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Remote Sensing through Deep Neural Networks for Satellite Image Classification

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Abstract : Satellite images in detail can serve an important role in the geographic study. Quantitative and qualitative information provided by the satellite and remote sensing images minimizes the complexity of work and time. Data/images are captured at regular intervals by satellite remote sensing systems, and the amount of data collected is often enormous, and it expands rapidly as technology develops. Interpreting remote sensing images, geographic data mining, and researching distinct vegetation types such as agricultural and forests are all part of satellite image categorization. One of the biggest challenge data scientists faces while classifying satellite images is finding the best suitable classification algorithms based on the available that could able to classify images with utmost accuracy. In order to categorize satellite images, which is difficult due to the sheer volume of data, many academics are turning to deep learning machine algorithms. As, the CNN algorithm gives high accuracy in image recognition problems and automatically detects the important features without any human supervision and the ANN algorithm stores information on the entire network (Abhishek Gupta., 2020), these two deep learning algorithms have been used for satellite image classification. This project focuses on remote sensing through Deep Neural Networks i.e., ANN and CNN with Deep Sat (SAT-4) Airborne dataset for classifying images. Thus, in this project of classifying satellite images, the algorithms ANN and CNN are implemented, evaluated & compared and the performance is analyzed through evaluation metrics such as Accuracy and Loss. Additionally, the Neural Network algorithm which gives the lowest bias and lowest variance in solving multi-class satellite image classification is analyzed.

Keywords : artificial neural network, convolutional neural network, remote sensing, accuracy, loss
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