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A Framework for Building Overhang Design using Building Information Modelling and Life Cycle Assessment

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Abstract

The development of computational tools and the ability to simulate a large amount of data in relation to a variety of climatic conditions has helped to make informed decisions about alternative solutions for bioclimatic building design. At the same time, the combination of advanced design models and tools such as Building Information Modelling (BIM) and environmental assessment methodologies such as Life Cycle Assessment (LCA) offer the opportunity for undertaking holistic technical, economic and environmental approaches for the environmental design of buildings. This study aspires to deliver a comprehensive model for the optimal computational design of building overhangs through the use of an integrated building information model. The analysis is implemented for different normalized shading projection geometries, different orientations and different climatic data, using well-established BIM and LCA tools. The energy intensity indicators of the alternative overhang designs, as well as their energy depreciation time are presented. The findings of this work are expected to provide well-documented guidance on the design of overhangs for