Bogazici University, Electric Electronic Eng.
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Date: 21.02.2024
Due date: 28.02.2024 t:19:00

EE 576 - Project 1

The project aims to familiarize you with OpenCV image reading, showing and interaction.
Your code should be as **modular** as possible. This means that

All the parameter settings and method-class definitions should be in a header file (*.h or *.hpp files)

The code should not have any numbers directly - rather you should use parameter values as defined in the header file.

The methods-functions need to be defined in a separate *.cpp file

The main method should be minimal as possible

The code should not contain any references to your local directory setup.

1. Consider the dataset provided. Make a directory named `Data` under your directory where your sources are. You are asked to write C/C++ code that will do the following:

1. Read a number n from user input
2. Read the n th image to OpenCV Mat as necessary as long it is a legitimate number wrt to the dataset;
3. Determine the dimensions of the image. Suppose these are N_1 (rows) and N_2 (columns).
4. On the screen, open an empty image of size $(2N_1' \times 2N_2')$ where $N_i' \leq N_i$, $i = 1, 2$. Hence you can display images in a 2×2 grid arrangement. In case the image dimensions are large, pls resize images so that all the images in the grid are visible.
5. Display the input image in the first cell of the 2×2 grid arrangement.
6. Display the rotated image in the second cell of the 2×2 grid arrangement.
7. Ask the user to input a point in the first image. You can use mouse to determine the matching points. (As an example, pls refer to code: `https://www.opencv-srf.com/2011/11/mouse-events.html`). Display the region-of-interest (as masked by a small sized rectangle) around this point in the third cell.
8. Ask the user to input the corresponding point in the second image. Display the region-of-interest (as masked by a small sized rectangle) around this point in the fourth cell.
9. Repeat this as long as a legitimate number is input. Otherwise, stop running the program.

General guidelines regarding the preparation - submission of projects:

Please be sure to read the Project Grading Policy in the course syllabus.

Please also make sure that your hand-in complies fully with the instructions as specified therein.

If you are familiar with OOP, you may use C++ and generate the appropriate classes as required.

Pls upload **source codes** in a rar/zip file named as follows `HwX_LastNameFirstNameInitial`. For example a student named Ali Kayhan would hand in his first homework with the following name: `Hw1_KayhanA.zip`. Pls do not include any executable files. Also pls do not include anydata files unless otherwise asked.