

MCA Assignment [HW-1] Image Retrieval

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Question1a

The distance chosen to calculate the probabilities of the same colours were $d = 1,5$. Only two distances were chosen along with a grayscale image due to time constraints and computing power limitations.

Both the probabilities were stored in two separate folders with a pickle file for each image. While retrieval, these pickle files were accessed and used in similarity function. Top 105 image results were used as predicted result to calculate precision-recall and f1 score with the given ground truth for the queries.

Attached below are the obtained results:

```
train
  Precision
    Minimum Precision = 0.0
    Maximum Precision = 28.571428571428573
    Average Precision = 4.1269841269841265
  Recall
    Minimum Recall = 0.0
    Maximum Recall = 100.0
    Average Recall = 37.01969414908974
  F1
    Minimum F1 score = -1
    Maximum F1 score = 27.149321266968325
    Average F1 score = 5.937064694108956

  Avg time required for retrieval = 2.228734709999778

Avg percentage of queries for good = 37.188709982827625
Avg percentage of queries for ok = 32.446535538508336
Avg percentage of queries for junk = 41.42383692593325
```

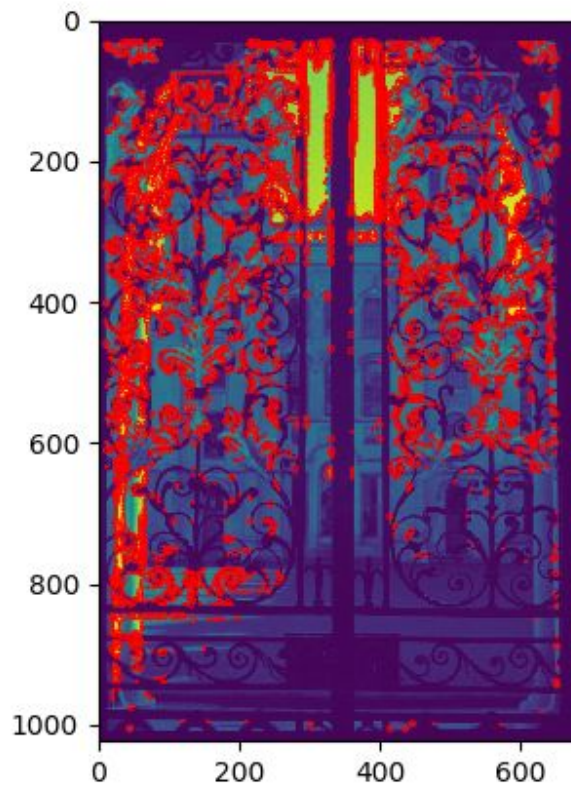
Question1b

LoG was implemented with help of “cv2.GaussianBlur” and “ cv2.Laplacian” with sigma values of $(\sqrt{2})^{(1 \text{ to } 5)}$ and then the maximum of those were considered to be interest points.

Due to complexity constraints, few pixels were skipped at regular intervals but the effect was negligible and the threshold was set high.

Finally, the x,y and sigma were saved as JSON for each image in a separate folder which can be used to plot interest points on the given image.

All 5063 JSON files are zipped in the submission.



Question1c

Similar to partB, we used the same techniques along with a new function “hessian_matrix_det” which was imported from “skimage.feature”.

Due to time constraints, first 1290 pictures JSON were saved for Surf but the same code can be extended to continue the blob detection on rest.

EXAMPLE

