

Meadow orchard detection using deep learning

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Introduction

As ecologists using remote sensing, most methods are based on spectral properties. However this method has its limitation in detecting spatial patterns reliably, like meadow orchards. Deep learning could prove to be a vital tool to complement established methods. Presented are the preliminary results, as final adjustments are still open.

F1 | Training area in NRW-DE

Methods

Data

DOP & DLM NRW
VGG16 model

Data augmentation

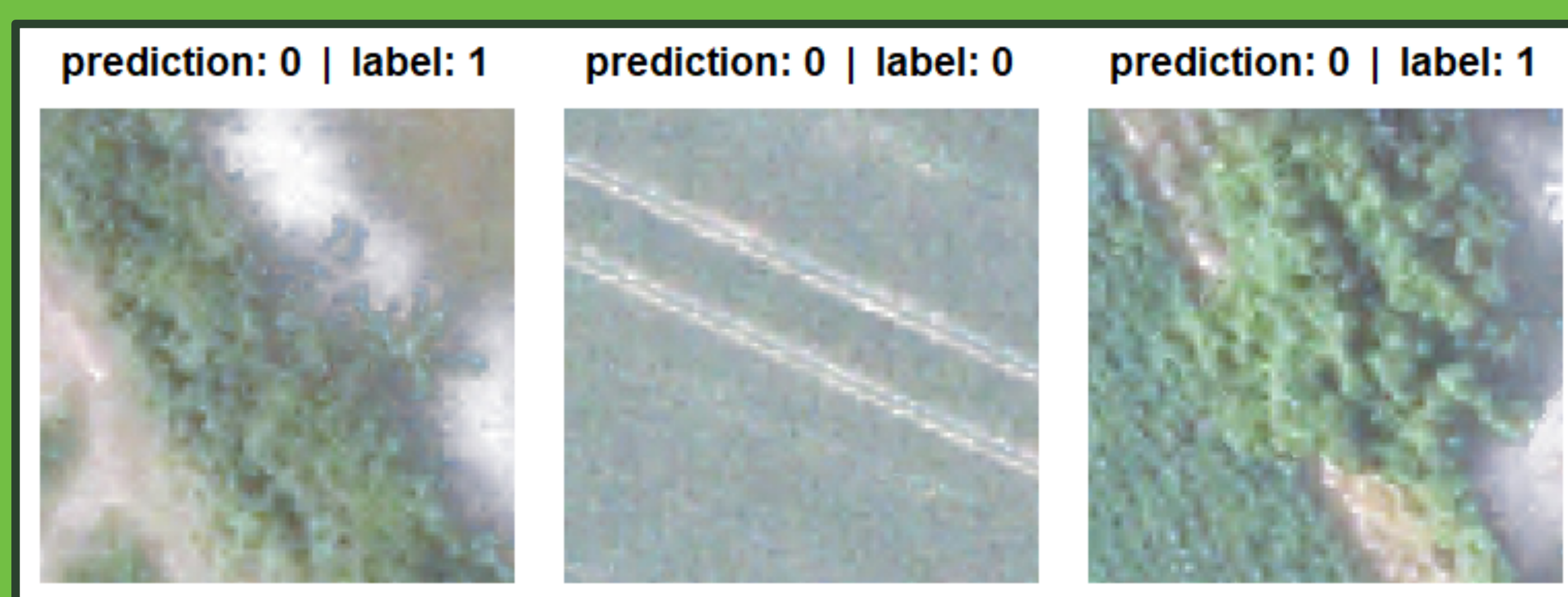
Cut raster into
128x128 jpegs
Flip and mirror
images

