

Technical sheet: ALEGORIA Benchmark

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1 Introduction

The ALEGORIA benchmark is a research dataset for evaluating computer vision algorithms. Consisting of multi-date, multi-sources images, with extensive annotations of classes and characteristics, its main theme is cultural, historical and geographical imagery. Classes are defined around an object or a location in urban or natural scenery. It is designed mainly for content-based image search, but can also be used in related tasks:

- Image-based geolocalization
- Cross-view image matching
- Invariant representation learning
- Few-shot landmark recognition
- Multi-temporal image matching

2 Content description

This section presents general statistics about the dataset, especially image contents and their sources.

2.1 General statistics

Item	Value
Number of images	13174
<i>of which annotated</i>	1858
<i>of which distractors (non annotated)</i>	11316
Number of classes	58
Min number of images per class	10
Max number of images per class	119
Mean number of images per class	32
Median number of images per class	25
Image file format	.jpg
Image dimension (width*height)	800px*variable

2.2 Sources

Three data providing institutions collaborated with us in the ALEGORIA project. Classes were built by finding common images in collections, and then completed with content from Google Images and Flickr (according to their licenses).

Item	Value
Number of annotated images	1858
<i>of which from Institut National de l'information Géographique et forestière</i>	711
<i>of which from Archives Nationales</i>	339
<i>of which from Nicéphore Niepce museum</i>	161
<i>of which from internet</i>	647
<i>of which source is unknown</i>	0
Number of distractors	11316
<i>of which from Institut National de l'information Géographique et forestière</i>	1260
<i>of which from Archives Nationales</i>	6701
<i>of which from Nicéphore Niepce museum</i>	2904
<i>of which from internet</i>	451

The data providers possess multiple collections. The Lapie collection is shared between musée Nicéphore Niepce and Archives Nationales.

Item	Value
Number of annotated images	1858
<i>of which from Henrard</i>	99
<i>of which from Lapie</i>	40
<i>of which from Combier</i>	7
<i>of which from MRU</i>	299
<i>of which from photothèque IGN</i>	711
<i>of which from internet</i>	702
Number of distractors	11316
<i>of which from Henrard</i>	935
<i>of which from Lapie</i>	4508
<i>of which from Combier</i>	1969
<i>of which from MRU</i>	2193
<i>of which from photothèque IGN</i>	1260
<i>of which from internet</i>	451

2.3 Content semantics

Each class is defined by taking as a reference an object or a zone that is partially or completely visible in all images of the class. There is a total of 58 classes. Classes include, independently of the target object, urban, semi-urban and natural sceneries.

Class definition	Number of classes	Number of images
Object	35	1290
<i>of which churches/cathedrals</i>	9	405
<i>of which castles</i>	3	167
<i>of which towers</i>	6	234
Area	23	671
<i>of which neighborhood/whole city</i>	14	452
Landscape	Number of classes	Number of images
Natural	5	133
Semi-urban	9	224
Urban	44	1501

Class name	urban/natural	class definition	class type
amiens	urban	tower	object
annecy	semi urban	lake mouth	zone
arc de triomphe	urban	monument	object
basilique sacre coeur	urban	church	object
biarritz	semi urban	hotel, beach	zone
amiral bruix boulevard	urban	crossroad	zone
bourg en bresse	semi urban	factory	object
brest	urban	port	zone
fourviere cathedral	urban	church	object
reims cathedral	urban	church	object
saint etienne de toul cathedral	urban	church	object
deauville international center	urban	hotel	object
charlevilles mezieres	urban	square	zone
chantilly castle	semi urban	castle	object
palace of versailles	urban	castle	object
choux creteil	urban	tower	object
cite internationale lyon	urban	neighborhood	zone
foix	semi urban	castle	object
gare du nord paris	urban	train station	object
gare est paris	urban	train station	object
gare perrache lyon	urban	train station	object
grenoble	urban	river	zone
guethary	natural	hotel	object
saint laurent hospital chalon	urban	hotel	object
nantes island	urban	neighborhood	zone
invalides	urban	hotel	object
issy moulineaux	urban	bridge	object
la madeleine paris	urban	monument	object
le havre	urban	tower	object
lery seyne sur mer	semi urban	church	object
macon	urban	bridge	object
mairie lille	urban	tower	object
chasseneuil memorial	natural	monument	object
mont blanc	natural	mountain	object
mont saint michel	natural	neighborhood	zone
neuilly sur seine	urban	neighborhood	zone
notre dame de lorette	natural	church	object
notre dame garde	urban	church	object
notre dame paris	urban	church	object
pantheon paris	urban	monument	object
picpus	urban	neighborhood	zone
place bourse bordeaux	square	square	zone
place marche clichy	urban	square	zone
bouc harbour	semi urban	harbor	zone
porte pantin	urban	neighborhood	zone
porte saint denis	urban	monument	object
aubepins neighborhood	urban	neighborhood	zone
reims racetrack	urban	neighborhood	zone
riom	urban	neighborhood (town)	zone
saint claude	semi urban	church	object
gerland stadium	urban	monument	object
st tropez	semi urban	neighborhood (town)	zone
toulon	urban	neighborhood	zone
eiffel tower	urban	tower	object
tours	urban	neighborhood	zone
aillaud towers nanterre	urban	tower	object
vannes	urban	neighborhood	zone
villa monceau	urban	neighborhood	zone

