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# **clarifai Documentation**

*Release 2.6.2*

**Clarifai**

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## 1.1 Installation Guide

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**Note:** Generally, the python client works with Python 2.x and Python 3.x. But it is only tested against 2.7, 3.5, 3.6 and 3.7. Feel free to report any bugs you encounter in any other version.

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### 1.1.1 Install the package

You can install the latest stable clarifai using pip (which is the canonical way to install Python packages). To install using pip, run:

```
pip install clarifai --upgrade
```

You can also install directly from Github (though we recommend the previous approach):

```
pip install git+git://github.com/Clarifai/clarifai-python.git
```

### 1.1.2 Configuration

Generate your Clarifai API key [on the API keys page](<https://clarifai.com/developer/account/keys>). The client uses it for authentication.

You can use three methods to pass the API key to your client (if you use more than one, the first in the following precedence order will be used):

1. Pass it to the ClarifaiApp constructor through the `api_key` parameter.
2. Set it as the `CLARIFAI_API_KEY` environment variable.
3. Place it in the `.clarifai/config` file using the following command (see exceptions for Windows below):

```
$ ./scripts/clarifai config
CLARIFAI_API_KEY: []: *****YQEd
```

## Windows Users

For Windows users, running `./scripts/clarifai config` may fail when you try to configure the runtime environment. This is because Windows uses the file extension to determine executables and by default, file `clarifai` without file extension is non-executable. In order to run the command, you may want to launch it with the python interpreter.

```
C:\Python27\python.exe Scripts\clarifai config
CLARIFAI_API_KEY: []: *****YQEd
```

### 1.1.3 AWS Lambda Users

For AWS Lambda users, in order to use the library correctly, you are recommended to set an environmental variable `CLARIFAI_API_KEY` in the lambda function configuration, or “hardcode” the `api_key` parameter to the `ClarifaiApp` constructor.

## 1.2 Tutorial

Each of the examples below is a small independent code snippet within 10 lines that could work by copy and paste to a python source code file. By playing with them, you should be getting started with Clarifai API. For more information about the API, check the API Reference.

### 1.2.1 Predict Tutorial

#### Predict with Public Models

For more information on any of the public models, visit <https://clarifai.com/models>

```
from clarifai.rest import ClarifaiApp

app = ClarifaiApp()

#General model
model = app.models.get(model_id="aaa03c23b3724a16a56b629203edc62c")

response = model.predict_by_url(url='https://samples.clarifai.com/metro-north.jpg')

#Travel model
model = app.models.get(model_id='eee28c313d69466f836ab83287a54ed9')

response = model.predict_by_url(url='https://samples.clarifai.com/travel.jpg')

#Food model
model = app.models.get(model_id="bd367be194cf45149e75f01d59f77ba7")
```

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```
response = model.predict_by_url(url='https://samples.clarifai.com/food.jpg')

#NSFW model
model = app.models.get(model_id="e9576d86d2004ed1a38ba0cf39ecb4b1")

response = model.predict_by_url(url='https://samples.clarifai.com/nsfw.jpg')

#Apparel model
model = app.models.get(model_id="e0be3b9d6a454f0493ac3a30784001ff")

response = model.predict_by_url(url='https://samples.clarifai.com/apparel.jpg')

#Celebrity model
model = app.models.get(model_id="e466caa0619f444ab97497640cefc4dc")

response = model.predict_by_url(url='https://samples.clarifai.com/celebrity.jpg')

#Demographics model
model = app.models.get(model_id="c0c0ac362b03416da06ab3fa36fb58e3")

response = model.predict_by_url(url='https://samples.clarifai.com/demographics.jpg')

#Face Detection model
model = app.models.get(model_id="a403429f2ddf4b49b307e318f00e528b")

response = model.predict_by_url(url='https://portal.clarifai.com/developer/static/
↳images/model-samples/celeb-001.jpg')

#General Embedding model
model = app.models.get(model_id="bbb5f41425b8468d9b7a554ff10f8581")

response = model.predict_by_url(url='https://samples.clarifai.com/metro-north.jpg')

#Logo model
model = app.models.get(model_id="c443119bf2ed4da98487520d01a0b1e3")

response = model.predict_by_url(url='https://samples.clarifai.com/logo.jpg')

#Color model
model = app.models.get(model_id="eed0b6733a644cea07cf4c60f87ebb7")

response = model.predict_by_url(url='https://samples.clarifai.com/wedding.jpg')
```

## 1.2.2 Upload Images

```
1 from clarifai.rest import ClarifaiApp
2
```

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```
3 app = ClarifaiApp()
4
5 app.inputs.create_image_from_url(url='https://samples.clarifai.com/puppy.jpeg',
↳ concepts=['my puppy'])
6 app.inputs.create_image_from_url(url='https://samples.clarifai.com/wedding.jpg', not_
↳ concepts=['my puppy'])
```

### 1.2.3 Create a Model

---

**Note:** This assumes you follow through the tutorial and finished the “Upload Images” Otherwise you may not be able to create the model.

---

```
1 model = app.models.create(model_id="puppy", concepts=["my puppy"])
```

### 1.2.4 Train the Model

---

**Note:** This assumes you follow through the tutorial and finished the “Upload Images” and “Create a Model” to create a model. Otherwise you may not be able to train the model.

---

```
1 model.train()
```

### 1.2.5 Predict with Model

---

**Note:** This assumes you follow through the tutorial and finished the “Upload Images”, “Create a Model”, and “Train the Model”. Otherwise you may not be able to make predictions with the model.

