Soil Food Intelligent Analysis

Proposta de Projeto

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1 Objetives

Organic farming and alternative environmental movements always strived to improve fertility and health of living soils. Still, most of the attempts are not using scientific methods, which leads to possible misleading or not well understood practices. A scientific approach on the subject in being developed in the last decade, but it is not mainstreamed due to costs and accessibility of well defined processes, as well as automatic measurements. This project will be developed in cooperation with "**Ananda Valley**" sustainability project, located 20 km far from UBI, supportive of scientific studies of environmental topics and Big Data Analysis techniques.

In particular, this project aims at defining a simple process to gather and annotate microscope-aided video and still images from soil samples. Also, the most important features features to discriminate between healthy and fertile soils should be identifies. Based on such features, an image classification/regression should be developed, in order to predict the fertibility of soils.

Figure 1: Illustration of the main goal in this Project: develop one automated system able to detect and classify some prominent elements in a soil image.

2 Workplan

T1: Study of deep learning-based frameworks for image analysis;

T2: Implementation of the solution designed;

T3: Tests and optimization;

T4: Report writing.

3 Academic Prerequisites

- Interest about Artificial Intelligence and Machine Learning domains
- Interest in learning *Python* + *Tensorflow*.

4 Expected Results

- 1 computational prototype
- 1 report

5 Contacts

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