

Roof and Road Network Detection through Object Oriented SVM Approach Using Low Density LiDAR and Optical Imagery in Misamis Oriental, Philippines

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Abstract : The advances of aerial laser scanning in the Philippines has open-up entire fields of research in remote sensing and machine vision aspire to provide accurate timely information for the government and the public. Rapid mapping of polygonal roads and roof boundaries is one of its utilization offering application to disaster risk reduction, mitigation and development. The study uses low density LiDAR data and high resolution aerial imagery through object-oriented approach considering the theoretical concept of data analysis subjected to machine learning algorithm in minimizing the constraints of feature extraction. Since separating one class from another in distinct regions of a multi-dimensional feature-space, non-trivial computing for fitting distribution were implemented to formulate the learned ideal hyperplane. Generating customized hybrid feature which were then used in improving the classifier findings. Supplemental algorithms for filtering and reshaping object features are develop in the rule set for enhancing the final product. Several advantages in terms of simplicity, applicability, and process transferability is noticeable in the methodology. The algorithm was tested in the different random locations of Misamis Oriental province in the Philippines demonstrating robust performance in the overall accuracy with greater than 89% and potential to semi-automation. The extracted results will become a vital requirement for decision makers, urban planners and even the commercial sector in various assessment processes.

Keywords : feature extraction, machine learning, OBIA, remote sensing

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