

## Preface

The International Society for Intelligent Construction 2022 Conference (ISIC 2022) is the third ISIC international conference, following the first conference in Minnesota, USA, in 2017 and the second conference in Beijing, China, in 2019. This conference is organized under the umbrella of the International Society for Intelligent Construction (ISIC) following the mission:

“... promote intelligent construction technologies applications to the life-cycle of infrastructure: from the survey, design, construction, operation, and maintenance/rehabilitation by adapting to changes of environments and minimizing risks. The goals of its mission are to improve the quality of construction, cost-saving, and safety.”

ISIC 2022, under the Theme “TRENDS ON CONSTRUCTION IN THE DIGITAL ERA”, is organized by The University of Minho with the support of BUILT CoLAB and is held in the city of Guimarães, a UNESCO World Heritage Site, in Portugal, from 6 to 9 September 2022.

We take a holistic approach to integrate several fields classified in the following themes: Artificial Intelligence for Design and the Built Environment, Building Information Modelling (BIM) and Construction Automation and Robotics, Intelligent Construction, Sustainable Construction, Sustainable and Smart Infrastructures.

In summary, through the 38 articles, several topics are presented and discussed.

– The application and use of Artificial Intelligence (AI) and Machine Learning (ML) techniques and technology. This includes contributions on topics such as digital technology; digitization; project management; construction; structure and sustainability. In particular, we can highlight: the design of tools that use ML to develop budgets; the use of Blockchain technology; the use of AI techniques applied to project management; forecasts in different contexts of material and pavement development and geological conditions. It can be seen that, right now, AI and ML are strongly driving the design of new tools that add value and open new frontiers of knowledge.

- BIM is definitely playing an important role in intelligent construction. Contributions within this theme include topics such as connection to structural analysis through BIM, but also the relevant aspects of facility management-oriented modelling.
- The construction automation and robotics address the challenges and emerging technologies that are boosting the fields of additive manufacturing and construction and automation, exploring fundamental issues related to the design, conception, and realization of architectural structures. The contributions cover facades designs and improvisation in collective human–robot construction.
- The intelligent construction addresses a sustainable construction evolution, from traditional methods to more reliable and efficient methodologies supported by the digitalization of processes and workflow in several fields of construction, also made use of constitutive modelling towards performance-based intelligent construction processes.
- The sustainable and smart infrastructures address the ambition of progress in the incorporation of smart systems in the construction phase as well as in the life monitoring of infrastructures, adopting adaptive fuzzy inference system for automated condition evaluation, using advanced evaluation equipment, monitoring rockfall protection with shock sensors and radar technology, and supporting structural health monitoring with artificial neural network.

The editors hope that this volume of proceedings will provide a foundation and impetus for the next series of international conferences on a topic where intelligent construction, part of the digital era, will contribute to sustainable construction with societal benefits by improving the well-being of people in their physical environments.

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