REFORMULATING SPACE SYNTAX USING AGENT-BASED MODELLING

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0 Abstract

Representing spaces and the connectivity between them which is the heart of space syntax has inherent ambiguities which must be resolved if the method for generating connectivity values is to be automated and generalised. Equally, ambiguities concerning the use of graph theory to measure such connectivities must be clarified with respect to the use of planar and/or syntactical graphs with or without explicit representation of distance. In this paper, we develop a method in which every point in space is examined with respect to the visual fields emanating from them. The basic idea of the reformulated method is to compute the total area seen from every point, in the associated visual field or isovist. These fields can then be rank ordered in terms of their area value. Starting with the highest value, we first generate the field, we then choose the next highest value which is not in the field just generated and generate the next associated field. We continue in this way until we exhaust the entire space. The visual fields overlap and we can immediately see which fields are connected to one another. We can then produce a connectivity matrix of overlapping fields and at this point we can compute various various measures of accessibility on the graph. We propose that the best measure is one in which the farthest distance seen at each node of the graph - the centre of each visual field - represents an attractor and the actual distance from this node to a related node via the area of overlap is used as a deterrence factor. We then compute access in the same manner as in spatial interaction models. Finally the computation is done in rather novel terms using agent based simulation and the results are then displayed in desktop GIS which enables contour maps of access to be generated. The examples we use are for the Tate Gallery and for Wolverhampton.

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