

## **Preface**

# **Advances in Computational Modelling and Data Analytics for Civil and Building Engineering**

### **Introduction from the Guest Editor**

The vast amount of high-resolution data obtained from smart sensors and devices offers significant opportunities for advancing computational modelling and data analytics for the design and construction of buildings and infrastructure. Already, various performance data have been integrated into N-dimensional building information modeling (BIM), foreseeably transforming the way society designs, constructs, maintains, and operates buildings and infrastructure. Additionally, recent advances in data analytics when processing structured and unstructured data present interesting opportunities to extract meaningful information from existing and new data sources in building and infrastructure projects.

This ACD special issue aims to review and discuss advances in computational modelling and data analytics for the design and construction of building and infrastructure projects. In particular, this issue includes extended papers presented at the 17th International Conference on Computing in Civil and Building Engineering (ICCCBE) held in Tampere, Finland, June 5-6, 2018. The conference covered a broad range of topics related to advances and innovative ideas in computing as applicable to building, structural, and construction engineering. Among many excellent papers presented at the conference, four papers were invited for extended paper publications in this special issue. The paper by Chi Yon Cho, Xuesong Liu, and Burcu Akinci discusses computer-vision techniques to recognize 2D building mechanical drawings for generating BIM models. Takashi Hara, Katsukiyo Shimomura, Keita Hamano and Shoko Miyake present the semi-automated approach to produce the design of construction scaffolding systems. The paper by Adel Francis, Edmond Miresco, and Erwan Le Meur examines the benefits of using chronographic modeling in construction project scheduling. Bogyong Lee, Hyun-Soo Lee, Moonseo Park, Changbum Ryan Ahn, Nakjung Choi, and Toseung Kim investigate how routine activity patterns of an occupant can be extracted for home automation and healthcare. In addition to extended papers from the conference, the following two papers are collected by the special issue. The paper by Songjukta Datta and Amir Behzadan discusses large crowd evacuation simulation to assist in emergency mapping and egress route assignment during design, construction, and operation of a facility. Patrick Suermann, Hriday Patel, and Like Sauter investigate the effect of space low-gravity conditions on construction techniques by simulating and visualizing drilling process.

Guest Editor

Dr. Changbum Ryan Ahn  
Department of Construction Science, Texas A&M University  
3137 TAMU, College Station, TX 77843-3137, USA  
E-mail: ryanahn@tamu.edu