---

```
1 from clarifai.rest import ClarifaiApp
2
3 app = ClarifaiApp()
4
5 model = app.models.get('puppy')
6 model.predict_by_url('https://samples.clarifai.com/metro-north.jpg')
```

### 1.2.6 Instantiate an Image

```
1 from clarifai.rest import Image as ClImage
2
3 # make an image with an url
4 img = ClImage(url='https://samples.clarifai.com/dog1.jpeg')
5
6 # make an image with a filename
7 img = ClImage(filename='/tmp/user/dog.jpg')
8
```

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```

9 # allow duplicate url
10 img = ClImage(url='https://samples.clarifai.com/dog1.jpeg', allow_dup_url=True)
11
12 # make an image with concepts
13 img = ClImage(url='https://samples.clarifai.com/dog1.jpeg', \
14             concepts=['cat', 'animal'])
15
16 # make an image with metadata
17 img = ClImage(url='https://samples.clarifai.com/dog1.jpeg', \
18             concepts=['cat', 'animal'], \
19             metadata={'id':123,
20                     'city':'New York'
21                     })

```

## 1.2.7 Bulk Import Images

If you have a large amount of images, you may not want to upload them one by one by calling `app.inputs.create_image_from_url('https://samples.clarifai.com/dog1.jpeg')`

Instead you may want to use the bulk import API.

---

**Note:** The max number images per batch is 128. If you have more than 128 images to upload, you may want to chunk them into 128 or less, and bulk import them batch by batch.

---

In order to use this, you have to instantiate `Image()` objects from various sources.

```

1 from clarifai.rest import ClarifaiApp
2 from clarifai.rest import Image as ClImage
3
4 # assume there are 100 urls in the list
5 images = []
6 for url in urls:
7     img = ClImage(url=url)
8     images.append(img)
9
10 app.inputs.bulk_create_images(images)

```

## 1.2.8 Search the Image

---

**Note:** This assumes you follow through the tutorial and finished the “Upload Images” Otherwise you may not be able to search

---

```

1 from clarifai.rest import ClarifaiApp
2
3 app = ClarifaiApp()
4
5 app.inputs.search_by_annotated_concepts(concept='my puppy')
6
7 app.inputs.search_by_predicted_concepts(concept='dog')
8

```

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```
9 app.inputs.search_by_image(url='https://samples.clarifai.com/dog1.jpeg')
10
11 app.inputs.search_by_metadata(metadata={'key': 'value'})
```

## 1.3 Basic Concepts

This page lists a few basic notions used in the Clarifai API.

### 1.3.1 Image

Image is a straightforward notion. It represents a picture in a digital format.

In the Clarifai API, an image could be represented by a url, a local filename, raw bytes of the image, or bytes encoded in base64. To construct a new Image object, use the Image() constructor.

### 1.3.2 Video

In the Clarifai API, Video is considered a sequence of frames where each frame represents one second of the video. This means that after running prediction, the models will return results for every second of the video.

Video is used similarly to Image. Video can be represented by a url, a local filename, raw bytes of the video, or bytes encoded in base64. To construct a new Video object, use the Video() constructor.

### 1.3.3 Input

Input is a more general notion; it can be either Image or Video. Input is used for uploading, prediction, search, etc.

Each Input has a unique ID and can be associated with Concepts.

### 1.3.4 Concept

Concept represents a word to associate with Inputs. Concept can be a concrete notion like “dog” or “cat”, or an abstract notion like “love”. All models of type *concept* return a set of Concepts in the prediction for the given Input. Each Concept has a unique ID, and a name (in the data science nomenclature also sometimes referred to as a label, or a tag).

### 1.3.5 Model

Model is a machine learning algorithm that takes Input, such as Image or Video, runs a prediction, and outputs the results. There are several types of models: Concept Model, Face Detection Model, Color Model, etc. They all return different types of results. For example, Concept Model returns associated Concepts for each Input, Face Detection Model returns the locations of faces, Color Model returns dominant colors, etc.

There are public (pre-defined) models you can use, and custom models that you train yourself with your own Inputs.

### 1.3.6 Custom models

Custom models must be of type *concept*.

When creating a custom model, you provide it with your Inputs and associated Concepts. After being trained, the model can predict what Concepts are associated with never-before-seen Inputs, together with probabilities for confidence of the prediction.

Models can also be evaluated for measuring their prediction capability.

### 1.3.7 Workflow

Workflow enables you to run prediction on Inputs using several Models in one request.

*Installation Guide* Install Clarifai python library

*Tutorial* Getting started with Clarifai API using python client

*Basic Concepts* Getting familiar with basic concepts used in Clarifai API

**contributing** Contributing with a pull request

## 1.4 API Reference

This is the API Reference documentation extracted from the source code.

### 1.4.1 Application

```
class clarifai.rest.client.ClarifaiApp(app_id=None, app_secret=None, base_url=None,
                                       api_key=None, quiet=True, log_level=None)
```

Clarifai Application Object

This is the entry point of the Clarifai Client API. With authentication to an application, you can access all the models, concepts, and inputs in this application through the attributes of this class.

To access the models: use `app.models`

To access the inputs: use `app.inputs`

To access the concepts: use `app.concepts`

```
wait_for_specific_input_uploads_to_finish(ids, max_wait=666666)
```

Block until the inputs with ids “ids” have status INPUT\_IMAGE\_DOWNLOAD\_SUCCESS. This will raise an error if they have other than INPUT\_IMAGE\_DOWNLOAD\_SUCCESS.

