

Visão Computacional

5º ano – Engenharia Mecânica (Sistemas) – 1º semestre

2018/19

Work 1 – Problem 3

Introduction

The main objective of this project is to exploit different solutions to achieve the proposed goal. It is not necessary to find a definitive solution, but only to gain experience in how easy/difficult the problem can be. Therefore, the working time dedicated to this work should pay attention to this point and, as expected, the final mark of the work will have in consideration more the effort put to exploit solutions approaches to the problem than to the quality of the results.

As already said this work covers a limited part of the subjects of this discipline and does not replace the work proposed to the labs. Pay attention that part of the exam questions will be based on the work proposed to the labs.

All the proposed problems are to be solved using matlab16b. Other versions of matlab may not include some used functions and relatively to Simulink, provided files are not compatible with previous versions of matlab.

Report:

The report must be submitted in Fenix, as a zip file having inside the pdf of the report, the written matlab code and other support material. If, for any reason, it is interesting to join a film or a large set of images, those files may be transferred to me in a different way (e.g. dropbox). The zip file name should follow the following pattern: G<n>_<st. number_st number>, e.g. "G10Q_22222_33333.zip"

Problem 3: earth surface characterization from aerial images

Currently, earth surface characterization from aerial images obtained using drones has a huge set of applications. For fire prevention and fighting is important to recognize the type of existing coverage, like, grass, water, roads or paths, buildings, etc. This work intends to constitute a contribution based on a set of provided images, exploiting studied techniques

Objectives:**Objectives:**

For the given image collection, it is intended:

- 1) To segment each image in superpixels using the SLID algorithm (matlab function). To study the influence of its different parameters in the result.
- 2) To merge neighbors superpixels if they correspond to the same type of coverture. For this purpose, different techniques studied in this course should be tried. Students should also search the internet on this topic.
- 3) To propose a set of descriptors that may be used in an automatic classification of the detected regions. These descriptors or others can be used in classifiers to be designed in “Intelligent Systems”, but they will only be evaluated in that discipline.

The performance evaluation of this work in this discipline will be merely visual. However, the final mark of the work can increase until 1 value, if the results presented in “Intelligent Systems” are considered very good.

In the images with clearly countable trees, it would be interesting to count them automatically.

Provided images:

DSC07713_geotag.JPG

DSC07718_geotag.JPG

DSC07721_geotag.JPG

DSC07723_geotag.JPG

DSC07727_geotag.JPG

DSC07742_geotag.JPG

DSC07744_geotag.JPG

DSC07750_geotag.JPG

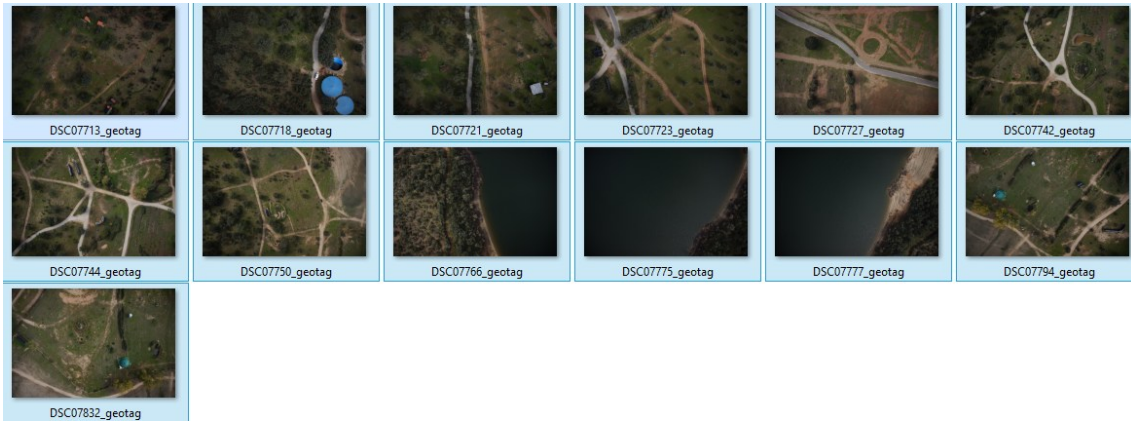
DSC07766_geotag.JPG

DSC07775_geotag.JPG

DSC07777_geotag.JPG

DSC07794_geotag.JPG

DSC07832_geotag.JPG



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