Multimedia Data Formats

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Compression

- ImageMagick
- JXRLIB

FeatureDetectors

- vlfeat
  - SIFT
  - PHOW(DSIFT)
- opencv
  - SURF
  - ORB

Benchmark

- VLBENCHMARK

Dataset

Oxford Buildings Dataset

- 5062 images
- compressed loss-less or with minimal loss in JPEG
- collected from Flickr by searching for particular Oxford landmarks
- manually annotated to generate ground truth for 11 different landmarks
- 5 queries per landmark
- total of 55 queries

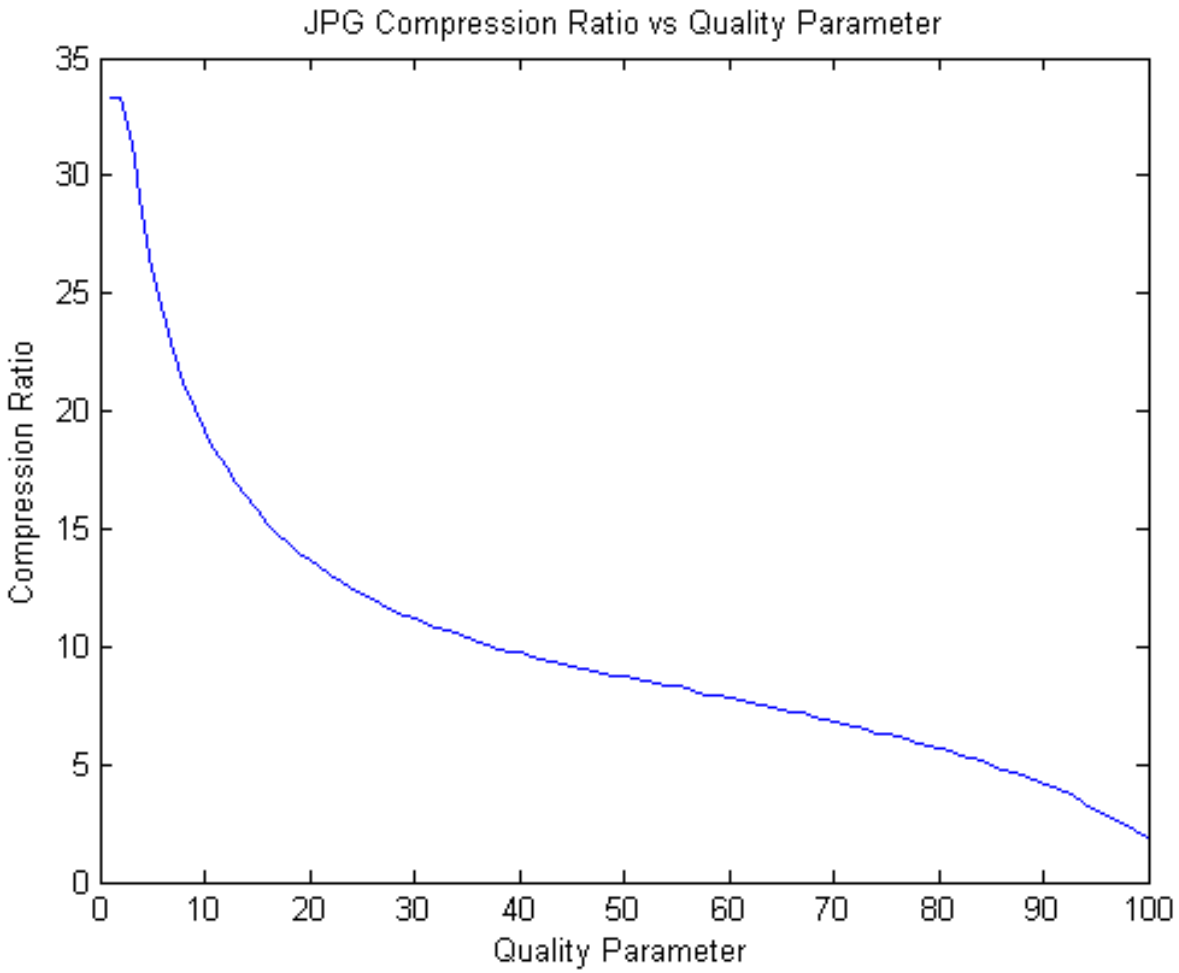
Random sampled subsets to limit compression and benchmark speed!

