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Bridging the gap between urban morphology and urban modelling

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During the last couple of decades, advances in the field of urban modelling have been linked with a shift from coarse representations of urban form based on macro-economic and social physics theories to the development of more fine-grained models capturing the dynamics of urban growth and change as a result of micro-scale transformations of the urban landscape. Indeed, the latest crop of urban models grounded in cellular automata (CA) and agent-based modelling (ABM) approaches exhibits notable similarities with the field of urban morphology in terms of its underlying conceptualization of urban form (see, for example, Batty, 2005; Parker *et al*., 2003). Both fields consider the global patterns of urban form not to be so much a reflection of macro-scale structural forces as much as an outcome of the myriad individual transformations taking place at the level of the main building blocks composing the urban environment (individual parcels in the case of urban morphology and grid cells in the case of microsimulation).

The apparent similarity in the conceptualization of the processes of urban form generation and change shared by urban morphology and urban microsimulation highlights the prospects for an intellectual marriage between the two fields by which both parties can engage in a more direct exchange of ideas and knowledge. This opportunity for interdisciplinary cross-fertilization, however, remains underexplored, with the gap between the two fields fortified by existing and seemingly insurmountable differences in traditional disciplinary approaches. The most obvious gap between the two fields is in the time horizon of their urban form investigations. While the bulk of research in urban morphology remains centred on explorations of the past, urban modelling is concerned almost exclusively with simulations of scenarios for the future. And while experimentations in both fields have tried to bridge the boundaries between the past and the future on both sides (with urban modelling venturing into 'backcasting' and urban morphology used as a guide for urban and architectural design), the main obstacle for a closer collaboration between the two fields is marked by the stark contrast in the representations of urban form dominating the two disciplines.

The highly restrictive assumptions about urban form characteristic of the early examples of urban modelling still remain a key challenge in contemporary urban microsimulation. While CA and ABM models have broken away from the aggregate zonal representation of the urban environment, the tessellation of space into abstract cells employed in microsimulation rarely matches the physical patterns of urban development. A basic recognition of the constituent elements of urban form (land ownership pattern, street networks, and building types), critical in the analysis of urban morphology, is all but absent from CA and ABM simulations. In this respect, urban morphology identifies proven and well-

trodden paths towards higher fidelity representation of the built environment, providing theoretical and empirical justification for the need to move away from the abstract representations of urban form dominating urban modelling systems today. Improving the level of realism in representing urban environments derived from the integration of urban morphological concepts in urban microsimulation can lead not only to an enhanced theoretical and empirical grounding of the models, but to a better comprehension of the model design and outcomes as well.

Conversely, urban modelling can aid urban morphological research in two ways quite significant for the development of the field. First, the knowledge derived from urban simulation can offer critical insights into understanding the dynamics of urban growth patterns, particularly in the area of land-use analysis. The study of land-use patterns, identified by M. R. G. Conzen (1960, pp. 3-10) as one of the three main components of the built environment along with the properties of the town plan and building typology, has become the neglected child of urban morphology, to a great extent due to the strong emphasis of the British and Italian schools on the analysis of the latter two urban form elements. The integration of knowledge on land-use dynamics derived from urban modelling with the understanding of the evolution of town plan and building typology gained from morphological analysis can be the critical step needed for a qualitative leap forward in our understanding of how cities grow and change. Secondly, linking urban modelling more tightly with urban morphology can highlight the importance of applying morphological concepts and knowledge in the area of urban planning and management. So far efforts to make morphological research relevant to the practice of urban planning have particularly focused on the use of morphological analysis as an inspiration for the conservation of the built environment. Urban modelling, however, can become a more powerful medium for the integration of urban morphology in the practice of managing the built environment more widely, but remaining in tune with the inspirations of Conzen and Caniggia (1963).

This is a strong case for closer collaboration between the fields of urban modelling and urban morphology. Such a way forward could be beneficial for both fields of urban research and it could improve their effectiveness as tools for understanding and managing the urban environment. This argument needs to be tested by theoretical and applied research embracing such a methodological challenge. A recent study of the growth of West London carried out by K. Stanilov and M. Batty at the Centre for Advanced Spatial Analysis at University College London appears to be a very promising start along this way. We hope that we can publish the results of this project in forthcoming issues of *Urban Morphology*.

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Typomorphology and public participation in China

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The potential of typomorphology in planning practice has attracted attention in recent years. It has been suggested that typomorphological analysis of the historical development of urban form can benefit urban landscape management (Whitehand and Gu, 2007), urban design (Chen, 2008; Chen and Romice, 2009; Samuels, 1999), urban conservation and regeneration (Bienstman, 2009;