The shape of habitable space

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Abstract
How is it that a representation of the state of a system – such as the axial map – can explain dynamic behaviour such as movement flows? This paper investigates the relationship between spatial configuration and behaviours that take place in time – specifically, movement. A method is presented for incorporating time systematically in a representation of spatial configuration. This is based on assuming a universal maximum walking speed for pedestrians, and it is shown that the resulting three dimensional mapping of space-time can be constructed from sections of the surface of cones. Properties of this representation are investigated and first it is shown that a uniform grid results in an approximately flat surface in space-time. All the main forms of deformation of the urban grid are found to result in 'warping' the space-time surface of the uniform grid into valleys and ridges. A method is proposed for summing space-time surfaces constructed from all root locations. Finally, the implications for space syntax theory and methodology of the space-time representation are discussed. It is concluded that one of the properties of the conventional axial map is that it internalises aspects of the temporal domain within its construction, and this may account for its explanatory success.

Keywords
space, time, experience

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