VGE-A New Communication Platform for the General Public

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Extensive Abstract

The Internet and the World Wide Web enable the public convenient access to geographic data, to easily implement spatial data analyses, to conduct model simulation and visualization, and to participate in resource management, environmental protection, regional planning and decision making.

In this paper, we introduce the concept of VGEs. VGEs are environments pertaining to the relationship between post-humans and 3-D virtual worlds. Post-humans are defined as a combination of humans in the real world with 3-D avatars in 3-D virtual worlds. VGE can be a platform for the public participation in spatial data analyses, in model computation and simulation, and in environmental planning and decision making. Three cases are presented for the public participation in terms of human-data, human-model, and human-human relationships. The first case is to study the web-based public participation in visual impact assessment of urban landscape through the application of spatial data analytical functions, especially the viewshed analysis, of distributed Arc/View GIS (see Figure 1). The second case focuses on the public participation in an ecological planning via a wildfire model-driven virtual studio on the Internet (see Figure 2a-2b). The last case is to discuss the communication and interaction among distributed multiple users in a 3D virtual shared space over the Internet via the experiment of a VRML/Java based virtual environment for the country parks in Hong Kong (see Figure 3).

Throughout the design, development, and applications of three system prototypes, we explore the key techniques to the integration of online-GIS, model geo-computation, 3D visualization, and distributed virtual environments for the public participation. We believe that the distributed, multi-user, geographic model-driven 3D virtual geographic environments are powerful platforms for the general public participation in urban and ecological planning and decision-making, and in supporting regional sustainable development across the Internet.
Figure 1. The interface of the prototype system for visual impact assessment

Figure 2a. Forest fire simulation runtime environment parameters initializing page.
Figure 2b. Forest fire simulation result map displaying and feature query interface.

Figure 3. A distributed, 3-D, multi-user virtual environment, VirtualPark

Main References


