

# Automatic Detection of Building, Surface Area, and Roof Type in UAV Imagery Using Deep Learning

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## SUMMARY

The availability of high-resolution remote sensing images and the advancement of computer vision applications have shifted the automatic extraction of building footprints to the next level. So, automatic detection and segmentation of buildings have become essential in many computer vision applications. It has been one of the major research areas, which is in trend nowadays. Identifying regions in an aerial image and levelling them into different classes is challenging. Getting a high-resolution hyperspectral image is costly, so we introduced a low-cost high-resolution image to extract the building footprint. For this, we used UAV for image acquisition. The obtained image is then processed and fed to the model. We have used a CNN model for the segmentation of the building footprint. The accuracy of the segmentation model is 97.17% in training data with a loss of 7.75%, val\_loss of 17.50% and val\_accuracy of 93.86%. After the detection of buildings, the data aids in various aspects and underscores the importance of building detection and its applications across multiple fields such as urban planning and development, disaster management, environmental monitoring, real estate and property management, security and surveillance, technological innovation, and public health by providing essential data for efficient decision-making and planning.

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