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Editorial

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Smart Infrastructure and Construction

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Editorial

Jennifer Schooling

Director, Centre for Smart Infrastructure and Construction, University of Cambridge, UK

Kenichi Soga

Department of Civil and Environmental Engineering, University of California, Berkeley, USA

Smart infrastructure and construction combine physical infrastructure assets and construction processes with digital technologies to create cyber-physical systems. The resulting smart infrastructure has the ability to influence and direct its own delivery, use, maintenance and support by responding intelligently to changes in its environment. Benefits include improved design and whole-life performance, as well as greater efficiency, economy, adaptability and sustainability in the way infrastructure is delivered and operated. Since its inception in 2017, *Smart Infrastructure and Construction* has provided a forum for a global professional community of academics and practitioners to share emerging findings and innovative practice in applying and adopting the technologies, concepts and solutions to deliver smarter infrastructure construction and management.

With themed issues on big data analysis, next-generation infrastructure and computing in construction, and with general issues covering a wide range of topics from the role of digitalisation in cities to business models for smart infrastructure and structural health monitoring, the journal has delivered on this aspiration, and this issue is no exception. The papers cover design, construction and asset management aspects, and how using cyber-physical approaches offers the opportunity to address key challenges, such as avoiding errors, improving efficiency and extending asset life.

The paper by Chidambaram (2019) on using building information modelling for clash detection in rebar demonstrates the use of digital design tools to reveal issues during the design phase of a structure that would otherwise only be detected on site during construction – hence avoiding delays, improving site safety for steel fixers, saving money and reducing waste and rework.

Konstantinou and Brilakis (2019) focus on addressing the productivity gap in construction, developing a novel computer-vision-based approach to facilitate measuring and managing labour productivity. The approach allows multiple workers to be observed, and the time taken for various tasks to be accurately calculated. This has transformative potential for the construction industry, which lags behind manufacturing in carrying out ‘time and motion’ studies to accurately measure and monitor task

duration, creating a major barrier to improved productivity and efficient task and labour management. It also has potential to help identify repetitive tasks and those which may cause strain and injury, leading ultimately to improved worker health and safety.

Finally, Eskandari Torbaghan *et al.* (2019) describe development in bringing together robotics, computer vision and 3D printing to create a system for autonomously delivered road pavement repairs. This innovation brings together three exciting emerging areas to address a persistent issue in road maintenance, the ability to proactively repair detectable defects in an efficient and cost-effective way to extend pavement life and reduce costs and materials use. This is an excellent example of collaboration – between different universities, and between the universities and local authorities – to identify an issue and use a truly cyber-physical system to develop a solution to address it.

Collectively, the papers in this issue demonstrate a range of ways in which smart solutions can improve our ability to deliver designs, identify issues, manage construction processes and monitor our existing assets. Smart infrastructure and construction solutions can transform the future of infrastructure by using better data, and by using data better.

It has been our pleasure to edit this journal for the last three years, and we wish the future Editorial team all the best in building its success in this space.

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