


BOOK REVIEW

## Michael Batty, *The Computable City: Histories, Technologies, Stories, Predictions*

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Eglė Rindzevičiūtė 

Kingston University

The paperback version of Michael Batty's new book, *The Computable City*, is the size of a good brick. The generous volume affords enough space for an unrushed narration that ties together the histories of material networks used to transmit information, such as roads, telecommunication and computer networks and urban planning. Batty's practical experience of computer modelling of urban systems, as well as his passion for cities, shines through; the book opens with a historical guided tour of the spatial development of post and telecommunication systems in London and he generously shares ethnographic details of creating innovative models. However, the overall aim of this study is to challenge the techno-optimistic visions of an AI-driven 'smart city', in which all flows of transport, goods and people are smoothly controlled by automated systems. Batty is highly critical of 'smart-city' discourse. He argues that it is far from being clear when – and if – computer power will be able to accommodate the complexity and uncertainty that characterize all large cities. This is a welcome caution in the context of mega-investments that project a lot of hope to reap profits from AI and automation innovations, such as driverless cars. Furthermore, this caution is useful in the context of the political debates, where the relation between different forms of movement – public transport, cars, cycles and pedestrian – are being negotiated and where the urban infrastructure is being remodelled in response to those ideas, such as low-traffic neighbourhood schemes that have become so controversial in London and Paris. The key issue, argues Batty, is that the epistemological threshold is very high and obstructs automation: even at the time of writing in the twenty-first century, urban planners know little about how and why people move in the city. The use of public transport is probably the only area where some reliable and more or less real-time data can be had. Perhaps, writes Batty, such comprehensive, real-time data on these irregular flows will be captured through a wide spread of sensors in the future. Still, capturing data is not the same as processing it.

This is where Batty presents his key caution: the level of complexity would overwhelm the best existing computer models (software) and computers (hardware and processing power). To explain this, Batty suggests a useful distinction between low- and high-frequency cities, outlined in Chapter 9. High-frequency elements in the city are those 'that change rapidly during the day' (p. 177), whereas 'low frequency' data capture population shifts through, for instance, census surveys (p. 178). Traditional urban planning dealt with slowly evolving structures seeking to respond to and rationalize low-frequency changes. The ongoing computerization, introduction of sensors and subsequent growth of data have produced a hope – or an illusion – that the high-frequency dimension could be

made governable and become a resource for governance. As Batty puts it, ‘the city itself was becoming computable in that its functioning was being increasingly controlled by computers’ (p. 11). However, the extent of actual computer- and data-based control, argues Batty, remains low. From the computer-modelling point of view, reliable predictions of future trajectories of urban flows, even short-term ones, are unlikely – real-time decision making is even less so.

This argument is delivered through seventeen well-thought-through, highly readable chapters. The book’s four parts are organized largely chronologically, introducing basic developments in computer and information technology (Part I), techniques and ideologies of urban modelling (Part II) and the evolution of urban simulations through computer technology (Part III) with, the last, Part IV, looking at changing ideas about planning and organizing cities in relation to the most recent technological innovations. In his historical discussion, Batty does not dwell on technicalities and is light with references; instead, he gives just enough description to explain key principles of computing and modelling. The chapters about the development of computer-based modelling are perhaps the most rewarding and I wished that Batty had made this work even more autobiographical, because his career spanned several breakthroughs in the epistemology and technology of computer-based modelling. I would like to mention particularly the lucid discussion of land-use transport models that both build on the historical development of cities and simulate future development trajectories, as well as the chapter on data analytics, which demythologizes the ‘neural-network’ and ‘machine-learning’ approaches. As Batty notes, in these models ‘the term “learning” really related to the way such systems optimize performance by continued iteration’ (p. 260). He emphasizes the importance of differentiating between weak and strong AI, ‘between systems that are truly intelligent and those that look intelligent simply because they are able to amass very large quantities of data and produce patterns’ (p. 260). Batty is at his best where he clearly and convincingly outlines the limitations of geographic information systems (GIS); generative, cellular automata (CA); and agent-based models.

*The Computable City* focuses mainly on those scientific approaches and computer-modelling applications which were developed in Britain and the United States. However, it seeks to tell a general story of modern planning, of scientists’ and policy makers’ attempts to make the city computable. It is key, however, to look at the developments in other European countries with strong computer-modelling and urban-planning communities, particularly France, Germany and Sweden, as well as outside Europe. Batty is familiar with computerized urban-planning initiatives in Japan and Singapore and he refers to them in the book. He does mention the recent rise of data- and simulation-driven urban planning in China, but it would be interesting to see how contemporary Chinese computer-modeler communities have grown out from the communist experiments with cybernetic systems. Soviet and post-Soviet Russia is missing from the analysis, although the Soviets were highly ambitious to develop the computerized, systems-driven approaches to support large-scale planning. In the main, *The Computable City* will be of interest to social researchers interested in urban modelling as well as a wider readership. It is particularly recommended to urban decision makers wishing to learn more about the behind-the-scenes of big-data production and computer simulation.