Estimate Compression Ratio

t

s : avg size $= 391.659$ bytes.
p : avg pixels $= 765.969$ pixel.
bpp : byte per pixel $= 3$.
r : avg raw size $= p * bpp = 2297908$.
e : estimated ratio $= r/s = 5.867$.

$$\textbf{Estimated Compressionratio} = \tag{1}$$


JPG Compression Ratio vs Quality Parameter
Compression Ratio
Quality Parameter
0
5
10
15
20
25
30
35
0
10
20
30
40
50
60
70
80
90
100

Queries

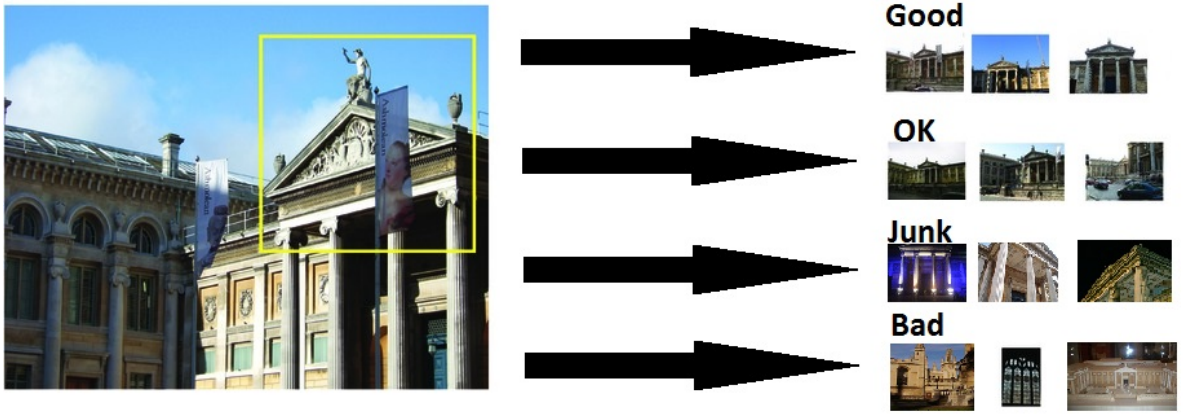
The query consists of a reference image and 4 query sets:

good A nice, clear picture of the object

ok More than 25% of the object is clearly visible.

junk Junk Less than 25% of the object is visible, or there are very high levels of occlusion or distortion.

bad Object not present



now similarity

between these image is measured

Generic Local Feature Extractor

Local Feature Frames

- search image for interest points
- define a frame for that point(points,circles,elipses)

