

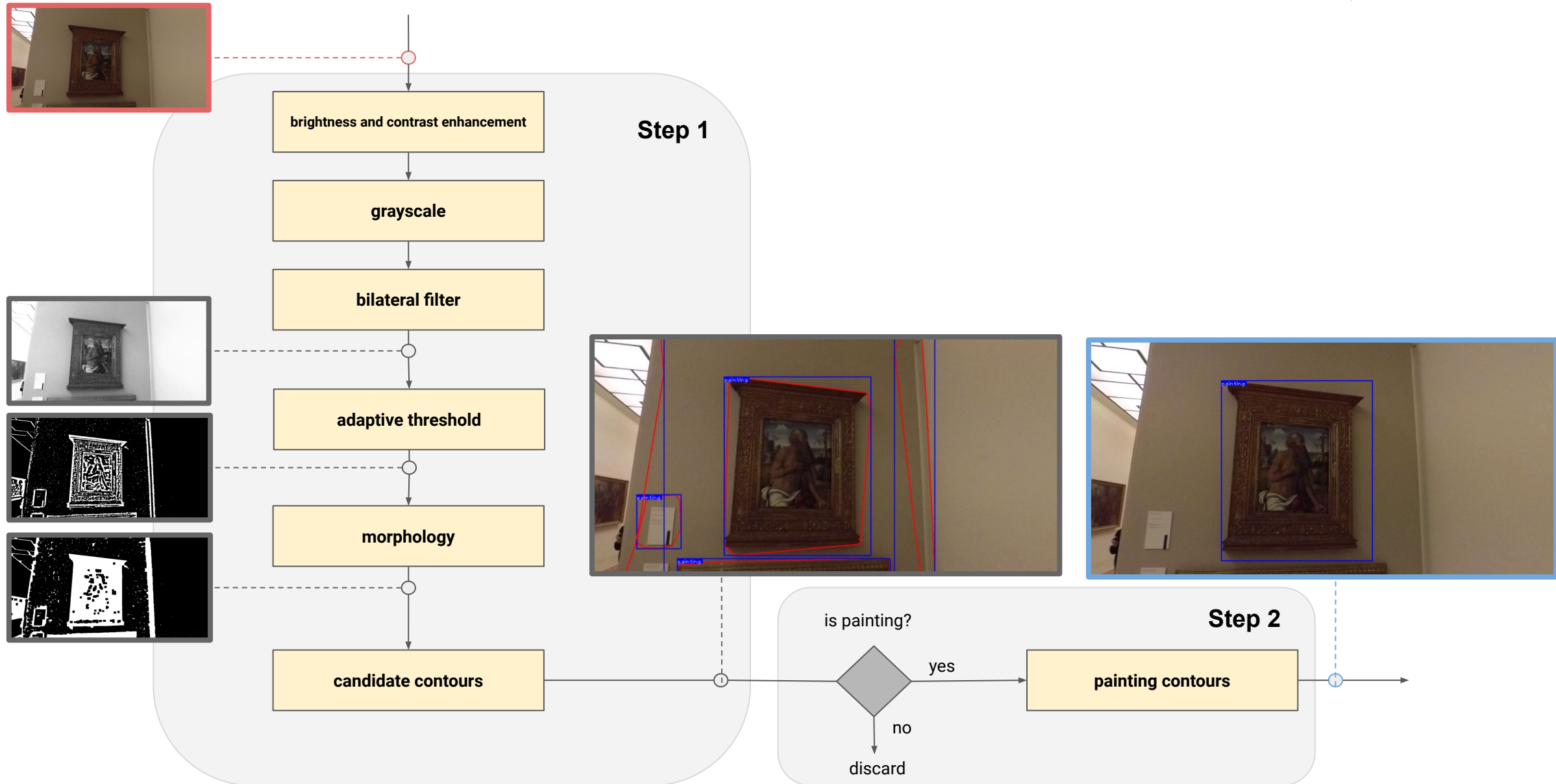
Vision and Cognitive Systems

Project for Gallerie Estensi Museum

Group n. 26

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Vitto

Painting detection



Painting detection - Is it a painting?

