



Master in Computer Vision Barcelona

Project
Module 1

Content based image retrieval

Coordination:

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Week 5

W4 Homework

Query results evaluation

QST1

Query results for QST1

Team	Method	map@1	map@5
Team5	method1	0.89	0.89
Team8	method1	0.80	0.80
Team4	method1	0.70	0.70
Team9	method1	0.66	0.69
Team2	method1	0.59	0.60
Team1	method1	0.47	0.49
Team7	method1	0.44	0.46

Updated 2022/11/13 after correcting W4 GT
(one wrong correspondence)

2021 results

Team	method1	map@1
Team4	method1	0.803
Team2	method1	0.689
Team5	method1	0.656
Team7	method1	0.656
Team6	method1	0.607
Team8	method1	0.377
Team3	method1	0.164
Team1	method1	0.000

W4 Homework

Query results evaluation

None

Query results (no augmentation): QST1

Team	Method	map@1	map@5
Team5	method1	0.83	0.83
Team9	method1	0.83	0.85
Team8	method1	0.79	0.79
Team4	method1	0.71	0.71
Team1	method1	0.62	0.62
Team2	method1	0.62	0.65
Team7	method1	0.50	0.51

Noise

Query results (noise): QST1

Team	Method	map@1	map@5
Team5	method1	0.85	0.85
Team8	method1	0.85	0.85
Team2	method1	0.46	0.46
Team4	method1	0.46	0.46
Team9	method1	0.39	0.46
Team7	method1	0.31	0.33
Team1	method1	0.23	0.23

Color changes

Query results (color changes): QST1

Team	Method	map@1	map@5
Team5	method1	0.96	0.96
Team4	method1	0.83	0.83
Team8	method1	0.79	0.79
Team2	method1	0.62	0.62
Team9	method1	0.62	0.65
Team1	method1	0.46	0.49
Team7	method1	0.46	0.48

Updated 2022/11/13 after correcting W4 GT
(one wrong correspondence)

W4 Homework

Query results evaluation

QST1

Text evaluation

Text distance: QST1

Team	Method	Avg Text Dist	Total lines	Checked lines
Team5	method1	0.70	61	53
Team8	method1	2.11	61	54
Team4	method1	4.37	61	57
Team9	method1	5.00	61	60
Team1	method1	5.07	61	43
Team7	method1	5.79	61	48
Team2	method1	43.10	61	61

W5 Datasets

Museum datasets

- [Can Framis Museum](#)
- [Figuera 120 years expo](#)
- [Kode Bergen](#)



Query dataset (development with GT and test without GT)

- Original and paintings with
 - superimposed text on a semitransparent box (painter name, different fonts, sizes and positions)
 - noise (some random samples)
 - color changes (some random samples, random Hue changes)
 - the query set can contain images not in the database
 - **multiple queries (1, 2 or 3 paintings, horizontal or vertical)**
 - **paintings may be rotated**
- QSD1-W3 (30) / QST1-W5 (30)

W5 - Tasks

- Given the museum and the query dataset. For each image in the query dataset, retrieve the K most similar images in the Museum dataset, ordered by score

Task 1: remove background (optional), detect lines and crop images, rotate images if necessary

Task 2: For each query image, retrieve the k most similar images in the museum dataset, ordered by score. Find correspondences using your best descriptors from previous weeks

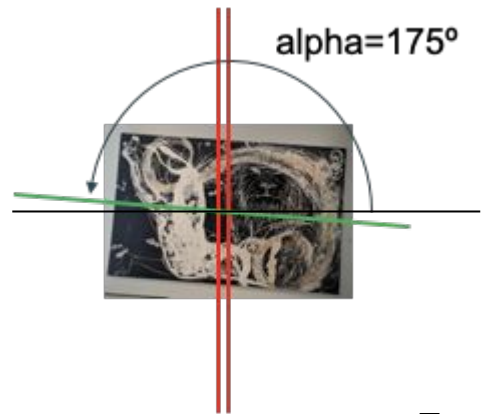
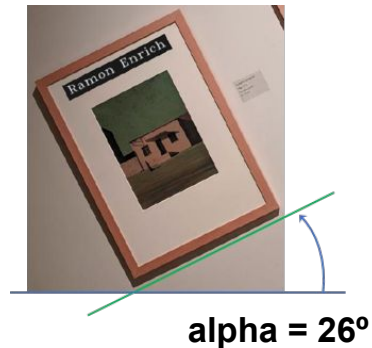
Task 3: Evaluate the system on QSD1-W5, $\text{map}@k$ ($k=1, k=5$)

Task 4: Organize an exhibition of museum paintings: distribute paintings in rooms

W5 - Task 1

- Image crop and rotation
 - Detect painting frame (lines, Hough...)
 - Compute painting orientation. Rotate image if necessary
 - Compute bounding box of detected (and rotated) painting
 - Crop painting
- Estimated bbox coordinates and angle will be evaluated

Computing angle: take two lower corners of the rectangle, determine line between them, compute angle in degrees in the interval $[0, 180]$



