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ISOGEOMETRIC BOUNDARY ELEMENT METHODS

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ABSTRACT

Isogeometric analysis [1] has recently gained popularity within the computational engineering and computational geometry research communities driven by the significant efficiency gains realised through integrated design and analysis software. Several researchers have demonstrated the benefits of adopting an isogeometric boundary element (BE) formulation whereby the need for only a surface discretisation provides a natural link with computational geometry formulations that are predominantly based on surface representations. Much of the initial research into isogeometric boundary element methods focussed on the use of NURBS as a discretisation technology [2], but other formulations have since been developed using T-splines and subdivision surfaces. One of the most challenging features of isogeometric discretisations is simultaneously satisfying both geometrical design and analysis requirements but much progress has been made on methods that exhibit a high degree of control in refineability while retaining an exact geometry representation. Isogeometric BE methods exhibit additional challenges over volumetric methods, most notably how to handle kernel singularities that lead to challenges including numerical integration of high-order functions and large dense matrices. Several international research groups have made significant progress in each of the preceding research challenges.

The present mini-symposium aims to attract researchers working on isogeometric boundary element methods to present results on topics that may include: discretisation technologies, optimisation algorithms driven by isogeometric BE analysis, new BE applications that benefit from an integrated design and analysis model, coupled methods that utilise an isogeometric boundary element method and acceleration technologies that reduce the overhead of isogeometric BE formulations.

REFERENCES

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