**Returns** None or ApiClientError

```
wait_until_inputs_delete_finish()
```

Block until a current inputs deletion operation finishes

The criteria for unblocking is 0 inputs returned from GET /inputs

**Returns** None

**wait\_until\_inputs\_upload\_finish** (*max\_wait=666666*)

Block until the inputs upload finishes

The criteria for unblocking is 0 “to\_process” inputs from GET /inputs/status

**Returns** None

**wait\_until\_models\_delete\_finish** ()

Block until the inputs deletion finishes

The criteria for unblocking is 0 models returned from GET /models

**Returns** None

## 1.4.2 Concepts

**class** clarifai.rest.client.**Concepts** (*api*)

**bulk\_create** (*concept\_ids, concept\_names=None*)

Bulk create concepts

When the concept name is not set, it will be set as the same as concept ID.

**Parameters**

- **concept\_ids** – a list of concept IDs, in sequence
- **concept\_names** – a list of corresponding concept names, in the same sequence

**Returns** A list of Concept objects

### Examples

```
>>> app.concepts.bulk_create(['id1', 'id2'], ['cute cat', 'cute dog'])
```

**bulk\_update** (*concept\_ids, concept\_names, action='overwrite'*)

Patch multiple concepts

**Parameters**

- **concept\_ids** – a list of concept IDs, in sequence
- **concept\_names** – a list of corresponding concept names, in the same sequence
- **action** – the type of update

**Returns** the new Concept object

### Examples

```
>>> app.concepts.bulk_update(concept_ids=['myid1', 'myid2'],
>>>                           concept_names=['name2', 'name3'])
```

**create** (*concept\_id, concept\_name=None*)

Create a new concept

**Parameters**

- **concept\_id** – concept ID, the unique identifier of the concept

- **concept\_name** – name of the concept. If name is not specified, it will be set to the same as the concept ID

**Returns** the new Concept object

**get** (*concept\_id*)

Get a concept by id

**Parameters** **concept\_id** – concept ID, the unique identifier of the concept

**Returns** If found, return the Concept object. Otherwise, return None

### Examples

```
>>> app.concepts.get('id')
```

**get\_all** ()

Get all concepts associated with the application

**Returns** all concepts in a generator function

**get\_by\_page** (*page=1, per\_page=20*)

get concept with pagination

**Parameters**

- **page** – page number
- **per\_page** – number of concepts to retrieve per page

**Returns** a list of Concept objects

### Examples

```
>>> for concept in app.concepts.get_by_page(2, 10):
>>>     print(concept.concept_id)
```

**search** (*term, lang=None*)

search concepts by concept name with wildcards

**Parameters**

- **term** – search term with wildcards allowed
- **lang** – language to search, if none is specified the default for the application will be used

**Returns** a generator function with all concepts pertaining to the search term

### Examples

```
>>> app.concepts.search('cat')
>>> # search for Chinese label name
>>> app.concepts.search(u'*', lang='zh')
```

**update** (*concept\_id, concept\_name, action='overwrite'*)

Patch concept

**Parameters**

- **concept\_id** – id of the concept
- **concept\_name** – the new name for the concept
- **action** – the action

**Returns** the new Concept object

### Examples

```
>>> app.concepts.update(concept_id='myid1', concept_name='new_concept_name2')
```

## 1.4.3 Inputs

**class** clarifai.rest.client.**Inputs** (*api*)

**add\_concepts** (*input\_id, concepts=None, not\_concepts=None*)

Add concepts for one input

This is just an alias of *merge\_concepts* for easier understanding when you try to add some new concepts to an image

#### Parameters

- **input\_id** – the unique ID of the input
- **concepts** – the list of concepts
- **not\_concepts** – the list of negative concepts

**Returns** an Input object

### Examples

```
>>> app.inputs.add_concepts('id', ['cat', 'kitty'], ['dog'])
```

**bulk\_create\_images** (*images*)

Create images in bulk

**Parameters** **images** – a list of Image objects

**Returns** a list of the Image objects that were just created

### Examples

```
>>> img1 = Image(url="", concepts=['cat', 'kitty'])
>>> img2 = Image(url="", concepts=['dog'], not_concepts=['cat'])
>>> app.inputs.bulk_create_images([img1, img2])
```

**bulk\_delete\_concepts** (*input\_ids, concept\_lists*)

bulk delete concepts from a list of input ids

#### Parameters

- **input\_ids** – a list of input IDs

- **concept\_lists** – a list of concept lists, each one corresponding to a listed input ID and
- **with concepts to be deleted from that input** (*filled*)–

**Returns** an Input object

### Examples

```
>>> app.inputs.bulk_delete_concepts(['id'], [['cat', 'dog']])
```

**bulk\_merge\_concepts** (*input\_ids, concept\_lists*)

bulk merge concepts from a list of input ids

#### Parameters

- **input\_ids** – a list of input IDs
- **concept\_lists** – a list of concept lists, each one corresponding to a listed input ID and
- **with concepts to be added to that input** (*filled*)–

**Returns** an Input object

### Examples

```
>>> app.inputs.bulk_merge_concepts('id', [['cat', True], ('dog', False)])
```

**bulk\_update** (*images, action='merge'*)

bulk\_update has been deprecated. Please use bulk\_update\_inputs.

