

Application of geotechnology to urban configuration

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Abstract

Remote sensing and the geoprocessing techniques constitute powerful tools to monitor the evolution of urban growth, to manipulate various sorts of data and to simulate models that help in developing urban plans. Satellite images will be used, because of their low cost, temporal resolution (time to acquire a new image of the same point) and spectral resolution (sensibility of sensor to capture data of small spectral band).

This work is an exercise in dealing with different sorts of data. This first one deals with areas according to environmental attributes, i.e. their natural characteristics. The aim here is to identify environmental restrictions for human occupation. Cross referencing of legislation and thematic data will be done by means of the technique of algebra of maps emphasising Boolean operations.

The second sort of data refers to areas which have already been occupied. The aim is to reach a diagnosis of such occupation, by way of the analysis of the suitability or otherwise of the human uses found here. The main innovation here, concerning the first and the second sort of data, is the use of neural networks for classification of satellite images. This new method uses a sampling system that does not require a definite metric of statistical distribution of parametric data, nor previous knowledge of this distribution.

The third sort of data refers to urban form variables: Integration Measure and Dispersion Index. The first computes the relative accessibility of each urban axis in relation to all other axes in the system; the second indicates distances inhabitants have to travel between home and the Central Business District (CBD). Finally, geoprocessing tools are used to bring together all types of information.

Keywords

Urban zoning,
urban syntax,
geoprocessing,
neural networks.

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