Automatic Extraction of Buildings Boundaries Using Satellite Imagery with High Spatial Resolution and Deep Learning Methods

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Key words: Affordable housing; Bridge surveying; Cadastre; Capacity building; Cartography; Cost management; Education; Engineering survey; Geoinformation/GI; GNSS/GPS; Land management; Laser scanning; Low cost technology; Photogrammetry; Positioning; Quantity surveying; Real estate development; Remote sensing; Spatial planning; Urban renewal; Valuation; Young surveyor; Remote sensing, Deep Learning, Building extraction, Active Contour, World view-2 satellite, Snake model

SUMMARY

In recent years, Rural and urban spatial information are becoming one of the most crucial tools in applications like developing new databases and maintaining the ones that already exist, among other things.

One of the most significant elements in both rural and urban regions is the building. Building detection, which involves identifying each building's location within the data set being used, and building reconstruction, which entails reconstructing each building's two- or three-dimensional geometric model, are the two main sections that create the procedure of extracting buildings from the images.

To extract significant features, such as a building, innovative and effective techniques for image processing (active contour models) must be adopted and developed. In the current study, the border of the building was extracted from an image of Shahru in the province of Hormozgan, IRAN utilizing data from the Worldview-2 satellite.

The Margon model was implemented in the MATLAB programming environment to identify the main components of the structure after pre-processing the image and utilizing the maximum likelihood classification method.

The output of the proposed methodology was contrasted with the manually generated map in the ArcGIS environment to assess the results.

The results indicate a 90% overall accuracy

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