The authors of each article included in this issue explain how their research is applicable to modern industrial practice.

Using different waste as resilient layers for impact sound insulation improvement: New alternative to commercial layers? 
FJ García-Cobos and R Maderuelo-Sanz
Nowadays impact noise is increasingly becoming an important issue. A high level of noise clearly affects indoor comfort and livability of dwellings. In order to reduce this effect, one widely used solution are floating floors in which the performance of resilient layers, in terms of impact sound pressure level reduction is a relevant issue. This article analyzed the potential use of different waste as resilient layers to be used in floating floors. These layers can adequately compete with commercially available acoustical products replacing them and showing, in some cases, better impact sound insulation performance with lower thickness.

Indoor occupancy estimation from carbon dioxide concentration using parameter estimation algorithms
Y Wei, S Wang, L Jin, Y Xu and T Ding
Occupancy estimation models developed in this study are able to calculate occupant numbers independently and accurately in a non-intrusive way based on the indoor carbon dioxide concentration. This can provide input to a predictive building controller based on the application of occupancy estimation models. This could be applied to buildings across a district, informing demand-side management systems by employing occupancy behaviour and energy characteristics of individual buildings. This could allow both utility companies and building operators to simultaneously optimise their performance and benefit from this dedicated control strategy.

A study on universal round trip time analysis for passenger demand beyond elevator contract capacity by Monte Carlo simulation
AT So
Elevator system designers, according to ISO 8100:32:2020 and CIBSE Guide D: 2020, are recommended to carry out calculation of the RTT and related parameters before any real-time computer simulation. This practice has been adopted by the elevator industry for decades. However, conventional RTT evaluation is mainly on pure incoming traffic during up-peak. The Universal RTT calculation method developed in 2014–15 extended RTT evaluation to cover dominant and complicated traffic patterns of modern buildings, but the assumed number of passengers to be handled within one round trip was limited to the contract capacity of the elevator. This article further removes this limitation to evaluate the limit of handling capacity with reasonable RTT and average passenger transit time. Then, the Universal RTT method could be more realistic and rolled out, and prevent oversizing the system design.
The safe evacuation of persons from a building operating within COVID-19 restrictions
D Brzezińska, M Barański, P Bryant and A Haznar-Barańska
The surrounding conditions for new buildings are driven by the reduction of social distances imposed by the COVID-19 pandemic. It has been found that pandemic social distancing can significantly extend the time of the evacuation of people. This article proposes a new simple mathematical algorithm for determining the evacuation parameters under pandemic restrictions, which allows the estimation of the required minimum width of emergency exits. This is a practical tool for those responsible for ensuring safety in buildings.

Securing Internet of Things devices by enabling Ethereum blockchain using smart contracts
MR Patruni and P Saraswathi
Blockchain innovations have the power to transform manufacturing, construction, healthcare and building supply chains by eliminating the middleman, streamlining operations, improving overall security, and simplifying data management. Onboarding, recordkeeping, client screening, data management, security, privacy, and transaction and trade processing are examples of several practice applications in the financial, insurance, and eHealth services industries. Thus, this study ensures security by enabling Ethereum blockchain and smart contracts in an authentic blockchain applications for building sustainable environments to improve readability and trustworthiness of the transactions.

An improvement in clash detection process by prioritizing relevance clashes using fuzzy-AHP methods
A Hasannejad, JM Sardroud, AAS Javid, T Purrostam and MH Ramesht
If clashes are not carefully detected in the design stage, project management components face a serious challenge. In this study, using the weight of clash elements and the degree of penetration of clash elements into each other, a logical and practical relationship is presented that improves the process of clash detection.

User-based fuzzy end-use modeling of indoor urban residential water demand
RD Mangalekar and KS Gumaste
The proposed methodology bypasses field measurements on water consumption to model the water demand, saving a significant amount of time and money. Moreover, it is possible to easily incorporate the changes in user characteristics and their water use habits through the Membership Functions in Fuzzy Inference Systems of the model. The model developed through the proposed methodology could be useful for pipe sizing in building water supply systems as well as for water quality monitoring in buildings.

A data-driven workflow to improve energy efficient operation of commercial buildings: A review with real-world examples
T Abuimara, BW Hobson, B Gunay and W O’Brien
Optimization of building operations has been emerging among energy management professionals as a relatively low cost means to achieve energy efficiency and minimize occupants’ discomfort. To this end, this study introduces a tool-agnostic data-driven workflow to building energy management practitioners that can assist them in achieving increased energy efficiency. The proposed workflow recognizes the interdependency of the various domains of research which have historically been treated independently.