isogeometric analysis (IGA) has been developed for more than a decade. However, the usage of IGA is by far limited mostly within academic community. The lack of automatic or semi-automatic software platform of IGA is one of the main bottlenecks that prevent IGA from wide applications in industry. In this paper, we present a comprehensive IGA software platform that allows IGA to be incorporated into existing commercial software such as Abaqus, heading one step further to bridge the gap between design and analysis. The proposed IGA software framework takes advantage of user-defined elements in Abaqus, linking with general .IGES files from commercial computer aided design packages, Rhino specific files and mesh data. The platform includes all the necessary modules of the design-through-analysis pipeline: pre-processing, surface and volumetric T-spline construction, analysis and post-processing. Several practical application problems are studied to demonstrate the capability of the proposed software platform.

REFERENCES

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