

ISOGEOMETRIC METHODS FOR SOLIDS, STRUCTURES, AND FLUID-STRUCTURE INTERACTION

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This presentation is focused on Isogeometric Analysis (IGA) [1] with applications to solids and structures, starting with early developments and results, and transitioning to more recent work. Novel IGA-based thin-shell formulations are discussed, and applications to progressive damage modeling in composite laminates due to low-velocity impact and their residual-strength prediction are shown. Fluid--structure interaction (FSI) [2] employing IGA is also discussed, and a novel framework for air-blast-structure interaction (ABSI) based on an immersed approach coupling IGA and RKPM-based Meshfree methods is presented and verified on a set of challenging examples. The presentation is infused with examples that highlight effective uses of IGA in advanced engineering applications.

REFERENCES

- [1] J.A. Cottrell, T.J.R. Hughes, and Y. Bazilevs, “Isogeometric Analysis. Toward Integration of CAD and FEA”, Wiley 2009.
- [2] Y. Bazilevs, K. Takizawa, and T.E. Tezduyar, “Computational Fluid--Structure Interaction: Methods and Applications”, Wiley 2013.