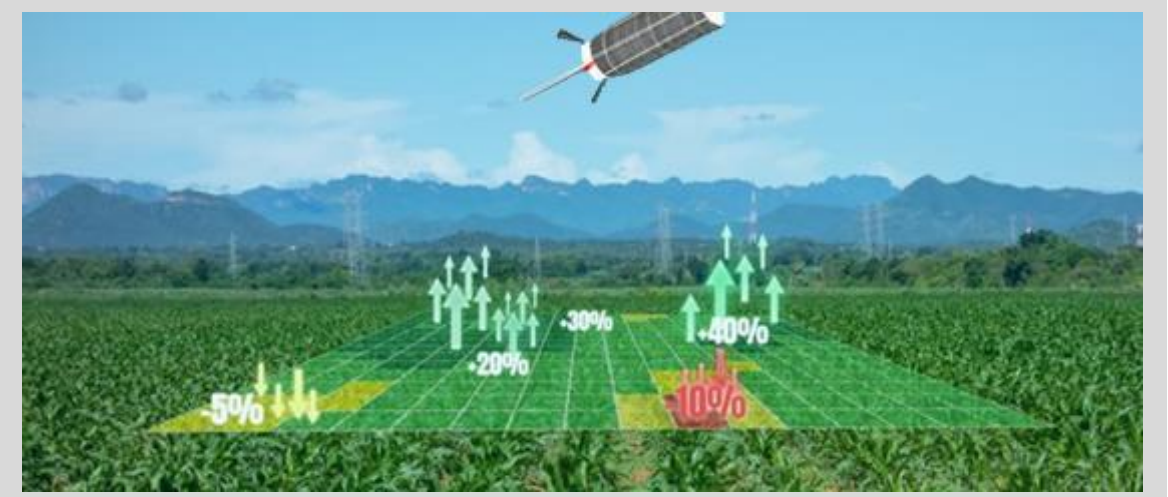
Master of Science Project

Geoscience and Remote Sensing

Predicting crop yield using optical remote sensing



Monitoring crops is one of the prime objectives of the Copernicus Land services. Indeed, land use and land cover maps are amongst the most widely used products. At the same time, there is an increasing demand for more complex products, to directly estimate crop yield information with satellite observations and allow for precision agriculture.

Within a recent project for the Netherland Space office, work has started on developing a crop yield product that uses high resolution satellite remote sensing. By using merging satellite observations from multiple sources (i.e., multi-modal remote sensing), the seasonal dynamics of relevant land surface parameters, such as Leaf Area Index (LAI), Specific Leaf Area (SLA), chlorophyll content and soil moisture can be obtained. By integrating these variables with a detailed crop-growth models, a agricultural digital twin of the Netherlands can be created that is capable of not only monitoring full canopy biomass curves but also predicting crop yields. On basis of previously executed work the student will assess the potential of this system for over about 50-80 parcels representing maize and winter barley in the Netherlands. Using this system the student will execute a cross-calibration and validation analysis, and advance remote sensing techniques.

Proposed Activities

- Create vegetation-growth digital twin to predict crop-yield by integrating multivariate information from multi-modal remote sensing in crop models
- Validate the satellite-driven yield predictions with data.
- Asses projected yield accuracies against model scenarios.

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University Graduation Topic - MSc CME

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