**bulk\_update\_inputs** (*images, action='merge'*)

Update the input update the information of an input/image

#### Parameters

- **images** – a list of Image objects that have concepts, metadata, etc.
- **action** – one of ['merge', 'overwrite']  
 'merge' is to append the info onto the existing info, for either concept or metadata  
 'overwrite' is to overwrite the existing metadata and concepts with the existing ones

**Returns** an Image object

### Examples

```
>>> new_img1 = Image(image_id="abc1", concepts=['c1', 'c2'], not_concepts=['c3
↳'],
>>>                               metadata={'key':'val'})
>>> new_img2 = Image(image_id="abc2", concepts=['c1', 'c2'], not_concepts=['c3
↳'],
>>>                               metadata={'key':'val'})
>>> app.inputs.update([new_img1, new_img2], action='overwrite')
```

**check\_status** ()

check the input upload status

**Returns** InputCounts object

### Examples

```
>>> status = app.inputs.check_status()
>>> print(status.code)
>>> print(status.description)
```

**create\_image** (*image*)

create an image from Image object

**Parameters** *image* – a Clarifai Image object

**Returns** the Image object that just got created and uploaded

### Examples

```
>>> app.inputs.create_image(Image(url='https://samples.clarifai.com/metro-
↳north.jpg'))
```

**create\_image\_from\_base64** (*base64\_bytes*, *image\_id=None*, *concepts=None*,  
*not\_concepts=None*, *crop=None*, *metadata=None*, *geo=None*,  
*allow\_duplicate\_url=False*)

create an image by base64 bytes

#### Parameters

- **base64\_bytes** – base64 encoded image bytes
- **image\_id** – ID of the image
- **concepts** – a list of concept names this image is associated with
- **not\_concepts** – a list of concept names this image is not associated with
- **crop** – crop information, with four corner coordinates
- **metadata** – meta data with a dictionary
- **geo** – geo info with a dictionary
- **allow\_duplicate\_url** – True or False, the flag to allow a duplicate url to be imported

**Returns** the Image object that just got created and uploaded

### Examples

```
>>> app.inputs.create_image_bytes(base64_bytes="base64 encoded image bytes...
↳")
```

**create\_image\_from\_bytes** (*img\_bytes*, *image\_id=None*, *concepts=None*, *not\_concepts=None*,  
*crop=None*, *metadata=None*, *geo=None*, *al-*  
*low\_duplicate\_url=False*)

create an image by image bytes

#### Parameters

- **img\_bytes** – raw bytes of an image



- **image\_id** – ID of the image
- **concepts** – a list of concept names this image is associated with
- **not\_concepts** – a list of concept names this image is not associated with
- **crop** – crop information, with four corner coordinates
- **metadata** – meta data with a dictionary
- **geo** – geo info with a dictionary
- **allow\_duplicate\_url** – True or False, the flag to allow a duplicate url to be imported

**Returns** the Image object that just got created and uploaded

### Examples

```
>>> app.inputs.create_image_bytes(img_bytes="raw image bytes...")
```

**create\_image\_from\_filename** (*filename*, *image\_id=None*, *concepts=None*, *not\_concepts=None*, *crop=None*, *metadata=None*, *geo=None*, *allow\_duplicate\_url=False*)

create an image by local filename

#### Parameters

- **filename** – local filename
- **image\_id** – ID of the image
- **concepts** – a list of concept names this image is associated with
- **not\_concepts** – a list of concept names this image is not associated with
- **crop** – (deprecated) crop information, with four corner coordinates
- **metadata** – meta data with a dictionary
- **geo** – geo info with a dictionary
- **allow\_duplicate\_url** – True or False, the flag to allow a duplicate url to be imported

**Returns** the Image object that just got created and uploaded

### Examples

```
>>> app.inputs.create_image_filename(filename="a.jpeg")
```

**create\_image\_from\_url** (*url*, *image\_id=None*, *concepts=None*, *not\_concepts=None*, *crop=None*, *metadata=None*, *geo=None*, *allow\_duplicate\_url=False*)

create an image from Image url

#### Parameters

- **url** – image url
- **image\_id** – ID of the image
- **concepts** – a list of concept names this image is associated with

- **not\_concepts** – a list of concept names this image is not associated with
- **crop** – (deprecated) crop information, with four corner coordinates
- **metadata** – meta data with a dictionary
- **geo** – geo info with a dictionary
- **allow\_duplicate\_url** – True or False, the flag to allow a duplicate url to be imported

**Returns** the Image object that just got created and uploaded

### Examples

```
>>> app.inputs.create_image_from_url(url='https://samples.clarifai.com/metro-
↳north.jpg')
>>>
>>> # create image with geo point
>>> app.inputs.create_image_from_url(url='https://samples.clarifai.com/metro-
↳north.jpg',
>>>                                     geo=Geo(geo_point=GeoPoint(22.22, 44.44))
```

#### **delete** (*input\_id*)

delete an input with input ID

**Parameters** **input\_id** – the unique input ID

**Returns** ApiStatus object

### Examples

```
>>> ret = app.inputs.delete('idl')
>>> print(ret.code)
```

#### **delete\_all** ()

delete all inputs from the application

#### **delete\_concepts** (*input\_id, concepts*)

delete concepts from an input/image

##### **Parameters**

- **input\_id** – unique ID of the input
- **concepts** – a list of concept names