Shape

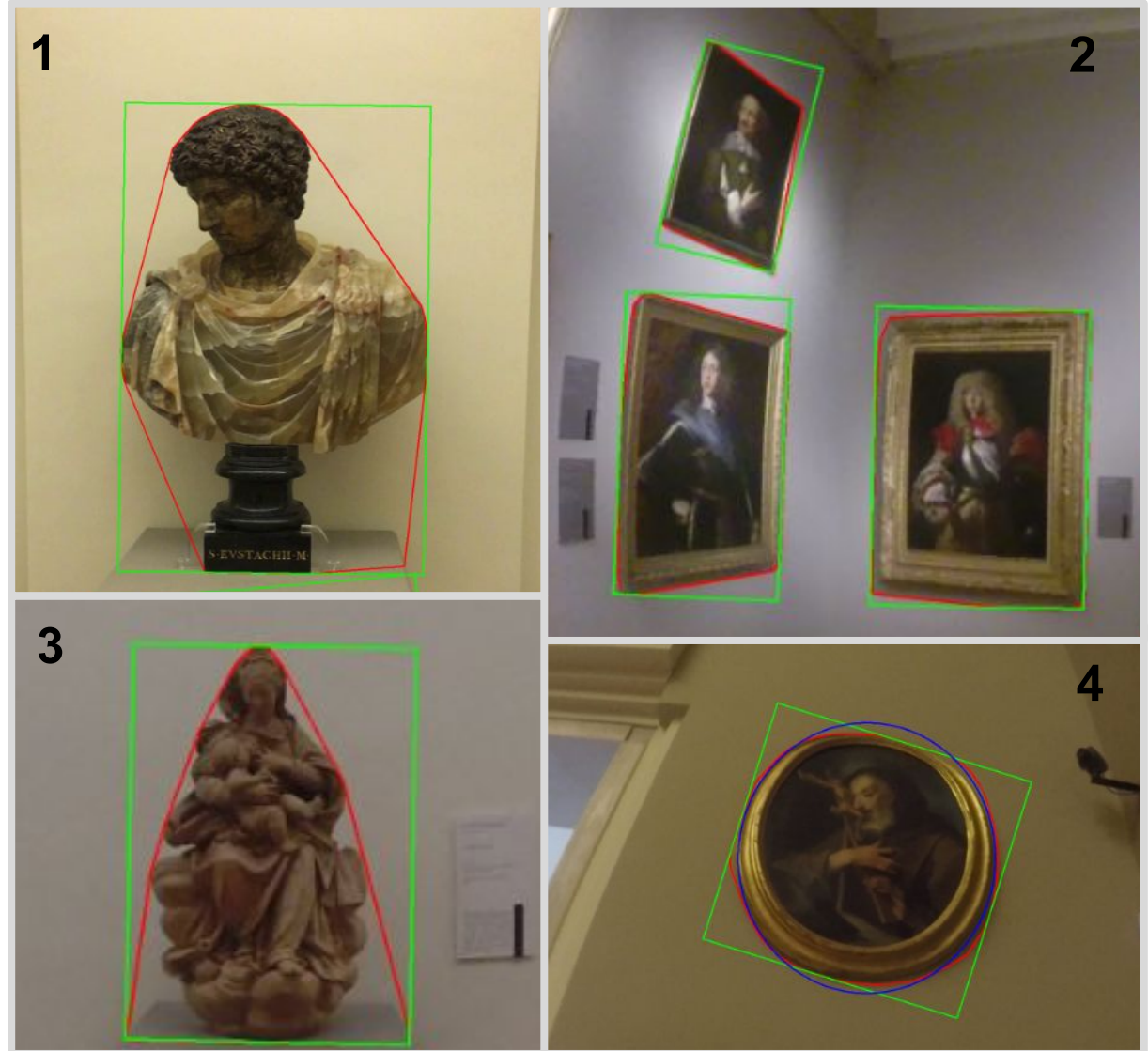
- Number of points
- Aspect ratio

Appearance

- Histogram variance
- Brightness

Area

- Rotated box (1-2-3)
- Ellipse (4)
- Convex hull



Painting detection evaluation

Without checks

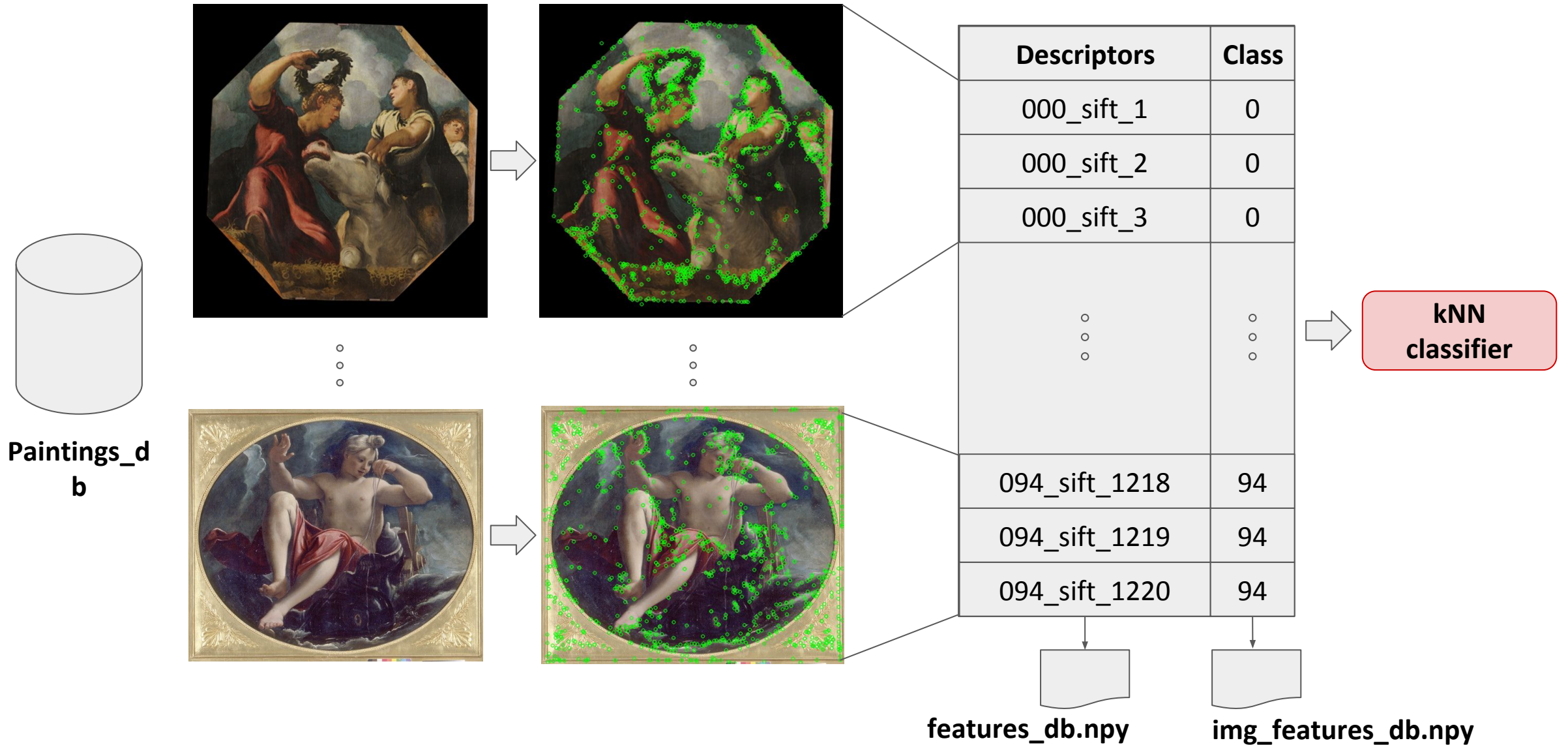
Video	TP	FP	FN	TN	P	R	F1
000	49	17587	19	0	0	0.72	
001	97	2849	2	0	0.03	0.98	
002	141	3850	12	0	0.04	0.92	
003	127	6636	25	0	0.02	0.84	
004	0	1738	0	0	0	1	
005	17	18195	0	0	0	1	
006	17	1320	0	0	0.01	1	
007	9	6466	0	0	0	1	
008	67	1039	11	0	0.06	0.86	
009	65	3071	7	0	0.02	0.9	
010	42	972	21	0	0.04	0.67	
012	20	4496	0	0	0	1	
013	49	2074	1	0	0.02	0.98	
014	92	632	0	0	0.13	1	
Total					0.03	0.92	0.05

