Czestochowa University of Technology

Faculty of Mechanical Engineering and Computer Science

Computer vision, pattern recognition and image retrieval

Laboratory 6

Topic: *Feature detection*

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Technical support for Matlab is available on the website: http://www.mathworks.com/

In Lab 06 you will create an application to detect features and key points in a digital image. Application development should be done in the same way as in laboratory 2. The next tasks are the next operations of image transformation.

Exercise 1

Please create a new application "Lab06". There should be 3 Button objects and 2 Axes objects on the form. The first "Close" button should close the form. The second "Open" button should read a color image (type .jpg, .png, .bmp) from the selected file and display it in Axes. The task of the third button ("Gray") is to convert a color image loaded with the "Open" button into a gray image. The gray image should be displayed in the second Axes object. (Lab02 has detailed instructions on how to do this).

Exercise 2

Please add a fourth "FAST" button and a third Axes object. In this button, please program the detection of key points with the FAST detector in the gray image. This can be done using the "detectFASTFeatures" function. Then, referring to "Location", we obtain the coordinates of the characteristic points. A color image should be displayed in the new Axes with white pixels.

Exercise 3

Please add another "Harris" button. In this button, please program the detection of key points with the Harris detector in the gray image. This can be done using the "detectHarrisFeatures" function. Then, referring to "Location", we obtain the coordinates of the characteristic points. A color image should be displayed in the new Axes with white pixels.

Exercise 4

Please add another "MinEigen" button. In this button, please program the detection of key points with the MinEigen detector in the gray image. This can be done using the "detectMinEigenFeatures" function. Then, referring to "Location", we obtain the coordinates of the characteristic points. A color image should be displayed in the new Axes with white pixels..

Exercise 5

Please add another "SURF" button. In this button, please program the detection of key points with the SURF detector in the gray image. This can be done using the "detectSURFFeatures" function. Then, referring to "Location", we obtain the coordinates of the characteristic points. A color image should be displayed in the new Axes with white pixels.

Exercise 6

Please add another "MSER" button. In this button, please program the detection of key points with the MSER detector in the gray image. This can be done using the " detectMSERFeatures " function. Then, referring to "Location", we obtain the coordinates of the characteristic points. A color image should be displayed in the new Axes with white pixels.

Please send only the „Lab06.mlapp” file to the moodle platform as an answer.