**Returns** an Image object

#### **get** (*input\_id*)

get an Input object by input ID

**Parameters** **input\_id** – the unique identifier of the input

**Returns** an Image/Input object

## Examples

```
>>> image = app.inputs.get('id1')
>>> print(image.input_id)
```

**get\_all** (*ignore\_error=False*)

Get all inputs

**Parameters** **ignore\_error** – ignore errored inputs. For example some images may fail to be imported due to bad url

**Returns** a generator function that yields Input objects

## Examples

```
>>> for image in app.inputs.get_all():
>>>     print(image.input_id)
```

**get\_by\_page** (*page=1, per\_page=20, ignore\_error=False*)

Get inputs with pagination

### Parameters

- **page** – page number
- **per\_page** – number of inputs to retrieve per page
- **ignore\_error** – ignore errored inputs. For example some images may fail to be imported due to bad url

**Returns** a list of Input objects

## Examples

```
>>> for image in app.inputs.get_by_page(2, 10):
>>>     print(image.input_id)
```

**merge\_concepts** (*input\_id, concepts=None, not\_concepts=None, overwrite=False*)

Merge concepts for one input

### Parameters

- **input\_id** – the unique ID of the input
- **concepts** – the list of concepts
- **not\_concepts** – the list of negative concepts
- **overwrite** – if True, this operation will replace the previous concepts. If False,
- **will append them.** (*it*) –

**Returns** an Input object

## Examples

```
>>> app.inputs.merge_concepts('id', ['cat', 'kitty'], ['dog'])
```

**merge\_metadata** (*input\_id, metadata*)  
merge metadata for the image

This is to merge/update the metadata of the given image

**Parameters**

- **input\_id** – the unique ID of the input
- **metadata** – the metadata dictionary

**Examples**

```
>>> # merge the metadata
>>> # metadata will be appended to the existing key/value pairs
>>> app.inputs.merge_metadata('id', {'key1':'value1', 'key2':'value2'})
```

**search** (*qb, page=1, per\_page=20, raw=False*)  
search with a clarifai image query builder

WARNING: this is the advanced search function. You will need to build a query builder in order to use this.

**There are a few simple search functions:** `search_by_annotated_concepts()`  
`search_by_predicted_concepts()` `search_by_image()` `search_by_metadata()`

**Parameters**

- **qb** – clarifai query builder
- **page** – the results page
- **per\_page** – results per page
- **raw** – whether to return the original JSON object instead of a list of Image objects

**Returns** a list of Input/Image object

**search\_by\_annotated\_concepts** (*concept=None, concepts=None, value=True, values=None, concept\_id=None, concept\_ids=None, page=1, per\_page=20, raw=False*)  
search using the concepts the user has manually specified

**Parameters**

- **concept** – concept name to search
- **concepts** – a list of concept name to search
- **concept\_id** – concept IDs to search
- **concept\_ids** – a list of concept IDs to search
- **value** – whether the concept should be a positive tag or negative
- **values** – the list of values corresponding to the concepts
- **page** – page number
- **per\_page** – number of images to return per page
- **raw** – raw result indicator

**Returns** a list of Image objects

## Examples

```
>>> app.inputs.search_by_annotated_concepts (concept='cat')
```

**search\_by\_geo** (*geo\_point=None, geo\_limit=None, geo\_box=None, page=1, per\_page=20, raw=False*)  
search by geo point and geo limit

### Parameters

- **geo\_point** – A GeoPoint object, which represents the (longitude, latitude) of a location
- **geo\_limit** – A GeoLimit object, which represents a range to a GeoPoint
- **geo\_box** – A GeoBox object, which represents a box area
- **page** – page number
- **per\_page** – number of images to return per page
- **raw** – raw result indicator

**Returns** a list of Image objects

## Examples

```
>>> app.inputs.search_by_geo(GeoPoint(30, 40), GeoLimit("mile", 10))
```

**search\_by\_image** (*image\_id=None, image=None, url=None, imgbytes=None, base64bytes=None, fileobj=None, filename=None, crop=None, page=1, per\_page=20, raw=False*)  
Search for visually similar images

By passing image\_id, raw image bytes, base64 encoded bytes, image file io stream, image filename, or Clarifai Image object, you can use the visual search power of the Clarifai API.

### Parameters

- **image\_id** – unique ID of the image for search
- **image** – Image object for search
- **imgbytes** – raw image bytes for search
- **base64bytes** – base63 encoded image bytes
- **fileobj** – file io stream, like open(file)
- **filename** – filename on local filesystem
- **crop** – crop of the image as a list of four floats representing the corner coordinates
- **page** – page number
- **per\_page** – number of images returned per page
- **raw** – raw result indicator

**Returns** a list of Image object

## Examples

```
>>> # search by image url
>>> app.inputs.search_by_image(url='http://blabla')
>>> # search by local filename
>>> app.inputs.search_by_image(filename='bla')
>>> # search by raw image bytes
>>> app.inputs.search_by_image(imgbytes='data')
>>> # search by base64 encoded image bytes
>>> app.inputs.search_by_image(base64bytes='data')
>>> # search by file stream io
>>> app.inputs.search_by_image(fileobj=open('file'))
```

**search\_by\_metadata** (*metadata, page=1, per\_page=20, raw=False*)  
search by meta data of the image rather than concept

#### Parameters

- **metadata** – a dictionary for meta data search. The dictionary could be a simple one with only one key and value, Or a nested dictionary with multi levels.
- **page** – page number
- **per\_page** – the number of images to return per page
- **raw** – raw result indicator

**Returns** a list of Image objects

#### Examples

```
>>> app.inputs.search_by_metadata(metadata={'name': 'bla'})
>>> app.inputs.search_by_metadata(metadata={'my_class1': { 'name' : 'bla' }})
```

**search\_by\_original\_url** (*url, page=1, per\_page=20, raw=False*)  
search by the original url of the uploaded images

