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Country-wide Cross-Year Crop Mapping from Optical Satellite Image Time Series

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Previous works on vegetation mapping from optical satellite images use training and test datasets within the same year. We think that from a practical perspective, this experimental setting is not realistic due to (i) crop growth changes from year to year (also like from region to region), therefore test assessment does not fully reflect real-world cases and (ii) obviously it is not possible to apply the algorithm current year if it is trained with current year data. Thus a cross-year experimental setting should be de-facto for this line of research then we can readily apply developed algorithms in real-world applications. In this work, we evaluate a state-of-the-art crop classification method from optical satellite (Sentinel-2) image time series data - a hierarchical multi-stage deep learning method, i.e. ms-convSTAR which we introduced in [1] - in a cross-year experimental setting. The deep learning model is trained with the entire 2021 crop dataset in Switzerland and during test time it is applied to the 2022 crop dataset. Our results show that our method performs reasonably well in this experimental setting achieving ~83% accuracy at the pixel level.

References

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