W5 - Task 2

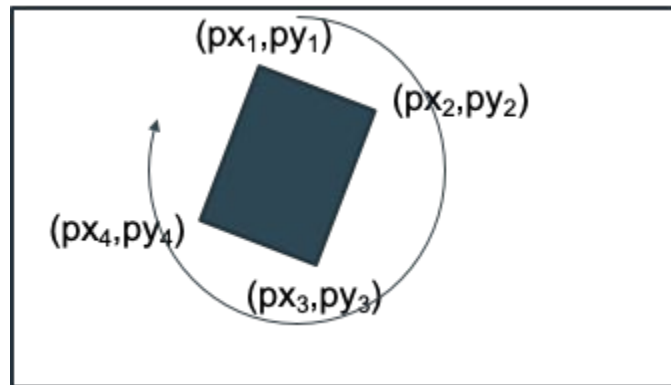
- For each query image, retrieve the k most similar images in the museum dataset ordered by score.
- You can use any of the descriptors from previous weeks (keypoints and local descriptors, descriptors based in color, texture or text, or any combination)
- There may be query paintings without corresponding paintings in the museum dataset

W5 - Task 3

Evaluate system on QSD1-W5:

- Return the top k images (highest score, lowest distance)
 - Evaluation with MAP@k (Mean Average precision at K)
- Return angle and coordinates of the frame bounding box for all the images in the query dataset
 - Evaluation: Mean IoU, Mean angular error
- $[[[\alpha_1, [(px_1, py_1), (px_2, py_2), (px_3, py_3), (px_4, py_4)]_1], \dots, [\alpha_N, [(px_1, py_1), (px_2, py_2), (px_3, py_3), (px_4, py_4)]_N]], [[\dots], \dots, [\dots]]] \rightarrow \text{frames.pkl}$

The choice of the starting point is not important



W5 - Task 4

- You are the museum curator, and you want to organize an exhibition with all pictures from the museum collection. There are 5 rooms.
- You need to cluster pictures (criterion to be defined) into 5 clusters, and select the 5 most representative pictures from each cluster. You can use **any procedure**.
- Criteria might be: dominant color, brightness, texture, mood (sad / happy / crazy / zen pictures), ...
- **Subjective evaluation.**

W5 - Submissions

- For each query, a list of the K best results (K=10).
 - **[-1] if ima not in dataset**
 - Only best method!
- Return a list where, for each query image, there is a list of lists with the angle and bbox of each painting in the query.

$[[[\alpha_1, [(px_1, py_1), (px_2, py_2), (px_3, py_3), (px_4, py_4)]_1], \dots, [\alpha_N, [(px_1, py_1), (px_2, py_2), (px_3, py_3), (px_4, py_4)]_N]], [[\dots], \dots, [\dots]]]$

Note: Deliver files to:

/home/dlcv0X/m1-results/week5/QST1/**method1**/result.pkl

/home/dlcv0X/m1-results/week5/QST1/**method1**/frames.pkl

/home/dlcv0X/m1-results/week5/QST1/**method1**/*.txt

- Clustering results presented in the week slides. Show the 5 most representative paintings for each room
- Tests sets will be delivered on Sunday 13 Nov 2022 at 14h
- Submit presentation slides
 - **Deadline results: Sunday 13 Nov 2022 at 19:00**
 - **Deadline slides: Sunday 13 Nov 2022 at 19:00**

W5 - Written report

- Deadline: 18/11/2022
- Templates:
 - Overleaf latex template for the report
<https://www.overleaf.com/latex/templates/preparation-of-papers-for-ieee-sponsored-conferences-and-symposia/zfnqfzzzxghk>
- The paper should be between four and five pages (2 columns) including tables, images and references, and should summarize the work and results of your project
- You are free to decide how to organize and structure the document (week by week or in any other order). Please, remember to include also a discussion of results, findings, and conclusions.

W5 - Oral presentation guidelines

- 10 minutes per team to present (all team members must participate)
- 5 minutes for Q&A (from any team and professors)
- Prepare an effective display:
 - include team ID and members' names to help assessment
 - keep it simple / readable / don't fill up the slide / number pages
- Presentation:
 - adapt the speech to the audience (they know the problem, do not repeat introduction)
 - look at the audience
 - speak slowly, clearly and loudly
 - time your talk: do not rush
 - **practice, practice, practice**
 - prepare possible questions

W5 Homework

W5 Query results evaluation

Query results for QST1

Team	Method	map@1	map@5
Team5	method1	0.86	0.86
Team9	method1	0.86	0.87
Team8	method1	0.73	0.74
Team4	method1	0.64	0.67
Team7	method1	0.64	0.66
Team1	method1	0.62	0.62
Team2	method1	0.48	0.49

Angular Error: QST1

Team	Method	mAE	mIoU
Team7	method1	2.21	0.90
Team2	method1	2.23	0.85
Team8	method1	2.32	0.89
Team9	method1	2.40	0.89
Team5	method1	2.44	0.88
Team4	method1	2.52	0.89
Team1	method1	3.22	0.87

Text distance: QST1

Team	Method	mTD	Total lines	Checked lines
Team5	method1	0.81	64	48
Team8	method1	2.00	64	56
Team1	method1	3.64	64	47
Team4	method1	3.83	64	64
Team9	method1	4.32	64	63
Team7	method1	6.75	64	53
Team2	method1	13.95	64	62

2021 results

Team	Method	map@1	MAE	mIoU	MTD
Team4	method1	0.859	2.376	0.813	3.42
Team7	method1	0.734	2.298	0.900	5.66
Team2	method1	0.578	3.541	0.586	
Team1	method1	0.562	2.584	0.852	7.41
Team6	method1	0.531	2.262	0.588	9.26
Team8	method1	0.531	84.147	0.398	6.84
Team5	method1	0.516	49.264	0.907	6.79
Team3	method1	0.344	4.886	0.853	3.31

mAE = Mean Angular Error
mIoU = Mean IoU
mTD = Mean Text Distance