

The Vectorial Segmentation of Buildings in Vila Cafezal Informal Settlement Aimed at 3D Cadastre Creation

Plinio TEMBA, Brazil

Key words: Irregular Settlements, LiDAR, 3D Technical Cadastre, DSM

SUMMARY

The informal settlement is a degraded public or private owned area of a particular city characterized by substandard housing, lack of infrastructure and without land tenure regularization. It is a characteristic of urban settlement that emerged in the early twentieth century, a consequence of the process of uneven economic development between the south-southeast regions in contrast to the north and northeast regions, stemming from failed policies of the Brazilian government. There's finding that the explosion that occurred in the housing deficit in the second half of the 1950s is the result of rural migration due to the expansion of industrial units installed most notably in the outskirts of large cities, and mainly due to the government's inability to formulate public policies compatible to the dwellings demand. Roughly, informal settlements are located in areas neglected by the land market agents. In other words, they are devalued either by their location, environmental quality, and levels of slope or geological problems areas. The cadastre of regular urbanized regions' plots with the local government of both medium and large cities of Brazil count on strategies for updating / expansion of technical registry that approximate 3D cadastre.

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1. INTRODUCTION

The informal settlement is a degraded public or private owned area of a particular city characterized by substandard housing, lack of infrastructure and without land tenure regularization. It is a characteristic of urban settlement that emerged in the early twentieth century, a consequence of the process of uneven economic development between the south-southeast regions in contrast to the north and northeast regions, stemming from failed policies of the Brazilian government. There's finding that the explosion that occurred in the housing deficit in the second half of the 1950s is the result of rural migration due to the expansion of industrial units installed most notably in the outskirts of large cities, and mainly due to the government's inability to formulate public policies compatible to the dwellings demand. Roughly, informal settlements are located in areas neglected by the land market agents. In other words, they are devalued either by their location, environmental quality, and levels of slope or geological problems areas. The cadastre of regular urbanized regions' plots with the local government of both medium and large cities of Brazil count on strategies for updating / expansion of technical registry that approximate 3D cadastre.

However, the need for a continuous supply of resources at least rescue the legal record is left to the localities of informal settlements which house 25% of the population. The Law 11.124 of 2005 is an initiative of the government that induced the municipalities in partnership with the central government to build affordable housing for families that earn up to three minimum wages, which is estimated to about US\$290.00. The constructions inserted in the Government Social Program Minha Casa Minha Vida (MMV), when implanted in the settlements, impact a spatial planning with valuable accessories that adorn the houses. Examples are urban facilities (parks, multisport courts, education centers etc.) and access roads. If on one hand the technical registry is precarious, on the other it allows the experience of innovative processes that can be expanded to the localities in the city that count on regular registration of the plots. However, the strategy in the settlements is distinctive the plot is not registered and the building is the property boundaries.

This paper defines a technique for semi-automatic vectorization of buildings that rescue the edges and discretizes the housing unit in the informal settlement. Furthermore, the vector base of buildings is associated with the Relational Database (RDB). The Relational Database (RDB), in which data is stored in multiple tables, interrelated through codes or identifiers. These platforms provide greater speed and reliability in data maintenance, being, however, necessary to also store information about how tables are related. Combine different tables such as those of the plot in which the physical data and services or the proprietary table containing the personal data of the holder of rights to domain (or possessor) are recorded. Both tables are related by the proprietary code. The methodology is to rescue the building from a collection of images from Google Earth and identify with mathematical operators

(image filters) associated with the data obtained from the LASER profiling, which constitute the digital surface model (DSM). This relational database was developed in the QuantumGIS® (version 1.7.0) platform. The primitive graphic was the area. The Boolean operation adopted the identified and unidentified class. The expected results of this research on the use of 3D registration in the Cafezal settlement should be able to store, manipulate, query, analyze, update and view 3D cadastre objects and their associated land rights, restrictions and responsibilities.

Thus, institutional support in the form of regulations for 3D data acquisition, and the tasks of advertising the public and private sectors are considered crucial in understanding the 3D property rights, registration and representation of 3D properties. The study area is a polygon of 2.5 ha in the South Central Regional Municipality of Belo Horizonte / MG, Brazil.

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