DESCRIPTION

Isogeometric analysis (IGA) consists of using the same higher-order and smooth spline functions for the representation of geometry in Computer Aided Design as for the approximation of solution fields in Finite Element Analysis. Now, about fifteen years after its creation, substantial works are being reported in IGA, which make it very competitive in scientific computing.

This book provides a contemporary vision of IGA by first discussing the current challenges in achieving a true bridge between design and analysis, then proposing original solutions that answer the issues from an analytical point of view, and, eventually, studying the shape optimization of structures, which is one of the greatest applications of IGA. To handle complex structures, a full analysis-to-optimization framework is developed, based on non-invasive coupling, parallel domain decomposition and immersed geometrical modeling. This seems to be very robust, taking on all of the attractive features of IGA (the design–analysis link, numerical efficiency and natural regularization), giving us the opportunity to explore new types of design.

ABOUT THE AUTHOR

Robin Bouclier is Associate Professor at INSA-Toulouse, France. His work on isogeometric analysis started during his PhD in Lyon. He has since brought this technology to the scientific landscape of Toulouse, focusing on its development for image registration and shape optimization.
Thibaut Hirschler is a post-doctoral researcher at École Polytechnique Fédérale de Lausanne, Switzerland. His research mainly focuses on the development of isogeometric modeling approaches that are suitable for designing new and innovative structures.

To purchase this product, please visit https://www.wiley.com/en-mx/9781119988540