

Using Software Agents to Simulate the Use of Geographic Spaces

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Urbanists and landscape architects can use several drawing tools and software in order to create 2D or 3D spaces. However, such software cannot offer advice to designers with respect to the organization of space, to the evaluation of the design's quality and indications about how the proposed space organization could be experienced by users. In order to help a designer to assess the quality of her design, we propose to simulate how the geographic space could be used by its future users (mainly navigation and occupation of space) and to display on screen the usage patterns obtained thanks to the simulation. As a case study we work on urban and semi-urban parks.

To this end, we developed a simulation tool composed of software agents which have different profiles (i.e. teenagers, woman with young children, lovers, families, old people) and are able to explore the park space according to the behaviors which are typical of their profiles. Agents appear in and disappear from the simulated space according to scenarios specifying which categories of users arrive in or depart from the park during a typical day. Agents are attracted by points of interest which fit with their profiles (i.e. playgrounds for children, rest areas for old people, pick-nick areas for hungry people, etc.). They can avoid obstacles and follow paths or decide to go through open spaces (lawns, meadows, etc.) taking into account the difficulty of navigating in these spaces with respect to the agent profile (old persons do not climb steep slopes, while adventurous children love that).

The system enables the designer to observe the simulation and study different patterns (most-often used paths, agglomeration of several agents in certain areas, importance of the flow on various paths, etc.). Our system allows the calculation and display in real time of the trajectories of several hundreds of agents on a 2D map, each agent being presented by a colored dot.

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Presentation: We would like to present **a poster and a demonstration.**