

Instance Segmentation of Wildfire Smoke Plumes using Mask-RCNN

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Abstract : Detection and segmentation of wildfire smoke plumes from remote sensing imagery are being pursued as a solution for early fire detection and response. Smoke plume detection can be automated and made robust by the application of artificial intelligence methods. Specifically, in this study, the deep learning approach Mask Region-based Convolutional Neural Network (RCNN) is being proposed to learn smoke patterns across different spectral bands. This method is proposed to separate the smoke regions from the background and return masks placed over the smoke plumes. Multispectral data was acquired using NASA's Earthdata and WorldView and services and satellite imagery. Due to the use of multispectral bands along with the three visual bands, we show that Mask R-CNN can be applied to distinguish smoke plumes from clouds and other landscape features that resemble smoke.

Keywords : deep learning, mask-RCNN, smoke plumes, spectral bands

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