Image Processing

Study Case Assignment

1-Enhanced Template Matching

2-Colour Masking

Assignment 1 - Template Matching Assignment

Limitations of Template Matching:

Pattern occurrences have to preserve the orientation of the reference pattern image(template).

As a result, it does not work for rotated or versions of the template as a change in shape/size/shear etc. of object w.r.t. template will give a false match.

- *Assignment Part 1:*

  Enhance the template matching algorithm and let it be a rotation variant. This means that if the template's orientation is different from that of the region you are trying to match, your enhanced algorithm will fix this problem.

- *Assignment Part 2:*

  Enhance the template matching algorithm and let it be a scale variant. This means that if the template is smaller than the region you are trying to match, your enhanced algorithm will fix this problem.

- *Assignment Part 3:*

  Enhance the template matching algorithm and let it be able to detect all the areas in the original image where the template is found. (Multi object detection). You also must handle the case where you would state that the template has been found nowhere in the original image.

  You may use any images you like which would be suitable for each part.

Restrictions & Submission:

1. Submission will only be accepted on the moodle under the assignment **"Assignment 4 - Template Matching"**.
2. Each part must be the project folder submitted as a zipped file or all parts together as a single project folder with 3 python files (one for each part). The zipped file must contain all python files and all images used.
3. No submissions will be accepted via the email.
4. Deadline for the assignment is **Friday 16th of December 2022 11:59 PM**.

Assignment 2 - Colour Masking

You must implement color masking by using morphology as pre-processing for the two images attached with this pdf file.

Kindly check the table below to know which color you will be masking in the images.

BONUS: You will receive bonus points if you implement the masking for tracking the color in a captured video.

#	Id	Student Name	Color
1	2020/00148	Abdelrahman Ayman Mostafa Ebrahim Shorim	Purple
2	2020/04339	Ahmed Ehab Ibrahim Mohamed	Yellow
3	2020/09620	Ahmed Hossam Attia Abdel Maksoud	Orange
4	2020/10587	Ahmed Mohamed Said Lotfy Mahmoud Soliman	Purple
5	2020/00225	Amr Abdelaziz Elsayed Abdelaziz	Yellow
6	2020/11213	Belal Adel Mohamed Monib Elsabbagh	Orange
7	2020/00173	George Essam Ezzat Habashy	Yellow
8	2020/08121	Habiba Amr Ahmed Abdel Hameed Abdel Ghafar	Purple
9	2020/03520	Habiba Mohamed Abdel Rahman Salem	Yellow
10	2020/00171	Hana Alaa Attia Hussien	Purple
11	2020/00770	Hussein Amr talaat Abdelhalim	Orange
12	2020/04084	Jasmine Mohamed Nasreldin Mahmoud Hegazy	Orange
13	2020/00457	Julia Magdy Aziz Hanna	Yellow
14	2020/11835	Mahmoud Osama Abdeldayem Abdel Ghany	Purple
15	2020/11237	Mina Antoun Salib Sedra	Yellow
16	2020/12100	Nour Nader Shaaban Ibrahim	Orange
17	2020/05893	Salma Baligh Hamdy Hassan	Purple
18	2020/02842	Samuel Nabil Wasfy Zakhary	Yellow
19	2020/11310	Shehab Eldeen Mohamed Sadek Abdelhameed	Orange
20	2020/02130	Youssef Mohamed Ali Saleh Mostafa	Purple

Restrictions and Submission:

1. Submission will only be accepted on the moodle under the assignment **"Assignment 5 - Color Masking"**.
2. A project folder submitted as a zipped file containing any python file used and all images used.
3. No submissions will be accepted via the email.

4. Deadline for the assignment is **Friday 16th of December 2022 11:59 PM**.