Sensor-Independent Deep Learning for Cloud Masking

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Abstract

Cloud masks have traditionally been computed using thresholding methods, which benefit from expert domain knowledge and generally do not require training data. Recently, machine learning's performance has---in many fields---overtaken that of traditional methods, by using large amounts of labelled data to learn complex statistical relationships from. However, this need for labelled data is costly and creates a bottleneck for widespread adoption of the technology. This is further compounded in Remote Sensing by the large variety of sensors used, meaning labelled datasets must be made for each new satellite sensor. In this work, we explore a novel convolutional architecture that could help circumvent this issue, and lead to sensor-independent algorithms. This new model is prototyped on the problem of cloud masking, as evidence that our approach will result in high performance models that are generally applicable to a wide range of satellites simultaneously. We hope this work will incentivise ESA and the wider EO community to continue producing high quality labelled datasets on a range of sensors, in order to fully exploit this new methodology, and better validate existing ones.

Keywords – AI for CAL/VAL