

Počítačové videnie - Úloha - Klasifikácia

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Files

Download files from the website. In the zip file there is dataset and prepared source files for your project.

GUI

GUI is defined in files `main.m` and `main.fig`. Dataset is loaded with `load_dataset.m`. Do not change these files unless it is absolutely necessary.

Implementation

Implement the logic of the project in `is_photograph.m` and `compute_tresholds.m`. You can add additional m-files with your functions and/or you can use local functions.

Task

Image classification

Your task is to determine whether an image is a painting of a photograph. You will use 3 features extracted from the image for classification.

Features

- Paintings contain more highly saturated pixels (Saturation in HSV is more than 75%).
- Paintings contain more unique colors.
- Paintings have more color edges.

Color edges

Color edges

We obtain color edges if we suppress the the intensity part of the image. For this purpose you will utilize $R_n G_n B_n$ color space.

$R_n G_n B_n$

Normalized color space is defined as $R_n = R/I$, $G_n = G/I$, $B_n = B/I$, wher R, G, B are standard color channels and I is image intensity.

Edges

To find edges use matlab function `edge` with canny detector. A pixel is an edge pixel if it is an edge in at least one channel of $R_n G_n B_n$.

Classification

Database evaluation

Compute the features for all images in the database (excluding the Test folder). Determine the median values for each feature for the paintings and photographs. Use the mean of these values as decision threshold for classification.

Classification criterion

A loaded image is considered to be a photograph if at least two features are on the photograph side of the threshold. It is painting otherwise.

Normalization

Do not forget to normalize the features.

Submission

Submission

Submit the modified/created m-files in a zip with name 'surname.zip'. Send it to kocurvik@gmail.com with subject 'PV - DU1'. Deadline is 7.11. at 13:10. You can get 10 point. Every day of late submission is penalized by two points.

Editing GUI

In case you modify main.m, main.fig or load_database.m, you have to write an explanation in the body of the e-mail as to why it was necessary. If you do so please at least keep the inputs and outputs for is_photograph.m and compute_thresholds.m the same.