



Computational Analytical Methods for Buildings and Cities: Space Syntax and Shape Grammar

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Message from the Guest Editors

Dear Colleagues,

This Special Issue is focussed on advanced research using two of the most famous computational methods developed for buildings and cities: space syntax and shape grammar.

Space syntax is a classic computational approach that uses graph theory mathematics to measure the social, cognitive or experiential properties of a building. Shape grammar is a well-known computational method for identifying and understanding the logic that defines the formal properties of a design or style. In essence, ‘syntactical’ methods are concerned with the spatial or topological configuration of a building and ‘grammatical’ methods with the rules that shape a building’s formal or geometric properties.

For this Special Issue, we are seeking examples of advanced research using these methods—or a combination of them alongside related approaches (isovists analysis or generative and parametric grammars)—to develop new insights into generating and evaluating design, automation, optimisation and interpretation.

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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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