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Editorial

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Editorial

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The 2nd International Conference on Smart Infrastructure and Construction (ICSIC), held in July 2019 in Cambridge (UK), brought together researchers and practitioners from a wide range of disciplines to share knowledge and best practices. The high-quality presentations and vibrant atmosphere led to many stimulating discussions. From the outstanding written papers and oral presentations, a few conference delegates were given the opportunity to further extend their work and contribute to a special issue in this journal, *Smart Infrastructure and Construction*. The current issue highlights three of these contributions.

The papers herein focus on three complementary challenges related to ‘smart infrastructure’: (a) data collection, (b) data interpretation, and (c) translation of data to quantifiable benefits.

The contribution by Lienhart *et al.* (2019) summarizes one of the most comprehensive implementations of fibre-optic infrastructure monitoring to date. The distributed nature of fibre-optic sensing is shown to enable efficient monitoring for a massive infrastructure project: a 27.3 km twin tunnel in Austria and the related structures. Fibre-optic cables are installed in the tunnel lining, shafts and earthen embankments, enabling a new level of monitoring resolution. The scale of this installation is impressive, but also results in data management and interpretation challenges.

The contribution by Mikhailova *et al.* (2019) addresses this challenge: how to automate data processing to enable interpretation. More specifically, the paper explores the ability of unsupervised deep learning to extract useful characteristics from structural health monitoring data. The data again comes from a fibre-optic sensing installation, but this time in the form of Fibre Bragg Grating sensors that provide 80 channels of 250 Hz strain

data for every train passing on a bridge in Staffordshire, UK. In this case, the quantity of data is transformed from a challenge to an opportunity to train the model. The potential of the method is demonstrated through effective anomaly detection.

Finally, the contribution by Pocock (2019) provides a higher-level framework to identify and quantify a wide range of potential benefits of ‘smart infrastructure and construction’. Quantifying and categorizing benefits in a manner accessible to asset owners is essential to realize a smart future for our infrastructure. This paper will certainly be of interest to researchers interested in optimizing monitoring methods and data-processing techniques, as well as practitioners and asset managers considering whether not to implement cutting-edge monitoring solutions.

The papers herein give a flavor of research presented at ICSIC 2019. For those interested, the 3rd International Conference on Smart Infrastructure and Construction will be held in summer 2023 in Berkeley, California.

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