

FINAL REPORT: Introduction to Digital Image Processing

CODE: 505060

I. Rules

- Each report is conducted by a group of **one to three students**.
- The report consists of 2 parts: the Programming part and the Report part.
- Only use OpenCV library and some basic Python libraries in the Programming part.
- You are **not allowed to use pre-trained models** in the Programming part.

II. Programming part

This part is consist of one programing task. Here are the contents of the part:

Programing Task 1: Given two input videos with filenames: **video1.mp4** and **video2.mp4**

The input video files are in the following link:

<https://drive.google.com/drive/folders/15IMKKVqdRqsybV7-hVhwEgIMch1mKz1H?usp=sharing>

Draw rectangles surrounding each Traffic sign in all frames of the input videos automatically, then **infer the content** of the traffic sign automatically and output it above or below the sign. Finally, save the outputs into new video files.

- Input: two input videos (video1.mp4 and video2.mp4)
- Output: another version of the input videos with a rectangle surrounding each traffic sign and its corresponding content.

III. Report part

1. The report must be submitted in **PDF format**, and the content must be written based on the report/essay format of the Faculty of Information Technology. **In case students do not follow the Faculty's format, they will receive 0 points for the Report part.**
2. The report must include the following contents:
 - a. Chapter 1: Methodology of Solving Tasks
Write a detailed description of the solving methods used in each **task** of the “Programming part” by:
 - Providing all related background knowledge or methods used in the task (thresholding, color filtering, edge detection, similarity measurement, template/feature matching ...)

- Providing a detailed explanation of main programming steps in the task
- Explaining in-detail each programming statement of the source code for the task

b. Chapter 2: Task results

Insert output images of the task in the “Programming part” into this section:

- Ten output frames with traffic signs in different time for each output video (minimum difference of time between two output frames is 4 seconds)
- Insert the link of the output videos

The images must be clear, and properly laid out. The images captions and descriptions are also required.

IV. Submission guideline

- Filenames of the source code and the report files must be the **Student IDs**, for ex.,
 - A group of only one student with student ID 521H1495 will submit a Python source file named **521H1495.py** and a report file named **521H1495.pdf**
 - A group of two students with student IDs 521H1234 and 522H4321 will submit a Python source file named **521H1234_522H4321.py** and a report file named **521H1234_522H4321.pdf**
- Filenames of the output videos must contain the **Student IDs**, and **insert Student IDs** into all frames of the output videos. In case the output videos are too large for submission in the Elearning website, you can upload them to Google Drive and share with the lecturer. In the report, you insert the link of the output videos.
- Students submit **Python source files, output videos, and a report file** to the **"Final_Report"** assignment on Elearning website of the theory class.
- Students must ensure that the Python source files are not corrupted during execution. The source code with errors will not be scored.
- Python source files must be saved in the correct format (**file extension is .py**). The source files in the wrong format will not be scored.

V. Regulations

- The result of this report will be the Final examination score.
- **Student who copy their friends's report will be scored 0.**
- **If a student's work shows signs of copying each other, the student will attend an interview with the lecturer.**

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