

# Urbanism Beyond Cognition: On Design and Machine Learning

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## Abstract

It could be argued that the introduction of new technologies always shifts the ‘epistemological horizon’ of the different fields they impact. New instruments allow expanding the range of parameters defining a discipline’s working methods which in turn change their very definition. Design is no exception: for instance, the promises delivered by increases in data collection capacity and early computers helped Buckminster Fuller to redefine design as a planetary activity operating over large timeframes. Today the massive data storing capacities and the improvements on machine learning algorithms to mine them represent the latest development in this long series of epistemological turns. Though little design work has been occurring in this area, there is already an implicit emphasis on efficiency, which may hinder the development of more conceptual and cultural aspects of automated design.

The paper will unravel such issues by discussing the design experiments carried out in the Master in Urban Design at the Bartlett, as way to expand conversations between automation, architecture, and design. Particularly, the emphasis will be on how machine-learning algorithms open design up to spatial elements that either are beyond human perception or currently downplayed in the design process. From climate change to rapid urbanization, the speed and scale of urban transformations call for an expanded conceptual framework in which automated design processes allow us to question received classifications based on type, programme, etc., pushing the design towards more complex, fluid, open, incomplete, and embracing urban proposals.

**Keywords:** Machine learning; Urban design; Big data

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