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Crop Auditing
Application to identify crops and monitor growth

Resume for Jerónimo Martins

The agricultural audit process in large crop fields continues to rely heavily in site inspections and manual checks, making it slow, expensive and hard to scale. Financial institutions, insurance companies and entities (local, national and european level) responsible for managing agricultural subsidies need to validate information such as crop type and its development status. However, current methods have plenty significant operational limitations, such as larger scale fields.

In addition, there are high costs associated with the deployment of technical teams, traditional processes are subject to delays, information inconsistencies, and higher risk of fraud. Thus, there is a clear opportunity to develop technological solutions capable of automating agricultural monitoring, increasing data transparency, and supporting faster and more efficient decisions.

Our project, CropAuditing, is a tech solution based on the integration of satellite imagery (Sentinel-2), temporal analysis of vegetation indices (NDVI, SAVI, EVI, NDRE, LSWI), and machine learning models for the automatic identification of agricultural crops and monitoring their growth (LightGBM machine learning model).

Our app allows users to analyse agricultural areas, identify the cultivated species, visualise its vegetation heatmap, track different growth stages, and compare information declared by farmers with data obtained by satellite. Our main target, are agricultural insurers, financial institutions that grant agricultural credit, public entities responsible for allocating subsidies and farmers.

Therefore, our project can be expanded to implement different functionalities such as early pest detection, nutritional monitoring of crops and support for precision agriculture. The costs associated are related to software development, data processing, web platform hosting, and optimization of machine learning models. In the medium term, the solution can be profitable through subscription models and platform licensing.

To sum up, automating agriculture validation processes can allow user entities to reduce operational costs, increase the efficiency and minimize losses associated with frauds. Our project got validation by IFAP, Besquare, VirtuaCrop and Food4Sustainability.