3 Annotations

This section presents statistics about the attribute distributions. Each image has been manually annotated along 7 different attributes quantized with values ranging from 0 to 2 or 3.

3.1 Attributes

Attribute	Value	Meaning
Scale	0	Very close - object covers majority of the picture
	1	Close - object covers around half of the picture
	2	Midrange - object is small but distinguishable
	3	Far - object is hardly distinguishable
Illumination	0	Underilluminated - object is too dark, details are difficult to distinguish
	1	Well illuminated - object is well illuminated, details are visible, contrast is good
	2	Over illuminated - object is too bright, details are difficult to distinguish
Vertical orientation	0	Vertical - object is seen from the top, viewing direction is perpendicular to the ground
	1	Oblique - object is seen from a plane or high viewpoint, top surface and side(s) are visible
	2	Street view - object is seen from ground level, top surface is not visible
Representation domain	0	Picture
	1	Drawing
	2	Schematic
	3	Digital
	4	Other
Occlusion	0	No occlusion - object is not hidden behind other objects
	1	Partially hidden
	2	Occluded - only a small portion of the object is visible through multiple and/or large occluding objects
Alterations	0	No alteration - picture is in perfect quality, object is in focus
	1	Minor alterations - some blur or mild degradation of the medium is visible, but doesn't impact understanding of the object
	2	Major alterations - picture is heavily degraded and/or blurry
Color	0	Color picture
	1	Grayscale picture
	2	Monochrome picture - e.g. sepia
	3	Infrared picture

The attribute values have been as much as possible uniformized, prioritizing first vertical orientation then scale. There is however classes with skewed distributions, generally towards an over-represented value. The table below shows for each value of each attribute the maximum and minimum proportions that can be found in the same class.

Attribute	Value	Global proportion	Max proportion	Min proportion
Scale	0 - Very close	13%	35%	3%
	1 - Close	20%	60%	4%
	2 - Midrange	29%	77%	4%
	3 - Far	38%	100%	12%
Illumination	0 - Underilluminated	13%	36%	3%
	1 - Well illuminated	80%	100%	49%
	2 - Over illuminated	7%	51%	2%
Vertical orientation	0 - Vertical	33%	81%	8%
	1 - Oblique	38%	78%	3%
	2 - Street view	29%	52%	10%
Representation domain	0 - Picture	99%	100%	85%
	1 - Drawing	1%	15%	<1%
	2 - Schematic	<1%	<1%	<1%
	3 - Digital	<1%	<1%	<1%
	4 - Other	<1%	<1%	<1%
Occlusion	0 - No occlusion	76%	100%	50%
	1 - Partially hidden	20%	50%	3%
	2 - Occluded	5%	21%	3%
Alterations	0 - No alteration	69%	100%	22%
	1 - Minor	23%	59%	4%
	2 - Major	8%	36%	1 %
Color	0 - Color	39%	84%	5%
	1 - Grayscale	48%	92%	16%
	2 - Monochrome	13%	62%	3%
	3 - Infrared	<1%	6%	<1%