

Modeling visibility through visual landmarks in 3D navigation using geo-DBMS

Abstract:

Today's map navigation systems (from 2D to 3D) provide direction instructions in the form of maps, pictograms, and spoken language. However, they are so far not able to support or has very limited access to landmark-based navigation, which the most natural navigation concept is for humans and which also plays an important role for upcoming personal navigation systems. In order to provide such navigation, in this paper, we discuss one of possible solution of modeling visibility in 3D navigation through visual landmarks using Geo-DBMS approach. The aim is to generate measurable visual landmarks along the focus map in a city model which can be used in car or pedestrian navigation system (as web or mobile application). The focus map is obtained from 3D analytical operation (3D buffering from the 3D shortest path analysis result) function within Geo-DBMS. Detailing to the generated measurable visual landmark's façade, an implementation of dynamic pulse function is then applied. The techniques for choosing specific landmarks and generating the focus maps are shortly presented and their functionality is explained. We tested the proposed approach by using Stuttgart 3D city model. Finally, the paper provides outlook on ideas for future deployment and research.