#### Parameters

- **url** – url of the image
- **page** – page number
- **per\_page** – the number of images to return per page
- **raw** – raw result indicator

**Returns** a list of Image objects

#### Examples

```
>>> app.inputs.search_by_original_url(url='http://bla')
```

**search\_by\_predicted\_concepts** (*concept=None, concepts=None, value=True, values=None, concept\_id=None, concept\_ids=None, page=1, per\_page=20, lang=None, raw=False*)  
search over the predicted concepts

#### Parameters

- **concept** – concept name to search

- **concepts** – a list of concept names to search
- **concept\_id** – concept id to search
- **concept\_ids** – a list of concept ids to search
- **value** – whether the concept should be a positive tag or negative
- **values** – the list of values corresponding to the concepts
- **page** – page number
- **per\_page** – number of images to return per page
- **lang** – language to search over for translated concepts
- **raw** – raw result indicator

**Returns** a list of Image objects

### Examples

```
>>> app.inputs.search_by_predicted_concepts(concept='cat')
>>> # search over simplified Chinese label
>>> app.inputs.search_by_predicted_concepts(concept=u'', lang='zh')
```

**update** (*image*, *action='merge'*)

Update the information of an input/image

#### Parameters

- **image** – an Image object that has concepts, metadata, etc.
  - **action** – one of ['merge', 'overwrite']
- 'merge' is to append the info onto the existing info, for either concept or metadata
- 'overwrite' is to overwrite the existing metadata and concepts with the existing ones

**Returns** an Image object

### Examples

```
>>> new_img = Image(image_id="abc", concepts=['c1', 'c2'], not_concepts=['c3
↵'],
>>>                 metadata={'key':'val'})
>>> app.inputs.update(new_img, action='overwrite')
```

## 1.4.4 Models

**class** clarifai.rest.client.**Models** (*api*)

**bulk\_delete** (*model\_ids*)

Delete multiple models.

**Parameters** **model\_ids** – a list of unique IDs of the models to delete

**Returns** the raw JSON response from the server

## Examples

```
>>> app.models.delete_models(['model_id1', 'model_id2'])
```

### **clear\_model\_cache()**

clear model\_name -> model\_id cache

WARNING: This is an internal function, user should not call this

We cache model\_name to model\_id mapping for API efficiency. The first time you call a models.get() by name, the name to ID mapping is saved so next time there is no query. Then user does not have to query the model ID every time when they want to work on it.

**create** (*model\_id*, *model\_name=None*, *concepts=None*, *concepts\_mutually\_exclusive=False*, *closed\_environment=False*, *hyper\_parameters=None*)  
Create a new model

#### Parameters

- **model\_id** – ID of the model
- **model\_name** – optional name of the model
- **concepts** – optional concepts to be associated with this model
- **concepts\_mutually\_exclusive** – True or False, whether concepts are mutually exclusive
- **closed\_environment** – True or False, whether to use negatives for prediction
- **hyper\_parameters** – hyper parameters for the model, with a json object

**Returns** Model object

## Examples

```
>>> # create a model with no concepts
>>> app.models.create('my_model1')
>>> # create a model with a few concepts
>>> app.models.create('my_model2', concepts=['bird', 'fish'])
>>> # create a model with closed environment
>>> app.models.create('my_model3', closed_environment=True)
```

**delete** (*model\_id*, *version\_id=None*)

delete the model, or a specific version of the model

Without model version id specified, all the versions associated with this model will be deleted as well.

With model version id specified, it will delete a particular model version from the model

#### Parameters

- **model\_id** – the unique ID of the model
- **version\_id** – the unique ID of the model version

**Returns** the raw JSON response from the server



## Examples

```
>>> # delete a model
>>> app.models.delete('model_id1')
>>> # delete a model version
>>> app.models.delete('model_id1', version_id='version1')
```

### `delete_all()`

Delete all models and the versions associated with each one

After this operation, you will have no models in the application

**Returns** the raw JSON response from the server

## Examples

```
>>> app.models.delete_all()
```

### `get(model_name=None, model_id=None, model_type=None)`

Get a model, by ID or name

#### Parameters

- **model\_name** – name of the model
- **model\_id** – unique identifier of the model
- **model\_type** – type of the model

**Returns** the Model object

## Examples

```
>>> # get general model (id aaa03c23b3724a16a56b629203edc62c)
>>> app.models.get('aaa03c23b3724a16a56b629203edc62c')
```

### `get_all(public_only=False, private_only=False)`

Get all models in the application

#### Parameters

- **public\_only** – only yield public models
- **private\_only** – only yield private models that tie to your own account

**Returns** a generator function that yields Model objects

## Examples

```
>>> for model in app.models.get_all():
>>>     print(model.model_name)
```

### `get_by_page(public_only=False, private_only=False, page=1, per_page=20)`

get paginated models from the application

When the number of models gets high, you may want to get the paginated results from all the models

#### Parameters

- **public\_only** – only yield public models
- **private\_only** – only yield private models that tie to your own account
- **page** – page number
- **per\_page** – number of models returned in one page

**Returns** a list of Model objects

### Examples

```
>>> models = app.models.get_by_page(2, 20)
```

#### **init\_model\_cache** ()

Initialize the model cache for the public models

This will go through all public models and cache them

**Returns** JSON object containing the name, type, and id of all cached models

#### **search** (model\_name, model\_type=None)

Search the model by name and optionally type. Default is to search concept models only. All the custom model trained are concept models.

