Practical assignment proposal

2019-20

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Major guidelines

- Students should form groups of 3-4 persons;

- The delivery deadline for the report, code, results (task3) and contributions is December 14, 2019.

- The delivery deadline for the material of the public presentation is 17 December 2019.

Deliverables

Each group is required to deliver:

- A four A4 page report in IEEE Transactions article format describing the methodology and obtained results, both qualitatively and quantitatively;

- The MATLAB code developed during the project;

- The material prepared for the public presentation of the group assignment;

- A brief description of the contribution of each element of the group to the assignment.

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The main goals are the **detection and recognition of car plates** in images of car backs.

- The practical assignment is composed of 3 tasks.

- Tasks 1) and 2) are mandatory, whereas task 3) is for valorization (3/20 points).

- The methods are to be developed using the approaches discussed during the classes.

Tasks

1) Development of an algorithm for **the detection of the car plate area**. The algorithm should detect and segment the plate and create a region of interest (ROI) containing the detected area. The algorithm should be automatic, i.e., work without any user interaction. Finally, the performance of the detection method is to be evaluated via the **Jaccard Index** of the segmented ROI.

2) Development of an algorithm **to identify the characters** (letters and digits) that form the plate. The algorithm should be applied to the plate images that can be obtained from the ground-truth (GT) of the first task. The performance of the method is to be evaluated via the percentage of well recognized chars in each plate.

3) Application of the developed algorithms to a dataset containing a limited number of images that were acquired in hard light or weather conditions. The results of the two algorithms developed in the previous tasks should be delivered and will be evaluated by visual inspection.
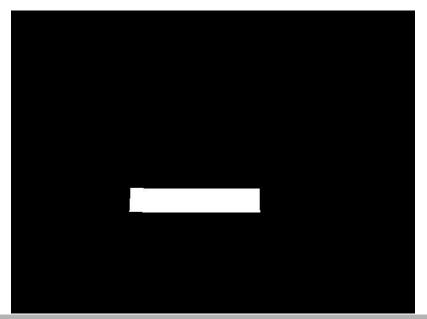
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Datasets

Each task has its own dataset with the corresponding Ground Truth (GT). The images in the datasets were taken from the datasets available at http://www.zemris.fer.hr/projects/LicensePlates/english/.

Task 1 dataset: This dataset is formed by 40 images and the corresponding GT (formed by a binary image where the plate area is represented with white pixels). One example is shown below, with the original image on the left and the GT on right.

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Task 2 dataset: This dataset is obtained from the dataset of task 1, where each image now contains only the car plate region. An example is represented below.

The GT for Task 2 is formed by the sequence of chars that can be identified in the plate (without spaces or symbols other then letters or digits). In the case of the image of the example the GT is the following sequence:

ZG8297I

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Task 3 dataset: This dataset is formed by 10 images with a higher level of difficulty. No GT will be available for students. Some examples are presented below.