IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 1, March 2024

A High-Efficiency Satellite Image Classification Method for Real-Time Application Using Augmented Incremental Transfer Learning

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Abstract: *Researchers have put forth a range of models for processing satellite images, each with distinct data formats and processing requirements. One limitation arises from variations in the forms of modules, such as the image capturing and feature extraction modules, impacting accuracy and scalability in real-time scenarios. This passage introduces and explores a pioneering very competent temporal engine crafted specifically for classification of real-time satellite images. The proposed approach utilizes augmented incremental transfer learning, aiming to mitigate the limitations associated with diverse processing requirements. This approach involves capturing real-time satellite data through Google's Earth Engine and subsequently processing it using a Convolutional Neural Network (CNN) based on transfer learning. The CNN employs backscatter coefficient analysis, utilizing coefficients derived from Precision Image's average intensity value across a distributed target. By integrating incremental learning and CNN for classification, the model achieves an impressive average accuracy of 98.06% in detecting crop type and severity of damage. Comparative analysis with state-of-the-art approaches reveals the superiority of the proposed model. It outperforms existing models by 5% in accuracy, showcasing its efficacy in satellite image processing and classification.*

Keywords: Earth, Satellite, crop, type, damage, classification, deep learning, incremental, transfer, accuracy, precision, recall

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