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Guest editorial

Visibility analysis

I think we have been very fortunate in this theme issue on visibility analysis in bringing together the work of some of the key researchers from all over the world. Generally, despite our desire to assimilate works from many disciplines it is just not possible to cover the entire field because of lack of time, resources, and insight. Mike Batty and I are obviously quite pleased to see this theme issue because it was born out of a brief conversation during a flight.

It is easy to break down the urban built and natural environments into the two basic observable aspects of space: the *objects* (for example, buildings, terrain) and the *void* (open space) between the objects. Most visibility researchers in the social sciences are interested in understanding the impact of built structures on the aesthetics of space, their usability, and our general behaviour around built structures. In other words, the assumption is that built structures influence human behaviour. But the computation of the influence of built structure shapes on a large scale involves a rather daunting morphometric analysis. Hence, as a simplification it is assumed that morphometric analyses of open spaces will somehow act as a mirror and yet a positive analogy for the properties of the underlying built structures. On the surface, this appears to be only a difference of semantics but only a deeper analysis will reveal the effects of these approximations.

Bishop's paper on the visual impact of objects (for example, wind turbines) on the perception of landscape aesthetics takes on the challenge of quantifying the direct visual influence of built structures on humans. Bishop models the visual impact of these objects, using a combination of formal colour-contrast-decay equations and empirical experiments on the visual dominance of object sizes. But there is more to visual impact than mere visualisation. Recently the UK news media reported that the local residents around an onshore wind farm in England found the wind turbines annoying eyesores, especially when the wind turbines made loud noises (BBC, 2003). This suggests that quite often visibility analyses may also have a social aspect based on the observation that the arrangement and properties of built structures (sound, colour, etc) around us control our behaviour.

The panopticon prison designed by English philosopher Jeremy Bentham (1748 – 1832) is an excellent example of an exploitation of the relationship between visibility and built structure shape. Panopticon prisons are circular, with the cells built into the inside curve of the circle, facing inwards, and the guard tower positioned in the middle of the circle. The prisoners can see neither each other nor the prison guards. The concept of the panopticon prison is to let prisoners feel that they are being watched constantly and thus behave accordingly.

In the same spirit, papers by Turner, by Desyllas, Connoly, and Hebbert, and by Lake and Woodman discuss the different modern applications of the relevance of visibility analyses to our cognition. But just like Ervin and Steinitz, I would like to believe that, though vision might be one of our key sensory mechanisms, we are not literally *driven* by it. Sound, smell, aesthetics, and perhaps sometimes the *sixth sense* also prepare us to make geographic decisions, such as selecting a parking spot for our cars in the night.

Enthusiasm for automated visibility analyses has grown significantly over the years because of marked improvements in hardware and software algorithms. The papers by Bittner and Wonka, and by De Floriani and Magillo explain the state of the art in the computation of visibility analyses. I think future advances in this field will eventually help solve the elusive visibility analyses in three-dimensional urban and natural environments (for example, see Fisher-Gewirtzman and Wagner, 2003; Snizek, 2003).

Finally, some readers may be puzzled to find here a paper on radiowave propagation modelling by Wagen and Rizk. Well, the paper is not for the Supermen amongst us nor am I suggesting in any way that humans have developed x-ray vision. However, I believe that, in the very near future, the words 'visible' or 'invisible' will lose their conventional meaning of being able to be seen by eye. These days, most of us carry a mobile phone, wireless networked palmtops, employers monitor our cyber communications by law, and soon we will have to carry smart tags or microchips (BBC, 2002) for remote identification by security systems (Batty, 2003). I wonder how this fits in with the notion of being visible and perhaps in the next decade we will instead focus on *electronic visibility*. If you have seen the film *Minority Report* you will know what I mean. The other and more practical purpose of the paper by Wagen and Rizk is to expose traditional readers of *Environment and Planning B* from urban planning to the field of radiowave propagation modelling. I believe that it could be a requirement in the planning and design of urban spaces to take radiowave friendly or unfriendly designs and materials into consideration as wireless networks begin to replace cable communications in all aspects of city function.

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