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Comparing Aerial Photogrammetry with UAV-LIDAR in High Vegetation Rural Areas

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Extended Abstract

Unmanned aerial vehicle (UAV) technologies are developing at a rapid pace, which has brought about a new era of geospatial data collecting. This includes improvements in the accuracy and productivity of tasks related to surveying and mapping in a variety of contexts. UAVs outfitted with cutting-edge sensors like Light Detection and Ranging (LiDAR) and high-resolution cameras for photogrammetry have proven to be game changers in rural areas, where traditional ground-based surveying methods frequently face significant logistical challenges due to difficult terrain and vast expanses [1].

In this field, UAV-LiDAR and aerial photogrammetry are two of the most well-known technologies. Each has unique advantages and approaches, which makes them appropriate for various kinds of rural surveying tasks. UAV-LiDAR measures distances to the earth's surface by producing laser pulses from a sensor.

However, aerial photogrammetry uses UAV-mounted cameras to take high-resolution pictures. Photogrammetric techniques are applied to these photos to produce orthomosaics and 3D models.

It is essential to compare these two methods in order to decide which is best for certain rural mapping work. The variety of landscapes seen in rural areas, from forested areas and pastures to agricultural fields and mountains, creates special difficulties for reliable data collecting and interpretation. Various considerations, like the type of terrain, the presence of vegetation, the needed data precision, and the project's budget limits, influence the decision between UAV-LiDAR and aerial photogrammetry [2].

The aim of this research is to present a thorough comparison between aerial photogrammetry and UAV-LiDAR in rural areas, with an emphasis on the advantages, disadvantages, and real-world uses of each technology.

The high-density point clouds and precise Digital Elevation Models (DEMs) that UAV-LiDAR can generate are especially useful in rugged and wooded areas where traditional photogrammetry could be ineffective. On the other hand, aerial photogrammetry is superior at producing high-resolution orthomosaics, which are crucial for infrastructure development, landscape design, and agricultural monitoring [3].

Moreover, combining aerial photogrammetry with UAV-LiDAR provides a hybrid strategy that benefits from the best features of both technologies. This integrated approach is a potent tool for managing rural areas since it may offer thorough geographical information. In order to provide clear criteria for choosing the right technology based on project requirements, this study looks at the actual results of utilizing aerial photogrammetry, UAV-LiDAR, and their integration [4].

To sum up, the comparison between aerial photogrammetry and UAV-LiDAR in rural areas highlights the revolutionary possibilities of UAV-based geospatial data collection. In the end, it helps to the sustainable management of rural landscapes by promoting more informed decision-making in the areas of infrastructure development, agricultural planning, and environmental monitoring [5].

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