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Lidar remote sensing

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Commentary Article

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1. INTRODUCTION

Lidar is a remote sensing technology which uses electromagnetic energy in the optical range to detect an object that measures distance by illuminating a target with a laser and analyzing the reflected light

Lidar is popularly used as a technology to make high-resolution maps, in Geomatics, Archaeology, Geography, Geology, Geomorphology, Seismology, Forestry, Remote sensing, Atmospheric physics, Airborne laser swath mapping , Laser altimetry, and Contour mapping.[1-6]

1.1 Applications: Agriculture, Autonomous vehicles Biology and conservation, Geology and soil science, Atmospheric remote sensing ,meteorology, Military, Mining, Physics and astronomy, Robotics Spaceflight, Surveying, Transport, Wind farm optimization ,Solar photovoltaic deployment optimization.[7-20]

2. DISCUSSION

- **LiDAR Data for Characterizing Linear and Planar Geomorphic Markers in Tectonic Geomorphology** : The communications between tectonic movement, erosion and sedimentation can alter linear geomorphic features, cases of linear geomorphic markers -Offset channels connected with strike-slip faults it can be utilized to focus the rate and nature of tectonic movement. Planar geomorphic features, for example, fluvial terraces, alluvial fans, and marine terraces utilized as geomorphic markers as a part of tectonic disfigurement studies.[21-25]

  Airborne and terrestrial LiDAR for portraying linear and planar geomorphic markers, incorporating dynamic faults in urban and forest environments and deformation caused by seismic tremors.

- **Automatic extraction of 3D objects from LIDAR data:** LIDAR information has interesting properties for programmed extraction of 3-D objects. The most critical and invariant property of a 3-D protest in LIDAR information is 3-D. As it were, the very accessibility of Z distinguishes objects better than the 2-D image view. This property is utilized to distinguish, extract, and label 3-D objects automatically.[26-30]

- **Estimation of Above-Ground Forest Biomass using Lidar:** Airborne scanning LiDAR is a system for productive and precise biomass mapping because of its ability for direct estimation of the three-dimensional structure of vegetation. The estimation of above ground biomass in forests is critical for carbon cycle modeling and climate change alleviation programs. Little footprint lidar gives exact biomass estimates, however its application in tropical forests has been constrained, Hyper spectral data record canopy spectral information that is possibly identified with forest biomass. [31-39]
- **Light Detection and Ranging using LiDAR:** Recognized as an effective and Economic strategy for collecting different sorts of roadway resource data. LIDAR Light Detection and Ranging is a remote sensing innovation that gathers 3-dimensional point clouds of the Earth's surface and is utilized for an extensive variety of uses including high- resolution topographic mapping and 3-dimensional surface modeling and also infrastructure and biomass studies.[40-45]
- **Development and Flight Test of an Avionics Lidar for Helicopter:** The sensors incorporate a 3-Dimensional Imaging Flash Lidar, a Doppler Lidar, and a Laser Altimeter. The Flash Lidar can produce terrain elevation maps that demonstrate dangerous highlights, for example, rocks, craters, and slopes. The Doppler Lidar gives exceptionally precise vector speed and elevation information taking into account accuracy route to landing sites. The Laser Altimeter gives extremely precise ground relative elevation estimations from more than 20 km. The lidars worked in conjunction with other ALHAT landing subsystems (Guidance Navigation & Control, peril recognition/safe site determination figure component, and so forth.) as a coordinated framework [46-48]
- **Automatic Segmentation of Lidar Data:** Programmed extraction of building rooftops from remote sensing information is imperative for some applications, including 3D city modelling.[49-55]

3. CONCLUSION

Lidar remote sensing has become available as a research tool and precise apparatus for measuring topography, vegetation height, and in addition more intricate characteristics of canopy structure and function. Lidar has many applications in the scientific, engineering, and military fields. Lidar sensors have been deployed at fixed terrestrial stations, in portable surface and subsurface vehicles, lighter-than-air craft's, settled and rotating wing flying machine, satellites, interplanetary probes, and planetary Landers and meanderers.

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