

Automatic Field Delineation

Introduction

Agriculture plays a vital role in food security and economic growth of most of the countries in the world. Precision Agriculture is one of the modern and efficient agricultural practices. It manages variations in the field accurately to improve agricultural yield by reducing fertilizer and production costs. It also reduces pollution through less use of chemicals.

One of the main tasks in precision agriculture is field delineation as it provides a valuable input for agricultural applications such as yield estimations, monitoring of the crop.

Conventional field surveying methods can be used to delineate farm fields, but this method is time consuming and it is also highly dependent on the operator's capability of digitization and interpretation. Efficient method would automatically delineate the farm fields.

However, the automated delineation of fields is a challenging task because of their irregular shape and also physical edges between the fields are often indistinct in satellite imagery and contours need to be identified by considering the transition of the complex textural pattern between fields. In these circumstances, standard edge-detection algorithms fail to extract accurate boundaries.

Within the scope of the Copernicus Hackathon Sweden, the following objectives are provided to set the context.

1. Selecting best suited Machine learning or Deep learning algorithms to segment the fields for low resolution satellite image
2. Develop a model for field delineation in real time

Challenge

Main objective is to delineate the farm field accurately in real time with use of machine learning or deep learning algorithms. The following challenges are provided as a guidance, but the participants are encouraged to work on any complex solution deriving from them

1. Survey on the machine learning or deep learning algorithms used for field delineation
2. Develop a best model that segments the farm field
3. Test the model across various fields in the world, considering both small and big fields.

Data

Sentinel-2 data

Programming Skills

MATLAB or Python

References

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