With checks

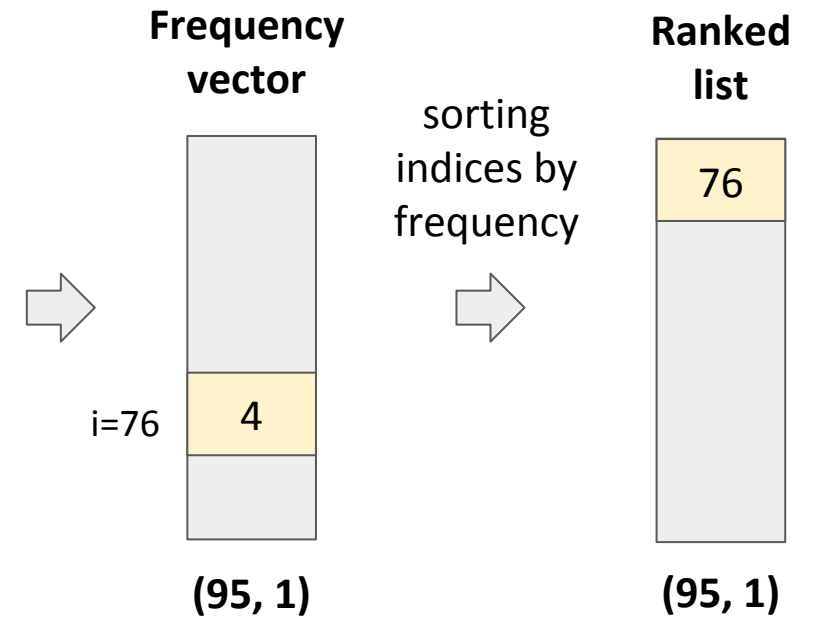
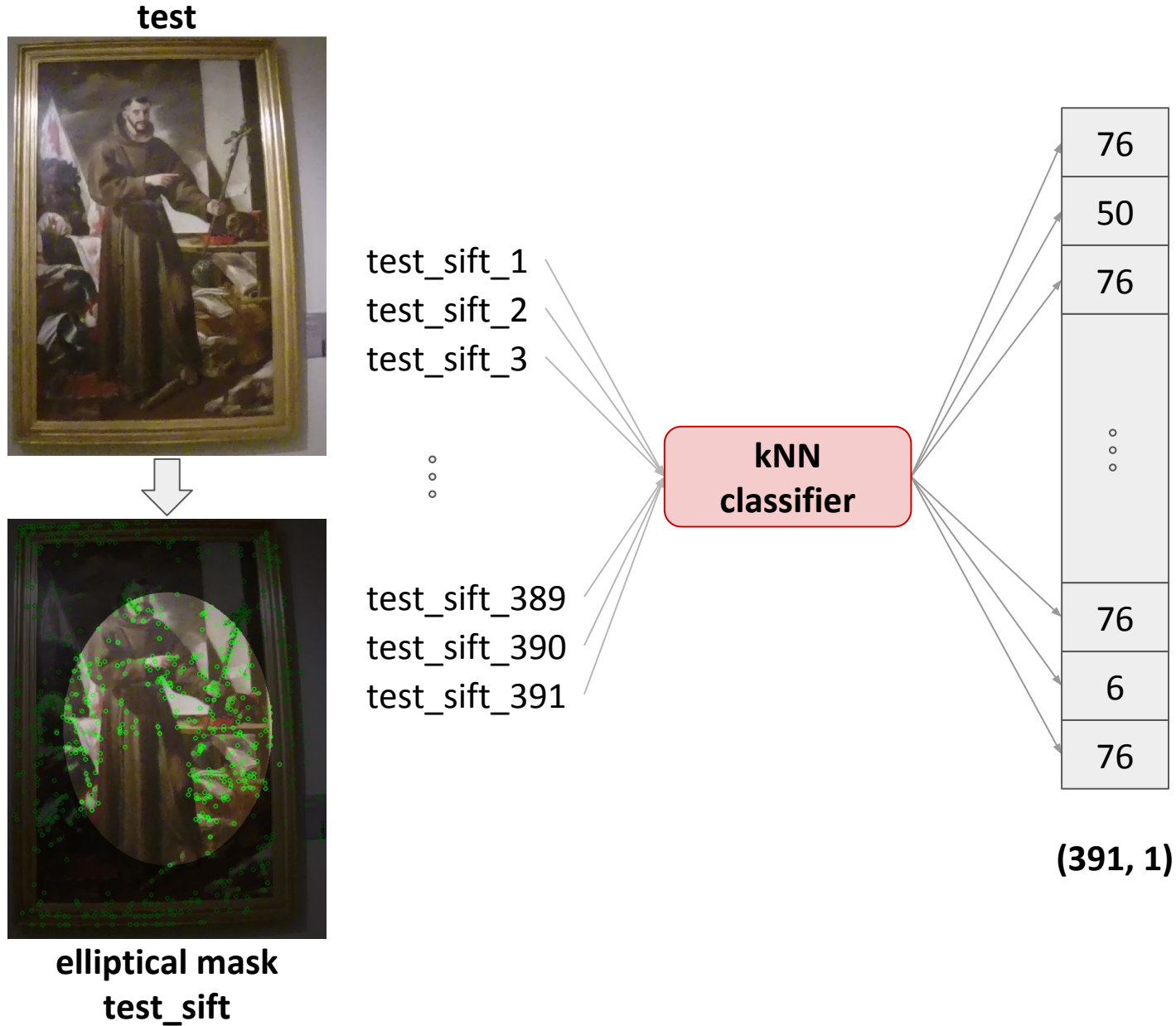
Video	TP	FP	FN	TN	P	R	F1
000	39	8	29	0	0.83	0.57	
001	73	5	26	0	0.94	0.74	
002	106	10	47	0	0.91	0.69	
003	85	4	67	0	0.96	0.56	
004	0	0	0	0	1	1	
005	11	1	6	0	0.92	0.65	
006	16	0	1	0	1	0.94	
007	6	0	3	0	1	0.67	
008	61	0	17	0	1	0.78	
009	45	7	27	0	0.87	0.62	
010	29	5	34	0	0.85	0.46	
012	16	0	4	0	1	0.8	
013	30	7	20	0	0.81	0.6	
014	76	6	16	0	0.93	0.83	
Total					0.93	0.71	0.8

