

3D Wiki for Virtual Urban Environments

MAP-i – PhD proposal

Background

The complex nature of urban environments is prone to be studied by a diverse set of professionals: decision makers, urban planners, geographers, economists, architects, sociologists, etc. Most of this work is done by teams of professionals, who cooperate for the intended goal. Collaborative tools, such as Wikis have been developed to promote this kind of work, however, the geospatial nature of urban environments demands the use of geospatial tools, maps and/or 3D models for which these tools are not prepared.

A virtual urban environment is a 3D model that portrays with a good level of visual fidelity the urban reality, or that presents in a visual and intuitive mode, the data associated with it. Expeditious modelling of urban environments can be achieved by tools such as the XL3D modelling system [CBSF07] which is able to generate virtual urban environments from existing geospatial data, in a completely automatic mode, being able to regenerate the virtual environment from dynamically updated data sources.

Objectives

The main objective of this work is the development of a new concept of collaborative tool, based on a virtual urban environment that allows the collaboration of teams of professionals directly on the 3D model of the urban area.

The specific scientific/technological objectives are the following:

- To study the state of the art of urban environments, collaborative tools, 3D interaction and expeditious 3D modelling;
- To analyze the problem of collaborative work over urban environments and define a new framework based on 3D virtual environments;
- To develop and implement a tool that generates a virtual environment and provides interaction directly over the visual representation of the urban features (buildings, urban furniture, roads, etc) in order to manipulate data associated with it;
- To evaluate the validity of the framework created and the performance of the tool developed over a set of test cases involving professionals.

References

[CBSF07] A. Coelho, M. Bessa, A. Sousa, and F. Ferreira. Expeditious modeling of virtual urban environments with geospatial I-systems. In Computer Graphics Forum, number 4, volume 26, pp 769–782, 2007.

Supervisors

António Augusto de Sousa (DEI-FEUP/INESC Porto)

augusto.sousa@fe.up.pt

António Coelho (DEI-FEUP)

acoelho@fe.up.pt

Research Unit

DEI-FEUP – Faculdade de Engenharia da Universidade do Porto – Departamento de Informática