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Leaf Recognition

We propose to implement a program that will recognize leaves in a crop. The dataset contains 475 images from a real vineyard using a robot and manually annotated with four leaf area index classes in three regions of interest (ROIs). The value is inserted in the four classes: 0% leaves, 33% leaves, 66% leaves, or 100% leaves. When there are a few leaves, but in small quantities never exceeding half of the total area, it is 33%. If a large part of the area is covered with leaves, but not totally covered, it is considered 66%, and when the whole area is filled with leaves, it is considered a 100% class. To detect the leaves, we propose the following solution.

Methodologies
- Train the algorithm
  Using an SVM to train 80% of the algorithm and validate with other 20%

- Using two different approaches:
  We will use the two descriptors, one with the best accuracy and another with the worst accuracy executed in the previous study presented here: Electronics | Free Full-Text | Smarter Robotic Sprayer System for Precision Agriculture (mdpi.com).

Comparison
By comparing the results of the two approaches we will see the differences between them and propose improves.

Disclaimers
1. For our project we will mostly focus on leaf detection, that is, if there are leaves or not in the ROI, and in which class they belong.

Dataset
The dataset can be found here

Vineyard dataset with anotation of leaf density - for precision spraying - Datasets - CKAN (inesctec.pt)