Descriptor

- compute descriptor using the frame

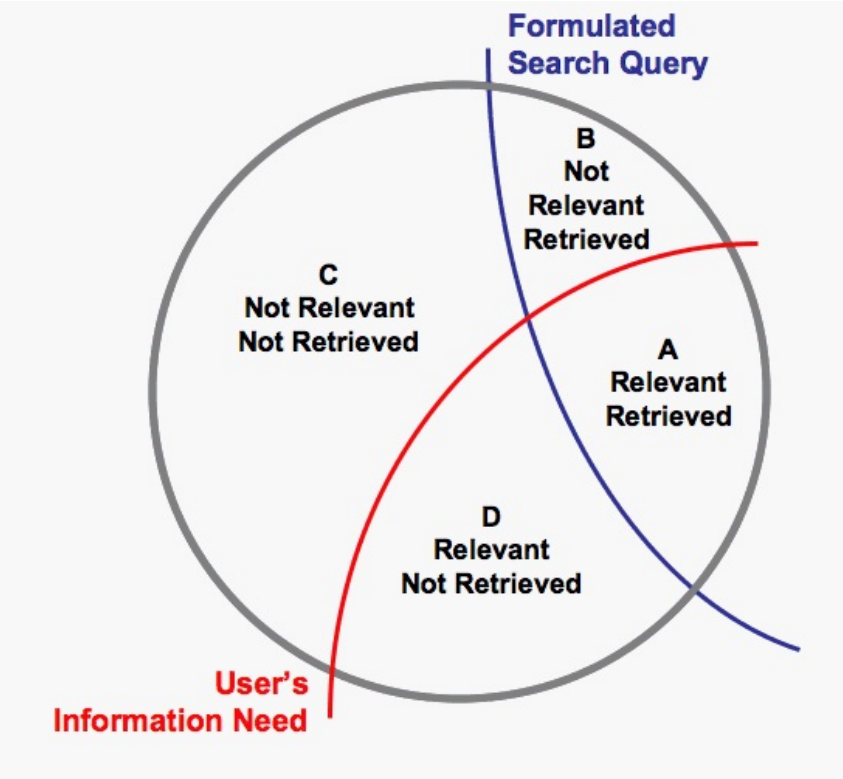
So we got n frames and n descriptors

Retrieval System

Ranking

- calculate KNN for the every reference descriptor
- vote with descriptor distance for the image
- normalize
- sort images after voting

Recall Precision



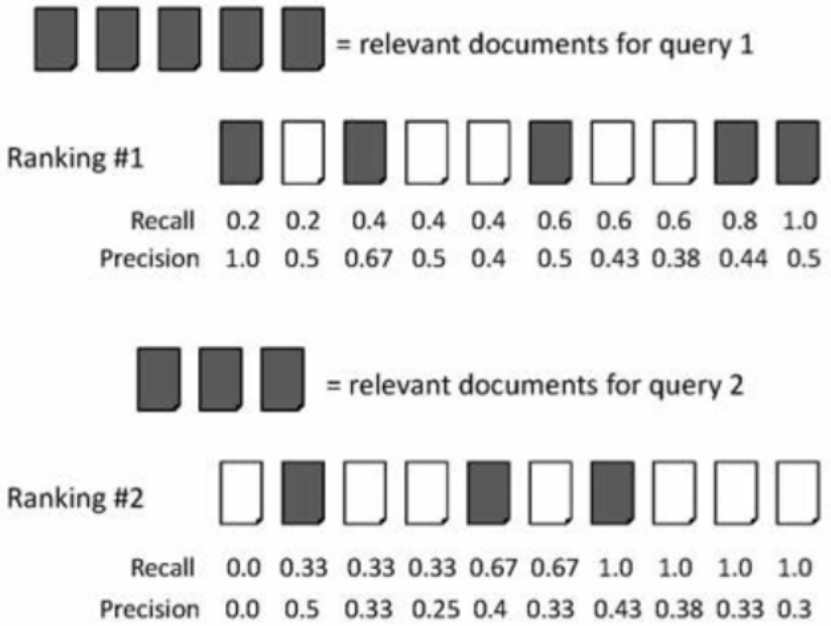
Metrics for Measuring Classification Quality

Point of View – Class 1

	Gold Class 1	Gold Class 2
Observed Class 1	TP	FP
Observed Class 2	FN	TN

$$\text{Precision} = \frac{tp}{tp + fp} \qquad \text{Recall} = \frac{tp}{tp + fn}$$

Mean Average Precision



$$average\ precision\ query\ 1 = (1.0 + 0.67 + 0.5 + 0.44 + 0.5)/5 = 0.62$$
$$average\ precision\ query\ 2 = (0.5 + 0.4 + 0.43)/3 = 0.44$$

$$mean\ average\ precision = (0.62 + 0.44)/2 = 0.53$$

Mean Average Precision add

How use the four query classes

- good and ok images are relevant
- junk will be ignored
- bad will count as wrong

Results

- plot of mAP over image file size
- plot query precision
- plot prc