

Automated Procedures for Creating and Updating Digital City Models Using High Resolution Imagery

Corresponding Author: Dr. George Vozikis

Co-Author: Prof. Dr. Josef Jansa

george.vozikis@geomet.gr Address: 6, Vyronos str. / GR - 15231 Halandri / Athens – Greece

Tel.: +30-210-6748540 Fax.: +30-210-6753780

Procedures for creating and updating Digital City Models have evolved significantly during the past years. New techniques allow a very high degree of automation. Though there still exist certain drawbacks, especially when dealing with high resolution satellite imagery. In this research 3 approaches for automated building and land parcel extraction are presented and analyzed in order to examine their potential for mapping tasks. The goal is to extract the geometric properties of individual buildings or land parcels in 3D. Input data are either stereo imagery, or mono images provided together with an additional elevation source. The first step deals with the identification of potential building or land parcel candidates. Once such regions of interest are automatically determined, the next step is to derive the geometric properties of these objects. The first discussed method is based on a chain of Hough transformations. The second method makes use of image matching methods and the third described approach focuses on feature extraction. These methods were tested and examined on imagery coming from various sources such as, e.g. remote sensing satellite sensors such as IKONOS, Quickbird and Orbview. The results of this investigation show that the use of advanced image processing methods can increase the degree of automation enormously, while human interaction is needed only for Quality Control purposes.