Research of Ecological Landscape Assessment System Based on UAV

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Abstract: This paper is taking the Baise-Leye and Molin highway as the study area, using UAV technique to investigate the eco-environment. With the advancement of computer technology, especially the development of remote sensing technology, the paper is using the UAV technique in the field of highway engineering will be more profound. The authors are taking the UAV image to extract model. The authors carry out highway environment simulation analysis.

1. Introduction
Based on real terrain and road data, this study studied the scale of large-scale highway scenes. The authors studied a framework model for quickly constructing the highway visual simulation system, based on the Baise-Leye highway.

2. Data analysis
Terrain generation in 3D scenes includes both the generation of terrain model data and the rendering of terrain. Such as mentioned above, the terrain model selected in this paper is a grid model, and the highway visual simulation is mainly aimed at the real world. Highways generally have real terrain data. Therefore, this study mainly uses the real land shape data generates terrain grid data, and texture mapping and rendering of grid data in 3D simulation field generating terrain in the landscape.
The monitoring process and methods of UAV for expressway slag dump are as follows: First, according to the main monitoring index system of expressway slag dump, the monitoring indexes and contents of UAV are selected. Then, according to the monitoring indicators and contents of the UAV, the operation process and scheme are designed, including three steps of data acquisition in the field, data processing in the field and monitoring information extraction. Then it is verified and applied in the construction of expressway.

### 3. Result and discussion

Unmanned aerial vehicle monitoring index and content of waste dump site. The main monitoring indexes of the waste dump site during the construction period of the expressway include the characteristics of the waste dump site, the type of the waste dump site, the composition of the waste material, whether it is stacked layer by layer, soil and water conservation measures, soil and water loss hazards, etc., as shown in Table 1. Among them, the two indexes of the material composition of the slag dump and whether it is stacked in layers should be carried out through field investigation, and the four indexes of the characteristics of the slag dump, the type of the slag dump, the water and soil conservation measures, and the harm of soil and water loss can be monitored by UAV.

Among the four monitoring indicators of UAV, the type of waste dump site can be determined by one monitoring, and generally does not change during road construction. The characteristics of the dumping site, soil and water conservation measures and soil erosion hazard monitoring should be carried out throughout the construction period of the expressway, and dynamic supervision should be carried out through periodic monitoring.
For gully (valley) type and slope type waste dump sites, due to the surrounding terrain shielding, navigation conditions are relatively complex, generally not suitable for automatic route planning, in this case, manually operated flight mode is more suitable. When filming abandon slag field the main body, according to the size of the scope of abandon slag field, the drones close up to the appropriate distance, rotate the camera hereunder at appropriate site, from the head or the tail began to abandon slag field, through the way of translational flight take photographs, degree of overlap between adjacent images of no less than 30% (production of DOM and DEM) or 60% (making 3 d model). If the single photo cannot cover the scope of the slag waste site, it is necessary to adjust the head Angle and take several photos with overlapping degree continuously to ensure the integrity of the shooting. The shooting Angle (SA) should be between 20° and 70°, and the included Angle (PA) between two adjacent photos should not exceed 30° at most. In addition, if it is necessary to express the relative relationship between the waste dump site and the main road, photos of the main road near the waste dump site should also be taken. There should be obvious overlap between the waste dump site and the main road, and the shooting Angle and height should be as smooth as possible to facilitate subsequent unified data processing. When necessary, they may also conduct key shooting and video recording to provide materials for supervision, law enforcement and evidence collection.

The mulin Expressway Busliu Mountain slag dump site is located in Linxiang District, Lincang City, with the main line heading to the left bank of the upper reaches of the Lancang River. It is designed to cover an area of about 84.56 mu (including 34.87 mu expanded area), with a length of about 260 m and an average width of about 88 m. After the location of the bar is changed, the total designed slag dump capacity is about 600,000 m3. As the waste dump site is close to the main stream of Lancang River, it is a typical ecological functional area and environmental sensitive area, so it is of great significance to conduct dynamic monitoring on it. In June 2019, the project team went to the site for uav aerial photography, and established a complete DOM, DEM and 3D model of the waste dump site.
Fig.3, DEM of study area.

4. Conclusion
Highway remote sensing and UAV in auxiliary route design, highway landscape design and highway engineering file management has broad application prospects. With the advancement of computer technology, especially the development of remote sensing technology, the influence of road remote sensing in the field of highway engineering will be more profound.

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