Intergrating Uav and Multispectral Remote Sensing for Topographic Mapping and Land Cover

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Key words: Photogrammetry; Remore sensing; mapping; classification

SUMMARY

Integrating UAV and Multispectral Remote Sensing for Topographic Mapping and Land Cover.

Abstract

This research explores the integration of Unmanned Aerial Vehicle (UAV) photogrammetry and multispectral remote sensing to improve topographic mapping and land cover analysis. The main objective is to assess how combining high-resolution UAV-derived imagery with multispectral satellite data can enhance spatial accuracy and classification reliability. The methodology involves capturing UAV images using a calibrated drone equipped with a high-resolution camera, processing these images through Structure from Motion (SfM) and Multi-View Stereo (MVS) techniques to generate detailed 3D terrain models. Concurrently, multispectral satellite images are processed with supervised classification algorithms to identify various land cover types. The study finds that the integrated approach significantly improves the precision of topographic maps and land cover classification compared to single-source methods. These results demonstrate the potential for more accurate, efficient, and cost-effective environmental and land management practices. The findings highlight the rate of combining UAV and multispectral remote sensing data for comprehensive spatial analysis, with broad implications for sustainable planning, resource monitoring, and environmental conservation.

Keywords; Remote Sensing, Mapping, Environmental Conservation, Multispectral, Classification

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