##### Parameters

- **model\_name** – name of the model. name is not unique.
- **model\_type** – default to None, equivalent to wildcards search

**Returns** a list of Model objects or None

### Examples

```
>>> # search for general models
>>> app.models.search('general')
>>>
>>> # search for color model
>>> app.models.search('color', model_type='color')
>>>
>>> # search for detect model
>>> app.models.search('face', model_type='detect')
```

## 1.4.5 Model

**class** clarifai.rest.client.**Model** (api, item=None, model\_id=None)

#### **add\_concepts** (concept\_ids)

merge concepts into a model

This is just an alias of *merge\_concepts*, for easier understanding of adding new concepts to the model without overwriting them.

**Parameters** **concept\_ids** – a list of concept IDs

**Returns** the Model object

## Examples

```
>>> model = self.app.models.get('model_id')
>>> model.add_concepts(['cat', 'dog'])
```

### **delete\_concepts** (*concept\_ids*)

delete concepts from a model

**Parameters** **concept\_ids** – a list of concept IDs to be removed

**Returns** the Model object

## Examples

```
>>> model = self.app.models.get('model_id')
>>> model.delete_concepts(['cat', 'dog'])
```

### **delete\_version** (*version\_id*)

delete model version by version\_id

**Parameters** **version\_id** – version id of the model version

**Returns** the JSON response

## Examples

```
>>> model = self.app.models.get('model_id')
>>> model.delete_version('model_version_id')
```

### **evaluate** ()

run model evaluation

**Returns** the model version data with evaluation metrics in JSON format

### **get\_concept\_ids** ()

get concepts IDs associated with the model

**Returns** a list of concept IDs

## Examples

```
>>> ids = model.get_concept_ids()
```

### **get\_info** (*verbose=False*)

get model info, with or without the concepts associated with the model.

**Parameters** **verbose** – default is False. True will yield output\_info, with concepts of the model

**Returns** raw json of the response

## Examples

```
>>> # with basic model info
>>> model.get_info()
>>> # model info with concepts
>>> model.get_info(verbose=True)
```

**get\_inputs** (*version\_id=None, page=1, per\_page=20*)

Get all the inputs from the model or a specific model version. Without specifying a model version id, this will yield all inputs

**Parameters**

- **version\_id** – model version id
- **page** – page number
- **per\_page** – number of inputs to return for each page

**Returns** A list of Input objects

**get\_version** (*version\_id*)

get model version info for a particular version

**Parameters** **version\_id** – version id of the model version

**Returns** the JSON response

### Examples

```
>>> model = self.app.models.get('model_id')
>>> model.get_version('model_version_id')
```

**list\_versions** ()

list all model versions

**Returns** the JSON response

### Examples

```
>>> model = self.app.models.get('model_id')
>>> model.list_versions()
```

**merge\_concepts** (*concept\_ids, overwrite=False*)

merge concepts in a model

When *overwrite* is *False*, if the concept does not exist in the model it will be appended. Otherwise, the original one will be kept.

**Parameters**

- **concept\_ids** – a list of concept id
- **overwrite** – True or False. If True, the existing concepts will be replaced

**Returns** the Model object

**predict** (*inputs, model\_output\_info=None*)

predict with multiple images

**Parameters**

- **inputs** – a list of Image objects

- **model\_output\_info** – the model output info

**Returns** the prediction of the model in JSON format

**predict\_by\_base64** (*base64\_bytes*, *lang=None*, *is\_video=False*, *min\_value=None*,  
*max\_concepts=None*, *select\_concepts=None*, *sample\_ms=None*)  
predict a model with base64 encoded image bytes

**Parameters**

- **base64\_bytes** – base64 encoded image bytes
- **lang** – language to predict, if the translation is available
- **is\_video** – whether this is a video
- **min\_value** – threshold to cut the predictions, 0-1.0
- **max\_concepts** – max concepts to keep in the predictions, 0-200
- **select\_concepts** – a list of concepts that are selected to be exposed
- **sample\_ms** – video frame prediction every sample\_ms milliseconds

**Returns** the prediction of the model in JSON format

**predict\_by\_bytes** (*raw\_bytes*, *lang=None*, *is\_video=False*, *min\_value=None*,  
*max\_concepts=None*, *select\_concepts=None*, *sample\_ms=None*)  
predict a model with image raw bytes

**Parameters**

- **raw\_bytes** – raw bytes of an image
- **lang** – language to predict, if the translation is available
- **is\_video** – whether this is a video
- **min\_value** – threshold to cut the predictions, 0-1.0
- **max\_concepts** – max concepts to keep in the predictions, 0-200
- **select\_concepts** – a list of concepts that are selected to be exposed
- **sample\_ms** – video frame prediction every sample\_ms milliseconds

**Returns** the prediction of the model in JSON format

**predict\_by\_filename** (*filename*, *lang=None*, *is\_video=False*, *min\_value=None*,  
*max\_concepts=None*, *select\_concepts=None*, *sample\_ms=None*)  
predict a model with a local filename

**Parameters**

- **filename** – filename on local filesystem
- **lang** – language to predict, if the translation is available
- **is\_video** – whether this is a video
- **min\_value** – threshold to cut the predictions, 0-1.0
- **max\_concepts** – max concepts to keep in the predictions, 0-200
- **select\_concepts** – a list of concepts that are selected to be exposed
- **sample\_ms** – video frame prediction every sample\_ms milliseconds

**Returns** the prediction of the model in JSON format

**predict\_by\_url** (*url*, *lang=None*, *is\_video=False*, *min\_value=None*, *max\_concepts=None*, *select\_concepts=None*, *sample\_ms=None*)  
predict a model with url

#### Parameters

- **url** – publicly accessible url of an image
- **lang** – language to predict, if the translation is available
- **is\_video** – whether this is a video
- **min\_value** – threshold to cut the predictions, 0-1.0
- **max\_concepts** – max concepts to keep in the predictions, 0-200
- **select\_concepts** – a list of concepts that are selected to be exposed
- **sample\_ms** – video frame prediction every sample\_ms milliseconds

**Returns** the prediction of the model in JSON format

**train** (*sync=True*, *timeout=60*)

train the model in synchronous or asynchronous mode. Synchronous will block until the model is trained, async will not.

