

Feature Extraction from Sub-Decimeter Resolution Images Using Convolutional Neural Networks

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Abstract

Deep Learning has a wide sphere in analysis of the problem. One such problem which is in high demand for research is the extraction of features and pixel-level classification of aerial images which requires the ability to learn the concepts from spatial data. The aim of this paper is to use Convolution Neural Networks to learn those variations by using the state-of-the-art downsample-then-upsample architecture. The overall goal of labeling every pixel of the original resolution is achieved through this architecture. The results show that the overall accuracy is good; there is an improvement in the predicted geometric accuracy and during the inference time the efficiency is also high. The proposed architecture is tested on Potsdam sub-decimeter resolution dataset which is given by the ISPRS and it comprises many annotated tiles for the evaluation of systems using spatial data in an unbiased way.

Keywords: Ultra-high resolution images, Subdecimeter spatial resolutions, deep learning, classification, semantic labeling, convolutional neural networks (CNNs), deconvolution network