Virtual simulation teaching application of mine intelligent supervision based on UAV real scene 3D

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二. 成果简介：

In this project, the ultra-clear panoramic mine image of 100-million-pixel UAV, the three-dimensional mine model of UAV and the sub-meter level high-resolution remote sensing data of the province are refined and digitized. Based on open source WebGIS, the collection and processing of three-dimensional mining data of real scene and the intelligent supervision of mine are integrated in a full chain orderly. Through the virtual simulation experiment, the students can complete the large-scale comprehensive training of hot technology in a short time, which provides comprehensive practical training experiment matching for the application of new surveying and mapping technology and the talent training of modern management of natural resources.

三. 主要研究内容及创新点：

With the real 3D model of UAV as the digital base plate, based on the open source WebGIS component development, the real 3D mining data volume accumulated by the production project and the operation series function of the fine hardware and software are integrated orderly in the whole chain according to the tasks of data collection, processing, analysis and project management under the mining wisdom supervision. It provides an online experimental platform for experimental, task-driven and cooperative learning methods. It solves the problem of scattered and remote distribution of mines, the inconvenience of going back and forth, the complex scene and the hidden danger of safety, which bring huge teaching problems to the real experiment, and realizes the integration of production and education.

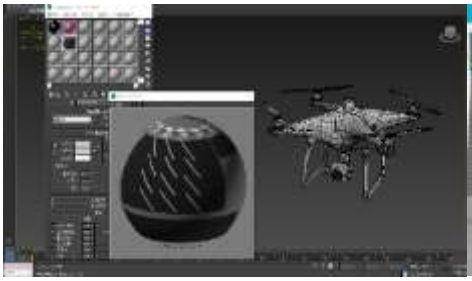


Fig.1. UAV 3D model construction.



Fig.2. Route planning renderings.



Fig.3. Cooperative Drawing task

四. 主要研究成果及应用情况

1.以通讯作者的身份投稿的论文《Design and Implementation of Virtual Simulation Experiment System for Acquisition and Production of UAV Real-scene 3D Data》已被录用（EI 检索号：20220811695809），《Construction and Application of the Dynamic Supervision System for the Mining of Mineral Resources》已被录用（EI 检索号：20214311057338）；论文《Based on Unmanned Aerial Vehicle Real-scene 3D Design and Implementation of Virtual Simulation Experiment System for Mine Smart Supervision in Large-scale Application》已被录用（EI 检索号：20221611985128）；论文《Design and development of a highly integrated three-dimensional teaching material for mining based on live drone》已被录用（EI 检索号：20221611985073）。

2.项目相关成果获第八届福建省“互联网+”大学生创新创业大赛**银奖**，第十二届“挑战杯”福建省大学生创业计划竞赛**银奖**，第五届“北斗+”创新创业大赛高校组**优秀奖（全国十强）**，2022 年厦门高校大学生创新创业大赛**三等奖**。

3.项目研究成果已在厦门理工学院、龙岩学院等多个高校运行应用，取得良好的教学示范效果。

4.申请软件著作权 4 项。

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