Roof Segmentation Using True-Orthoimage and DSM with OBIA Paradigm

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Abstract:
Currently analyzing high-spatial resolution image data to classify the object is one of the most important research topics. Conventional stereo-plotting method that use manual object delineation will take a long time in the process. Therefore, a more effective approach is needed to overcome it. Object Based Image Analysis (OBIA) is the solution offered to facilitate the identification of objects by considering the shape, size, area, and information contained in the objects. In this study, we use true-orthoimage and DSM (Digital Surface Model), generated by (Unmanned Aerial Vehicle) UAV images, with 0.05-meter spatial resolution as the base data to get the segmentation results from the roof of the building. In which, DSM is used to obtain height information for each object. Moreover, DSM data is used to get the slope of the roof to separate different roof planes of the same building. And then, the segmentation process is done on the roof of the building based on the aspect of the roof of the building. Segmentation of the object is done by multi-resolution segmentation technique by considering the parameters of scale, shape and compactness to get maximum accurate result in each building. This approach is applied to identify the roof of the building at the sea shore villages of Tainan, Taiwan with an area of 200 x 200 square-meters. Finally, the result of segmentation is compared with the manually delineation result for accuracy assessment.

Keywords: OBIA, True-orthoimage, DSM, Segmentation,