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ABSTRACT

The urbanization rate of India in 35.9 percent approximately by 2022 reports. Among 35.percent , 45.23 percent of urbanization is happening in Maharashtra and it is the third most urbanized states of India after Tamil Nadu and Kerala. Over the decades, remote sensing has focused on the classification of land cover from Satellite images in urban areas. Classifying buildings in urban areas from very high resolution (VHR) satellite images is a complex task due to the presence of complex structures and limited labelled data. Traditional approaches for building classification include hand-crafted features, transfer learning methods. These methods often struggle with the variability in building shapes, orientation, and viewpoint, leading to low accuracy in densely populated urban areas and limited performance when dealing with high-resolution satellite images. A deep learning based approach for semantic segmentation using U-Net with backbone of ResNet34 is proposed for building classification. Urban area Dataset with Images of 0.5m resolution is prepared from SAS planet. Median Filter and Gaussian filter are used for noise removal. False Color composite and Canny Edge detection are used for image enhancement. One hot Encoding is applied for classifying buildings. U-Net is trained with encoded data. The proposed model is evaluated on the Indian dataset, specifically the urban areas of Nashik, Maharashtra and the accuracy obtained for the dataset is 60%.

Keywords: Feature Extraction, Convolutional Neural Networks, VHR images, Semantic Segmentation, Resnet 34, Building Classification