Research on Rapid Vegetation Extraction Based on UAV image in Desert and Gobi Area

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Abstract: In this study, high-resolution uav platform and motion structure modeling technology were used to research. Based on uav-image, vegetation coverage was automatically estimated by decision tree algorithm, and superimposed with DEM data to analyze the spatial distribution characteristics of vegetation in gobi region and its relationship with terrain. The results show that, based on the high definition image of UAV, the uav high precision image analysis platform is used to extract the sparse vegetation coverage in the Gobi region, and good accuracy is obtained. The use of uav image data has a good applicability for analyzing the sparse vegetation distribution characteristics in the Gobi region.

1. Introduction
The Gobi region is a desert ecosystem with extremely harsh natural environment. Under special geographical environment, plants gradually adapt to the harsh environment through long-term natural selection and form a special plant community composition. Compared with other ecosystems, these species are the most precious genetic resources. The research on the spatial distribution characteristics of vegetation and its main influencing factors in the Gobi region is of great significance to the scientific understanding of the features and functions of the ecosystem in the Gobi region, and can play a guiding role in the protection of local biodiversity.

The vegetation in the Gobi region is dominated by shrubs and semi-shrubs, which are generally extremely sparse and some of the ground is completely bare. The total vegetation coverage in most areas is less than 1%. There is a problem of too low accuracy in the extraction of vegetation information in such areas by using satellite remote sensing images. Although the ground vegetation survey can accurately obtain the functional and structural information of individual plants, it is difficult to observe the ground plants in large areas due to the harsh environment and human constraints in the Gobi region. In order to accurately obtain the vegetation distribution pattern information in the Gobi region, new means and methods must be adopted.

Materials and Methodology

2. Study area
This project is around Beijing to urumqi national highway MingShui paragraph. New territories to hami project all located in hami district, xinjiang uygur autonomous region with, project starting point at the crossroads of xinjiang and gansu MingShui, near the end into the G30 line, total length of 178.8 km, the main body direction from west to east, is located in east longitude 94 ° 09' ~ 96 ° 09', north latitude 42 ° 01' ~ 43 ° 16'.
3. Data collection

DEM

The mountain is mainly of the type of high mountains, distributed in the northwest of the project area, with an altitude of more than 3000m. The distribution of glaciers is relatively small, with a north-west-south extension. It is dominated by steep mountain peaks and steep mountain slopes. Karlick Shandong extension of the Omoltagh mountain for the low and medium mountains, low hills. The peak is round and slightly spreading to the northeast, with a general altitude of 1200–2000m. The highest peak, Ormtuag, is 2263m above sea level, with a relative height of 100–200m.
4. Result and Discussion
Sparse vegetation distribution due to the gobi area, bad environment, compared with satellite imagery, to obtain high spatial resolution image more accurately, based on the unmanned aerial vehicle (uav) image of the gobi area of vegetation spatial distribution characteristics and the main influence factors, research effort the sparse vegetation of the extraction of the gobi area, the study of the gobi area vegetation distribution pattern is of great significance. Patch vegetation is a common landscape type in arid and semi-arid regions.
It is mainly composed of bare patches and vegetation patches. The common patch types include strip, dot and ring patches. The patches of vegetation in the study area were in accordance with the previous research results. The study analyzed the vegetation coverage of three UAV sample sites located at the top, middle and edge of the diluvial fan, and found that the vegetation coverage of the study area decreased with the decrease of altitude, indicating that the change of altitude gradient on the whole diluvial fan scale was a dominant factor affecting the vegetation coverage. Previous studies have shown that elevation can indirectly regulate the distribution of plant species by influencing soil properties such as the redistribution of soil moisture, soil nutrients, and soil particle composition.

5. Conclusion
Based on the sample in the study area, the authors use UAV high-definition images of the gobi desert vegetation. The space distribution features and its relationship with the terrain, is based on the UAV high-definition images.

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