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 2 - 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 15th of December 2023 11:59 PM**.

Assignment 2 - Colour Masking

You must implement color masking by using morphology as pre-processing for any images of your choice.

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.

Section:AI37402-CSC

#	Id	Student Name	Color
1	2019/09520	Ahmed Mohamed Ahmed Hamouda Mohamed El Arab	Purple
2	2019/03031	Ahmed Sherif Ahmed Mohamed Kamal	Yellow
3	2019/03558	Omar Adel ibrahim Al Zakzook	Orange
4	2018/03931	Seif AlDeen Alaa Yehia Ahmed	Pink
5	2019/02582	Youssef Rafik Ramsis Gobran	Brown

Section:AI37401-CSC

#	Id	Student Name	Color
1	2017/08584	Ahmed Tareq Mahmoud Aboali Metwally	Purple
2	2019/06207	Ahmed Waleed Magdy Abdelaziz Farrag	Yellow
3	2019/04429	Aly Khaled Ali Bayoumy Mohamed Rabie	Orange
4	2019/09154	Ashraf Saleh Mohamed Elshami	Pink
5	2019/06194	Ebraam Joseph Al Komos Metias Nasif	Brown
6	2019/13804	Farah Amer Abdelrehim Mohamed Emera	Purple
7	2019/07671	Hana Ahmed Mohamed Hassan	Yellow
8	2018/04440	Ibrahim Khaled Mohamed Sayed El Hamawy	Orange
9	2019/06120	John Nader Boshra Abdalla Gergeis	Pink
10	2018/03102	Maged Magdy Zaki Mohamed Bolbol	Brown
11	2018/07418	Majed Alaa ahmed Fathy Alkishki	Purple
12	2019/08067	Mayar Khaled Sobhy Mohamed El Shentenawy	Yellow
13	2018/02391	Merna AhmedFouad Ahmed Amin Salem	Orange
14	2018/01779	Omar Moataz Farouk Belal	Pink
15	2019/09833	Omar Mohamed Rashad Abdelaziz Elashry	Brown
16	2019/08694	Youssef Basem Shawky Abbas Amin	Purple
17	2019/09339	Youssef Mohamed Abdelwahab Mahmoud Elkhod	Yellow
18	2019/02498	Youssef Sameer Mahmoud Ali Ahmed	Orange

Section:CSC360 - New01-CSC

#	Id	Student Name	Color
1	2021/08840	Abdelrahman Ahmed Ibrahim Abdrabou	Purple
2	2021/10423	Abdelrahman Mohamed Aly Aly Halawa	Yellow
3	2021/00199	Adam Loay Hamad Gahin	Orange
4	2021/03540	Ahmed Abdelrahman Gaber Gad Abdelghany	Pink
5	2021/00403	Ahmed Mohamed Adel Ahmed Kamel Aref	Brown
6	2021/10311	Ahmed Sherif Marei Elsayed Ahmed	Purple
7	2021/04556	Ahmed Yehia Mohamed Hafez	Yellow
8	2021/10478	Arwaa Mamdoh Mohamed Mohamed Elbanhawy	Orange
9	2021/07433	Bassel Abdelrahim Abdelmohsen Shaban	Pink
10	2021/10446	Dalia Raafat Hanna Daniel	Brown
11	2021/10342	Karim Ahmed Kamal Abdelaziz Elshony	Purple
12	2021/03399	Khaled Yehia Zakaria Mahmoud Onsy Elkattan	Yellow
13	2021/03724	Marina Rizkalla Ishak Rizkalla	Orange
14	2021/06643	Mayar Adel Fayez Ahmed	Pink
15	2021/00084	Mohab Mohammed Saber Desoky Mahmoud	Brown
16	2021/10465	Mohamed Saleh Mohamed Elsayed Matar	Purple
17	2021/07190	Moshir Ashraf Danial Gaid Bahour	Yellow
18	2021/00872	Moufid Magdy Maher Sadik	Orange
19	2021/10520	Nader Maged Mazouz Tobia	Pink
20	2021/00241	Ramez Ehab Maurice Amin Makar	Brown
21	2021/10197	Saher Amr Saher Ali Khalil	Purple
22	2021/10435	Yassin Ahmed Mohamed Saleh Sultan	Yellow

Section:CSC360 - New02-CSC

#	Id	Student Name	Color
1	2021/07436	Abdelrahman Emad Mohamed Hassan Mohamed	Purple
2	2021/05856	Adham Said Ahmed Abdellatif Soliman	Yellow
3	2020/17072	Bassem Ashraf Mohamed Mahmoud Moussa	Orange
4	2021/08471	Bassem Mohamed Mostafa Ibrahim Ayoub	Pink
5	2021/02625	Farah Hany Mohtady Abdelrahman	Brown
6	2021/03635	Farah Mohamed Ibrahim Amin Ibrahim	Purple
7	2021/01461	Farid Ramy Farid Francis	Yellow
8	2021/10658	Karen Ossama Maher Foad Hanna	Orange
9	2021/10018	Mamdouh Mohamed Mamdouh Mostafa Shawer	Pink
10	2021/00022	Mario Magdy Guirguis Eshak	Brown
11	2021/00047	Mennatallah Mohamed Abdelmoaty Mohamed Emam	Purple
12	2021/06852	Mohamed Ahmed Mohamed Abdullgalil	Yellow
13	2021/03008	Mohamed Hesham Hammad Abdelwahed	Orange
14	2021/04516	Mostafa Mohamed Abdelwahab Mahmoud Elkhedry	Pink
15	2021/02697	Mostafa Wael Mohamed Elsayed Gaber Elbarbarey	Brown
16	2021/10371	Nadine Hamdy Mohamed Abdelhalim Eldieb	Purple
17	2021/10387	Nour Hesham Fekry Mohamed Ahmed	Yellow
18	2021/09765	Omar Khaled Mohamed Elbakary	Orange
19	2021/06213	Ragy Sameh Wasfy Badea Gerges	Pink
20	2021/00893	Rana Ahmed Slait	Brown
21	2021/00756	Shahd Ahmed Omar Al Farouk Mohamed ElMamoun	Purple
22	2021/06627	Shahd Khaled Salaheldin Zaki	Yellow
23	2021/04707	Yousef Abdelrahman Bakry Ahmed	Orange
24	2021/03395	Youssef Sherif Adel Rizk	Pink
25	2021/08676	Zainab Mohamed Rafea Hassan Elshafeay Elzawahry	Brown

Restrictions and Submission:

1. Submission will only be accepted on the moodle under the assignment **"Assignment 3 - 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 15th of December 2023 11:59 PM**.