

ICO2021 Special Session

Adaptive building passive measures based on AI techniques and 5G technology for an intelligent built environment

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Session description

The need to improve the energy performance of our buildings and find means to reverse the growing trend of installation of active cooling and mechanical ventilation systems is a pressing one if the unsustainable coupling between urbanisation and carbon emissions is to be undone. Passive design is a fundamental paradigm to take to improve the energy efficiency of the building envelope as much as possible before considering other measures such as system controls and renewable energy. However, with the combined effect of climate change and microclimates, the efficacy of passive measures cannot be ascertained at all times, especially for fixed techniques such as cool roofs and external shading devices. The emerging AI techniques and 5G technology have opened opportunities to control these passive measures by using IoT sensors and a knowledge base derived from prior knowledge of the underlying building physics with respect to the thermal characteristics of the envelope and variation of climate parameters at the project location. This configuration allows dynamically modulating the building passive measures and coping with daily variations in the prevailing climate to provide a further step towards optimising the building carbon footprint.

Conference website: <https://www.icico.info/>

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