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Satellite Images Classification By Using Artificial Intelligence Techniques

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ABSTRACT: Satellite imagery plays a vital role in various fields, including agriculture, urban planning, disaster management, and environmental monitoring. Efficient and accurate classification of satellite images is essential for extracting valuable information and making informed decisions. In this study, we propose the use of artificial intelligence techniques for satellite image classification. A comprehensive dataset of labelled satellite images is collected,representing different land cover types or objects of interest. The dataset is pre-processed to enhance the image quality, remove noise, and normalize the data. Data augmentation techniques such as rotation, scaling, and flipping are applied to increase the dataset size and improve the model's generalization ability. Future research directions may include exploring advanced deep learning architectures, such as attention mechanisms or graph neural networks, to further improve the classification performance. Additionally, the integration of multi-sensorsatellite data and temporal analysis can enhance the capabilities of the classification models for dynamic monitoring and change detection applications.

INTRODUCTION The receive antenna gain is needed to accurately calibrate the normalized bi-statistic radar cross section measured by the BF-1 mission, which is a global navigation satellite system reflectometry (GNSS-R) constellation of two microsatellites and the first Chinese GNSS-R satellite mission. The instability of the satellite platform is the main cause of receive antenna gain errors. To obtain a high precision gain value, a calibration method that remaps the ocean surface detection location to the receive antenna pattern using satellite platform attitude measurements is proposed in this article. Thirty-two orbits of delay Doppler maps data, which were greatly disturbed by the attitude, are selected to test the effectiveness of the proposed algorithm. The accuracy of wind speed retrieval is analyzed, and results show that the data calibration algorithm is effective in reducing the wind speed retrieval error. Compared with the un-calibrated data, the data subjected to the calibration algorithm show a significant improvement of 19.33% in correlation coefficient and average decreases of 30.91%and 42.57% in root-mean-square error and mean bias error, respectively. Moreover, the comparison highlights that the influence of the satellite platform attitude disturbance on wind speed retrieval is abated significantly. The proposed approach can effectively improve the quality of GNSS-R measurements, allowing for a better understanding of global weather abnormalities and generally improving weather forecasting.

We proposed a system to develop the project using deep learning algorithm. Recently, deep learning and Artificial intelligence has plays a big role in various industries fortheir improvement and development. So we tried to implement deep learning algorithm to train our model based on the previously collected information about the satellite image. With the help of the images get from the satellite we train our model before train our model we need pre-process the data for more accurate prediction. After the pre-processing train our model andmeasures our model performance by metrics. With the accuracy score we say how well our model is trained based on the given input.

MODULES DESCRIPTION

IMPORT THE GIVEN IMAGE FROM DATASET: We have to import our data set using keras preprocessing image data generator function also we create size, rescale, range, zoom range, horizontal flip. Then we import our image dataset from folder through the data generator function. Here we set train, test, and validation also we set target size, batch size and class-mode from this function we have to train using our own created network by adding layers of CNN.

TO TRAIN THE MODULE BY GIVEN IMAGE DATASET:
To train our dataset using classifier and fit generator function also we make training steps per epoch's then total number of epochs, validation data and validation stepsusing this data we can train our dataset.

FUTURE ENHANCEMENTS

Medical department wants to automate the detection of satellite images from eligibilityprocess (real time). To optimize the work to implement in Artificial Intelligence environment.

CONCLUSION AND FUTURE SCOPE

The utilization of artificial intelligence techniques for satellite image classification marks a transformative advancement in the field of remote sensing and data analysis. Through the exploration of diverse machine learning and deep learning methodologies, this endeavor has demonstrated the potential to revolutionize the way we interpret and utilize satellite imagery. By customizing and developing architectures that capture intricate spatial, spectral, and textural patterns within satellite images, we have successfully achieved more accurate and efficient land cover classifications. The scope of satellite image classification using deep learning techniques outlines a comprehensive exploration of how these advanced AI methods can revolutionize the accuracy, efficiency, and practical applicability of remote sensing data analysis for diverse real-world scenarios.

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