- 23%

Painting retrieval (train)



Painting retrieval (test)



Painting retrieval (test)

test



SIFT matching



Ranked
list

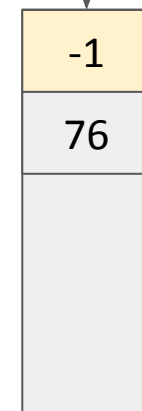
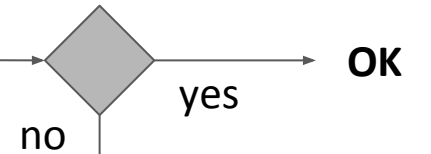


top 1



076.png

#matches > TH



Ranked
list

Painting retrieval evaluation

Video	Precision		
	w/ EM	w/o EM	Classification
000	-1	-1	1
001	0.06	0.01	0.03
002	0.84	0.9	0.86
003	0.93	0.93	0.99
004	-1	-1	-1
005	0.63	0.09	0.09
006	-1	-1	1
007	-1	-1	1
008	0.39	0.19	0.2
009	1	0.75	0.96
010	0.85	0.87	0.76
012	-1	-1	1
013	-1	-1	1
014	-1	-1	1
Total	0.67	0.53	0.76



+ 26%

Painting rectification

RANK1 != -1

yes

SIFT points

no

Vertex
points

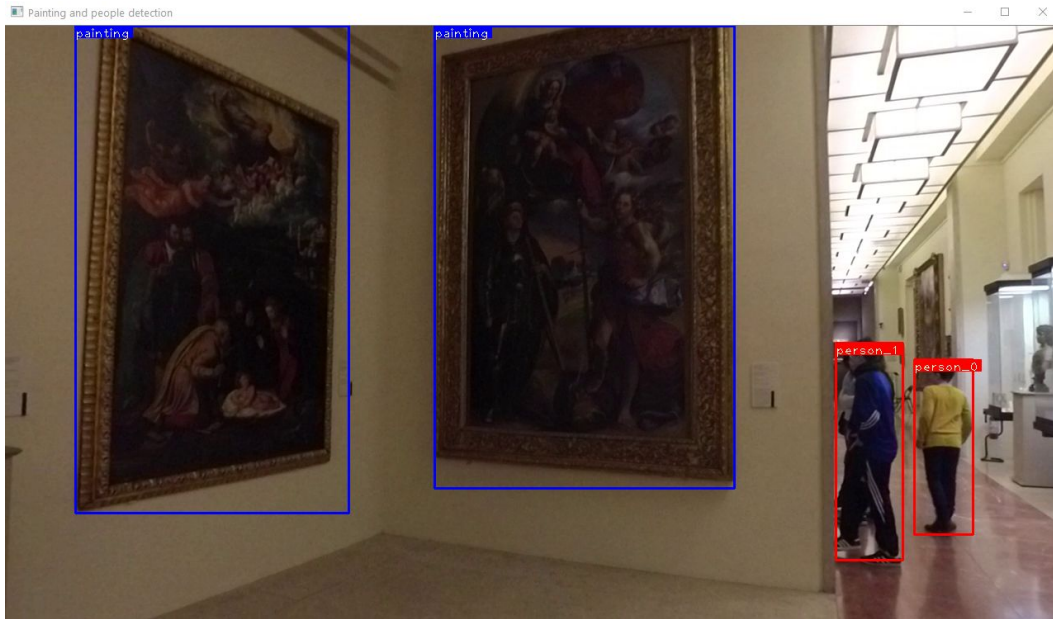
-1

76

Ranked
list

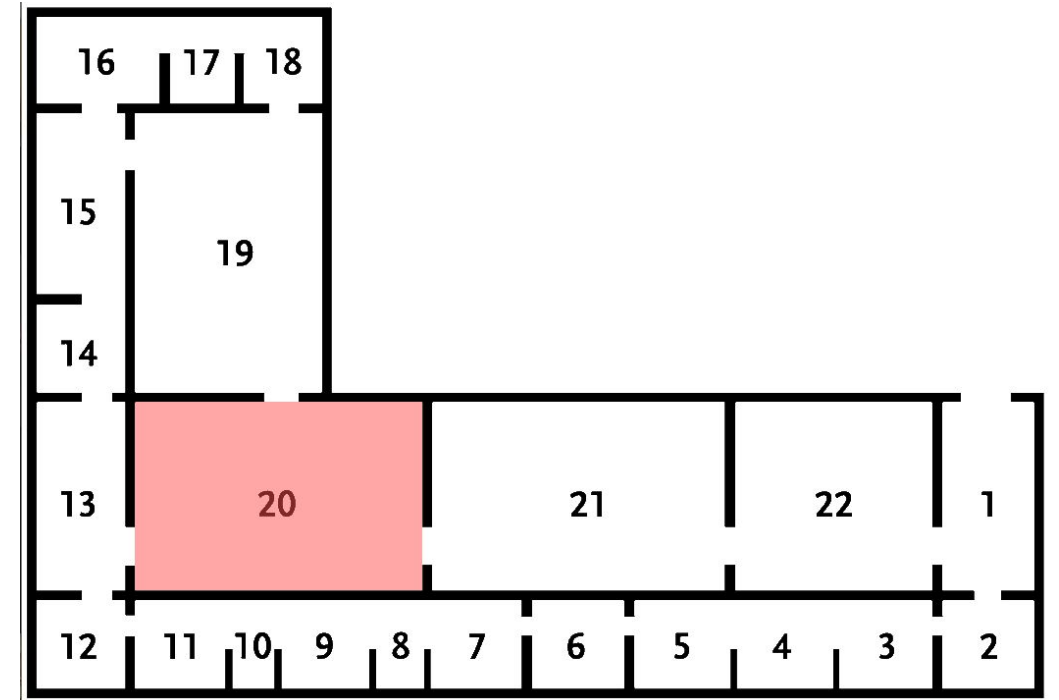


People detection and localization



- Retrieve paintings
- Lookup in data.csv
- Voting on room number

- YOLOv3 pre-trained
- Threshold confidence
- Remove people inside paintings



Demo

