University of Washington

Abstract

Mouse.class

The Experiments for Exploring Dynamic Behaviors in Urban Places

by Preechaya Therakomen

Chairman of the Supervisory Committee:
Professor Mark D. Gross
Department of Architecture

Urban space comprises not only physical forms - buildings, streets, plazas, trees, etc. – but also the people 'acting on them'. The purpose of this thesis is to increase our awareness of behavior and environment relationships, focusing on local movement at the individual level in a pedestrian environment. The thesis describes the experiment Mouse.class, as a concept demonstration model, which allows users to create a 2D-virtual environment for accommodating autonomous agents, Mouse, to explore (pedestrian) dynamic behavior in relation to (urban) space.

The program uses multi-agent technology to construct an individual-based simulation in which each agent employs individual behaviors. The agents have abilities to navigate through the environment using a behavior rule set derived from a wide range of research – both theoretical and empirical approaches – on spatial behavior in small-scale urban space. These simulated individuals also have the ability to improvise their actions according to the situations they find themselves in. In the simulation, each agent reacts to the space configuration, to specific attractions in the environment, as well as to other mice. The local movement of an individual is, therefore, the result of the interaction of its visual perception, motivation, and social actions. The program then tracks each movement – path of use – revealing patterns that emerge from interactions among the components of the environment.

The exploration seeks to develop a way urban designers think of 'space' as fluid processes and recognize that objects in the urban environment can have radically differing effects, depending on the circumstances and contexts in which they exist. Indeed, people are parts of the environment.