#### Parameters

- **sync** – indicating synchronous or asynchronous, default is True
- **timeout** – Used when sync=True. Num. of seconds we should wait for training to complete.

**Returns** the Model object

**update** (*action='merge'*, *model\_name=None*, *concepts\_mutually\_exclusive=None*, *closed\_environment=None*, *concept\_ids=None*)

Update the model attributes. The name of the model, list of concepts, and the attributes `concepts_mutually_exclusive` and `closed_environment` can be changed. Note this is a overwriting change. For a valid call, at least one or more attributes should be specified. Otherwise the call will be just skipped without error.

#### Parameters

- **action** – the way to patch the model: ['merge', 'remove', 'overwrite']
- **model\_name** – name of the model
- **concepts\_mutually\_exclusive** – whether the concepts are mutually exclusive
- **closed\_environment** – whether negative concepts should be taken into account during training
- **concept\_ids** – a list of concept ids

**Returns** the Model object

## Examples

```
>>> model = self.app.models.get('model_id')
>>> model.update(model_name="new_model_name")
>>> model.update(concepts_mutually_exclusive=False)
>>> model.update(closed_environment=True)
```

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```
>>> model.update(concept_ids=["bird", "hurd"])
>>> model.update(concepts_mutually_exclusive=True, concept_ids=["bird", "hurd"
↪])
```

## 1.4.6 Search Syntax

### **class** clarifai.rest.client.SearchTerm

Clarifai search term interface. This is the base class for InputSearchTerm and OutputSearchTerm

It is used to build SearchQueryBuilder

```
class clarifai.rest.client.InputSearchTerm(url=None, input_id=None, concept=None,
                                           concept_id=None, value=True, meta-
                                           data=None, geo=None)
```

Clarifai Input Search Term for an image search. For input search, you can specify search terms for url string match, input\_id string match, concept string match, concept\_id string match, and geographic information. Value indicates whether the concept search is a NOT search

### Examples

```
>>> # search for url, string match
>>> InputSearchTerm(url='http://blabla')
>>> # search for input ID, string match
>>> InputSearchTerm(input_id='site1_bla')
>>> # search for annotated concept
>>> InputSearchTerm(concept='tag1')
>>> # search for not the annotated concept
>>> InputSearchTerm(concept='tag1', value=False)
>>> # search for metadata
>>> InputSearchTerm(metadata={'key': 'value'})
>>> # search for geo
>>> InputSearchTerm(geo=Geo(geo_point=GeoPoint(-40, 30),
>>>                          geo_limit=GeoLimit('withinMiles', 10)))
```

```
class clarifai.rest.client.OutputSearchTerm(url=None, base64=None, input_id=None,
                                           concept=None, concept_id=None,
                                           value=True, crop=None)
```

Clarifai Output Search Term for image search. For output search, you can specify search term for url, base64, and input\_id for visual search, or specify concept and concept\_id for string match. Value indicates whether the concept search is a NOT search

### Examples

```
>>> # search for visual similarity from url
>>> OutputSearchTerm(url='http://blabla')
>>> # search for visual similarity from base64 encoded image
>>> OutputSearchTerm(base64='sdfds')
>>> # search for visual similarity from input id
>>> OutputSearchTerm(input_id='site1_bla')
>>> # search for predicted concept
>>> OutputSearchTerm(concept='tag1')
>>> # search for not the predicted concept
>>> OutputSearchTerm(concept='tag1', value=False)
```

**class** clarifai.rest.client.**SearchQueryBuilder** (*language=None*)  
Clarifai Image Search Query Builder

This builder is for advanced search use ONLY.

If you are looking for simple concept search, or simple image similarity search, you should use one of the existing functions `search_by_annotated_concepts`, `search_by_predicted_concepts`, `search_by_image` or `search_by_metadata`

Currently the query builder only supports a list of query terms with AND. `InputSearchTerm` and `OutputSearchTerm` are the only terms supported by the query builder

### Examples

```
>>> qb = SearchQueryBuilder()
>>> qb.add_term(term1)
>>> qb.add_term(term2)
>>>
>>> app.inputs.search(qb)
>>>
>>> # for search over translated output concepts
>>> qb = SearchQueryBuilder(language='zh')
>>> qb.add_term(term1)
>>> qb.add_term(term2)
>>>
>>> app.inputs.search(qb)
```

**add\_term** (*term*)

add a search term to the query. This can search by input or by output. Construct the term argument with an `InputSearchTerm` or `OutputSearchTerm` object.

**dict** ()

construct the raw query for the RESTful API

## 1.4.7 Exceptions

**class** clarifai.rest.client.**ApiError** (*resource, params, method, response=None*)  
API Server error

**class** clarifai.rest.client.**ApiClientError**  
API Client Error

**class** clarifai.rest.client.**UserError**  
User Error



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