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Building Design: Robust and Human Centered

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Deadline for manuscript submissions:
closed (30 June 2019)

Message from the Guest Editors

Over the past few decades, building design has gone through significant changes in order to increase energy efficiency—architectural changes, as well as changes in building technology. Both the complexity and capital costs have increased, while it seems that user satisfaction has decreased. In addition, it has been recognized that the desired level of energy performance is not often achieved. This effect is called the “performance gap” and has been the subject of several scientific studies and journal papers. The performance gap is primarily caused by building systems (mainly building control systems and hydronics for energy supply systems) and/or user behavior. Building design goes through an optimization process; however, we recognize that the final product is not yet robust. The interface between users and building systems is complex and not fully understood yet. The variations in user behavior are not properly considered in building design.

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Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

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