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Ian F. C. Smith · Bernd Domer (Eds.)

Advanced Computing Strategies for Engineering

25th EG-ICE International Workshop 2018
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Proceedings, Part I

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Preface

The architecture–engineering–construction (AEC) industry worldwide spending is over ten trillion dollars annually[1]. The industry is the largest global consumer of raw materials, and constructed assets account for 25–49% of the world's total carbon emissions[2]. Also, the World Bank has estimated that each year, demand for civil infrastructure exceeds supply (new plus existing infrastructure) creating an annual shortfall of one trillion dollars[3]. This cannot continue. Engineers must find new ways to design, build, manage, renovate, and recycle buildings and civil infrastructure.

Advanced computing strategies for engineering will be the enablers for much of this transformation. Until recently, new computing strategies have not been able to penetrate into the AEC industry. Owners and other stakeholders have observed little return on investment along with excessive risk associated with a fragmented industry where computing competence is far from homogeneous. This is changing quickly as efficient information modeling, the foundation of many computing strategies in this field, becomes more accessible. Also, important advances in fields such as construction management, life-cycle design, monitoring, diagnostics, asset management, and structural control are being made thanks to fundamental computing advances in fields such as machine learning, model-based reasoning, and human–computer interaction. In parallel, studies of full-scale AEC cases are uncovering additional scientific challenges for computer scientists.

The European Group for Intelligent Computing in Engineering (EG-ICE) was established in Lausanne in 1993 to promote research that lies on the interface between computing and engineering challenges. The primary goals of the group are to promote engineering informatics research across Europe by improving communication and trust between researchers, fostering collaborative research, and enhancing awareness of recent research. The EG-ICE group maintains contact with similar groups outside Europe and encourages contact with experts wherever they reside.

This volume contains papers that were presented at the 25th Workshop of the European Group for Intelligent Computing in Engineering (EG-ICE), which was held in Lausanne, Switzerland, June 10–13, 2018. Of the 108 abstracts that were submitted, 57 papers made it through the multi-step review process of evaluating abstracts, commenting on full papers, and assessing subsequent revisions so that they could be presented at the workshop.

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[1] https://www.statista.com/statistics/788128/construction-spending-worldwide/.

[2] Shaping the Future of Construction, World Economic Forum, Geneva, 2016.

[3] https://futureofconstruction.org/blog/infographic-six-megatrends-impacting-the-ec-industry/.

We are grateful to the many reviewers who worked hard to provide constructive comments to authors. The scientific results presented here are a sample of the diversity and creativity of those who are planting the seeds of the exciting transformation that is coming over the next decade. It is not too soon.

April 2018

Ian F. C. Smith
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