Edges and contours

October 2016

Abstract

This session will exercise linear filters and edge operators. In the folder downloaded from the Campus Virtual you will find all the material you will need for this session. Follow the instructions and answer the questions.

Contents

1 Determine the optimal edges

Create a file "exercise1.m" to implement the following steps:

- Read the image "starbuck.jpg" and find its edges.
- Apply different operators and find the optimal parameters for each of them.
- Overlap the edges on the image as shown in Fig.2 (right).
- Repeat the experiment on 3-4 other images.

Answer the following questions in the report:

1. How many ways do you know to obtain the edges of the image?
2. Which is the best edge detector?
3. Which are the optimal parameters of this operator for the image "starbuck.jpg"?
4. What are the advantages and disadvantages you see when extracting the edges on the different images?
5. Discuss if the parameters should be changed.

Figure 1: Original image (left), edges extracted (middle) and overlapping of edges and original image (right).

2 Enhancing images with edges

Overlapping edges on images are sometimes used in order to enhance the main structures of the images, perceive better the motion of the objects and for other visual effects. Create a file "exercise2.m" to implement the following steps:

- Read the video video Maldives.mp4 (Help: VideoReader).
- Enhance the edges and overlap them on the video Maldives.mp4.
- Show the video with the extracted contours as movie.

Answer the following questions in the report:

1. Save some frames of the video with the extracted contours.
2. Discuss which is the best way to obtain the edges and check which are the best parameters.
3. What advantages and disadvantages do you see on the obtained effect?

Figure 2: Visual effects by enhancing edges in images.

3 Practicum submission

The evaluation of the practicum will be based on the code and report that must be submitted (via campusvirtual2.ub.edu) in a file "StudentName1+StudentName2_CV_Lab2.zip". More specifically, the submission should contain:

- A report entitled "Edges and contours" including the results of the problems properly commented and all necessary images to fully understand your discussion. The report must provide answers for all questions, results obtained and conclusions about them, as well as observations and difficulties found during the procedure.
- The files with the solution of the exercises. The Matlab code should be properly commented, including description of the developed functions.

Deadline: 10 of October, 23:55h by Campus Virtual.