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Identification of High-Rise Buildings Using Object Based Classification and Shadow Extraction Techniques

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Abstract : Digitization of urban features is a tedious and time-consuming process when done manually. In addition to this problem, Indian cities have complex habitat patterns and convoluted clustering patterns, which make it even more difficult to map features. This paper makes an attempt to classify urban objects in the satellite image using object-oriented classification techniques in which various classes such as vegetation, water bodies, buildings, and shadows adjacent to the buildings were mapped semi-automatically. Building layer obtained as a result of object-oriented classification along with already available building layers was used. The main focus, however, lay in the extraction of high-rise buildings using spatial technology, digital image processing, and modeling, which would otherwise be a very difficult task to carry out manually. Results indicated a considerable rise in the total number of buildings in the city. High-rise buildings were successfully mapped using satellite imagery, spatial technology along with logical reasoning and mathematical considerations. The results clearly depict the ability of Remote Sensing and GIS to solve complex problems in urban scenarios like studying urban sprawl and identification of more complex features in an urban area like high-rise buildings and multi-dwelling units. Object-Oriented Technique has been proven to be effective and has yielded an overall efficiency of 80 percent in the classification of high-rise buildings.

Keywords : object oriented classification, shadow extraction, high-rise buildings, satellite imagery, spatial technology
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