Volume XXXVIII-3/W22

Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXVIII-3/W22, 197-202, 2011
www.int-arch-photogramm-remote-sens-spatial-inf-sci.net/XXXVIII-3-W22/197/2011/
doi:10.5194/isprsarchives-XXXVIII-3-W22-197-2011
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STREET REGION DETECTION FROM NORMALIZED DIGITAL SURFACE MODEL AND LASER DATA INTENSITY IMAGE

T. S. G. Mendes[1] and A. P. Dal Poz[2]

[1]Cartographic Sciences Graduate Program, UNESP, São Paulo State University, Brazil
[2]Department of Cartography, UNESP, São Paulo State University, Brazil

Keywords: Street region detection, laser scanner data, normalized Digital Surface Model, intensity image, image processing techniques

Abstract. The urban road network extraction process can be simplified by firstly detecting regions corresponding to streets, allowing a substantial reduction of the search area. As a result, the extraction process is benefited in two aspects: the computational complexity and the reliability. This paper aims at detecting street regions using only data obtained by Laser Scanner Systems. A sequence of standard image processing techniques is used to process height and intensity laser scanner data. A normalized Digital Surface Model is derived from height laser scanner data, from which regions corresponding to aboveground objects (mainly trees and buildings) are detected. Next, detected tree regions are eliminated from the aboveground regions, remaining only buildings. Then, morphological operators are applied in order to obtain elongated street ribbons and homogeneous block regions. Street regions are also detected in the intensity image. The results obtained from the radiometric and geometric laser scanner data are combined, allowing the elimination of non-street regions and the improvement of the geometry of region boundaries. The experimental results showed that the methodology proved to be efficient to detect street regions.

Conference Paper (PDF, 2257 KB)

Citation: Mendes, T. S. G. and Dal Poz, A. P.: STREET REGION DETECTION FROM NORMALIZED DIGITAL SURFACE MODEL AND LASER DATA INTENSITY IMAGE, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XXXVIII-3/W22, 197-202, doi:10.5194/isprsarchives-XXXVIII-3-W22-197-2011, 2011.

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