Train model

True & Fals data
Pre trained model
for edge detection

Predict & Validate

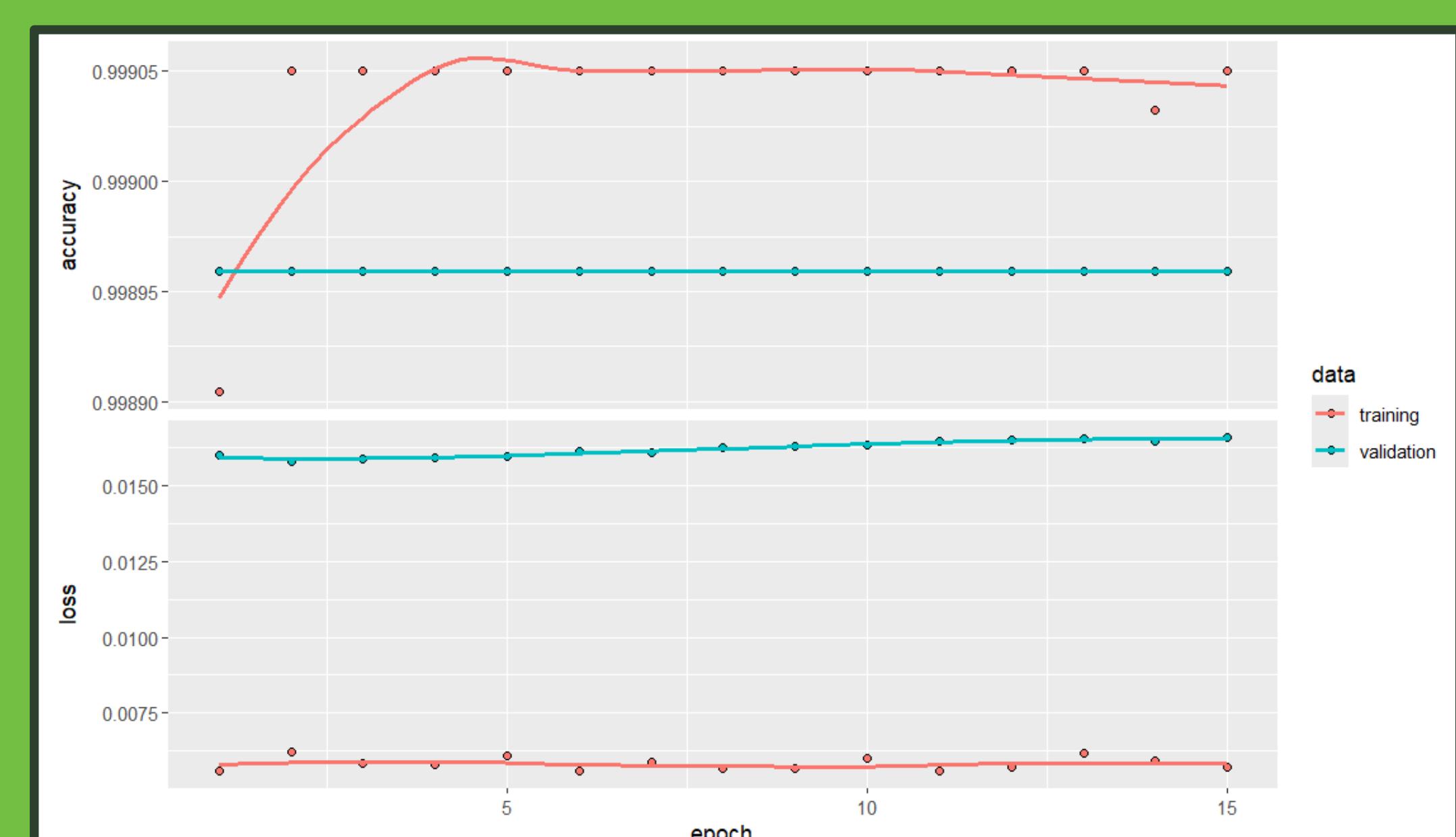
Results



F2 | Predictions for the individual image tiles and the label assigned by the mask



F3 | Mask as training input for the model showing the meadow orchards. Final prediction will produce a similar output as result.



F4 | Fit of the trained model to the validation data. Close lines indicate a good fit of the model

Outlook

Next and final steps will be the creation of a prediction map, similar to the mask shown. Finally a validation using the test data will be performed, assessing the quality and applicability of the model.



Final results and all data
will be available on GitHub

Sources:
https://ilochro.github.io/ogh_summer_school_2020/tutorial_DL_UAV
Vector shapes by uecteezy.com
Software: R 4.4.1, Rstudio 2024.04.2, Python 3.12, QGIS 3.28.11-Firenze, Windows 11

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