ABSTRACT

Road networks play an important role in a number of geospatial applications, such as cartographic, infrastructure planning and traffic routing software. Automatic and semi-automatic road network extraction techniques have significantly increased the extraction rate of road networks. Automated processes still yield some erroneous and incomplete results and costly human intervention is still required to evaluate results and correct errors. With the aim of improving the accuracy of road extraction systems, three objectives are defined in this thesis: Firstly, the study seeks to develop a flexible automated road extraction system, capable of extracting roads from high resolution satellite imagery. The second objective is to integrate a variety of algorithms within the road network extraction system. The benefits of using each of these algorithms within the proposed road extraction system, is illustrated. Finally, a fully automated system is proposed by incorporating a number of the algorithms investigated throughout the thesis.

Keywords: automated road network extraction, remote sensing analysis, cartographic applications, feature extraction, edge detection, segmentation, classification, artificial neural network.
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