Laboratórios de CVI

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Exercises 1

Exercise 1.1 – Read and e visualization of an image;

OpenCV/matlab methods: *imread()*; *namedWindow()*; *imshow()*; imagesc(); colormap; *waitKey()*

Exercise 1.2 – Restauration/denoising of an image

Given an image, introduce gaussian noise. Then, remove the noise using a "mean" operarion. This can be done using the following operations:

- image filtering: *imnoise(), fspecial()*, *imfilter();*
- temporal filtering of the images (sum of the de images): *sum()*

Introduction of the "salt and pepper" noise. Perform the denoising using the "median" operation

- image filtering: *medfilt2()*

Exercises 1 (cont.)

Exercise 1.3 – Selecting a region of interest in the image and resizing the interest region

OpenCV/matlab methods: *ginput()*; *roipoly(); imresize();*

Exercise 1.4 – Geometric operations over the image

- rotation operation of the image: *imrotate();*
- understanding the geometric meaning

Exercises 2

Exercise 2.1 – Morphologic operations and creation of the morphological structures

OpenCV/matlab methods: strel() *('square', 'line','disk','ball')*; *imclose()*; *imopen(); imerode(); imdilate()*

Exercise 2.2 – Properties and measures of the regions in an image

OpenCV/matlab methods: *bwlabel()*; *regionprops()*

Exercises 3

Exercise 3.1 – Compute histograms in images, histogram equalization, threshold operation (Otsu method – visualizing convex regions)

OpenCV/matlab methods: *imhist(); histeq()*; *graythresh()*

Exercise 3.2 – Read of a video, compute histograms in video, and creation of a background model

OpenCV/matlab methods: *imaqhwinfo(); mmreader(); median();*

Exercises Práticos 4

Exercise 4.1 – Operators of Canny and Marrhildred, effects visualization of these operators in images

OpenCV/matlab methods: *edge(); opções ('canny', 'marrhildred')*

Exercise 4.2 – Video, histograms in videos, histograms distance, other methods to create background models and texture analysis

OpenCV/matlab methods: *imaqhwinfo(); mmreader(); median();*

Exercícios Práticos 5

Exercise 5.1 – Implementation of the Hough transform, interpretation and visualization of the results

Exercise 5.2 – Presentation of an example (to be done by the professor) that illustrates the usefulness of the transform.