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| Master of Information Systems |
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| **Work Proposal** |
| School year of 2019/2020 |

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| Title: | Almond Variety Detection using Deep Learning |
| Type of Work | Project |
| Supervisor: | Maria João Varanda |
| Co-Supervisor(s) | Paulo Alves |
| Date of proposal: | December 2019 |
| Remarks | This work will be developed by Benarous Farouq |

# Goal

# Automatic Detection of Almond Variety based on image processing and artificial intelligence techniques

# Description

In the Trás-os-Montes region, where the IPB is located, is rich in almond production and several varieties have been detected. It is possible to identify to which variety an almond belongs based on the evaluation of a set of parameters. The idea will be to automate this process using almond images in various contexts and positions. This will require collecting previously identified images to train and test variety identification models using image processing techniques and artificial intelligence techniques such as deep learning.

# Work Methodology

The methodology that will be adopted is based on the collection of a large number of images, their classification through the established parameters to be used by machine learning techniques, the choice of a model that can be trained with these images and which allows the identification of the almond variety in future images. For this purpose, will be used image processing tools, the python language and data science libraries.

# Activity Schedule

January – State-of-the art about similar problems and data collection (for training and testing);

February – State-of-art about machine learning approaches and study of a specific deep learning architecture,

March – Creation of a data set and image classification using deep learning;

April – Model implementation using training data;

May – Test the model with test data;

June – Optimize the model;

July - Write of the thesis.

# Prerequisites

Some experience in machine learning techniques and image processing.

# Infrastructures and Resources Needed