

VIRTUAL BEINGS

emergence of population level movement and stopping behaviour from individual rulesets

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0 Abstract

Space syntax research has found that patterns of pedestrian and vehicular movement are strongly correlated with the pattern of space in urban areas and inside buildings. These findings are based on observations of movement patterns of large numbers of people. However, the possible mechanisms at the individual level which might lead to such population level effects are not well understood.

This paper reports on ongoing research using VR technology to try to simulate “life-like” behaviour in a world of virtual beings. A variable field of view, collision detection and a sense of vision was given to the virtual beings. A number of “rule sets” were then used to try and mimic human behaviour characteristics including both probabilistic and learning algorithms. Research using simple rule sets for attraction surfaces imposed on a spatial configuration have been found to be problematic showing behaviours such as individuals becoming “stuck” at local minima in the surface. In this research complex rulesets involving the viewshed for each individual and awareness of other beings were tested.

The movement of each being around the world was tracked and a ‘trail’ was produced which was then compared both to the trails produced by real experimental subjects moving around the same world using an immersive VR headset and to the syntactic properties of the world itself. This comparison is allowing us to specify plausible cognitive models for individual behaviour that might give rise to the collective patterns observed in conventional syntax research.

keywords: movements, urban space, virtual environment, behaviour, simulation

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