quickdraw Documentation

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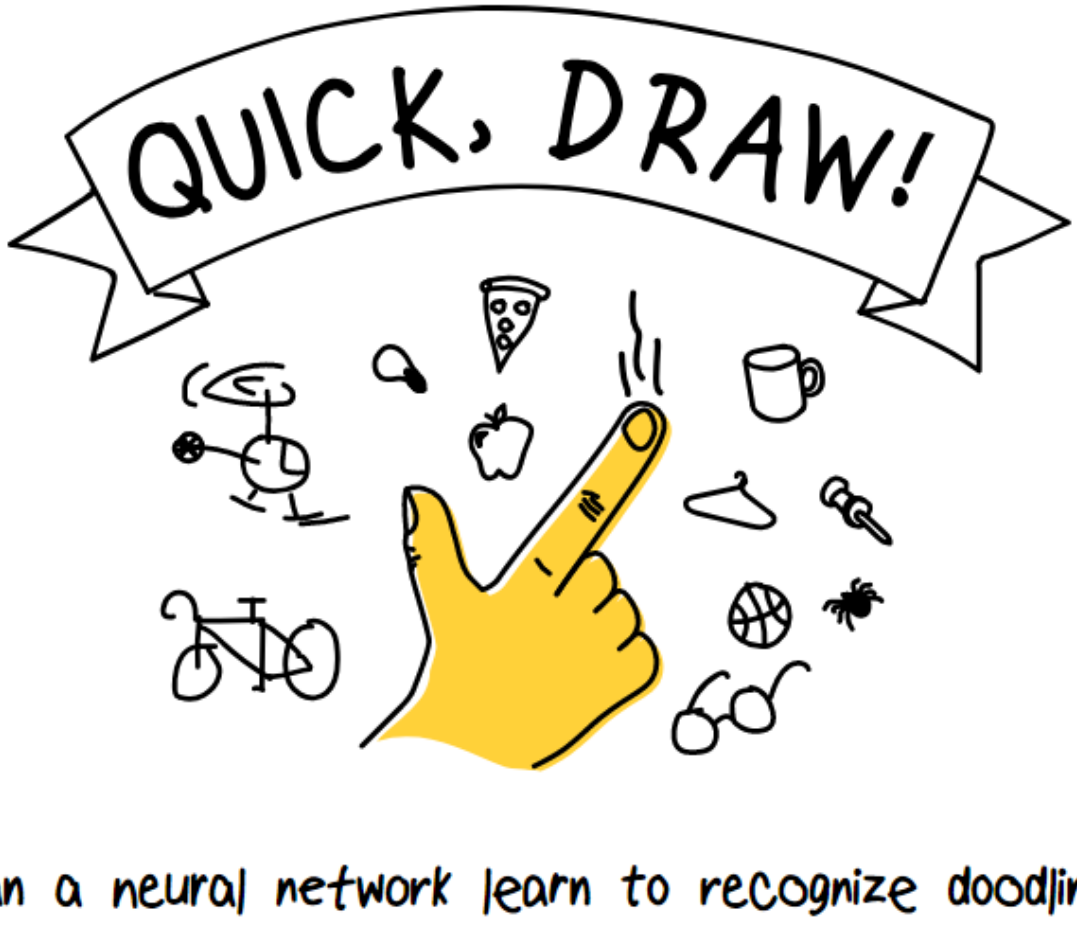
Contents:

Quick Draw is a drawing game which is training a neural network to recognise doodles.



`quickdraw` is a Python API for accessing the Quick Draw data - it downloads the data files as and when needed, caches them locally and interprets them so they can be used.

Created by Martin O'Hanlon (@martinohanlon, stuffaboutco.de).

CHAPTER 1

Getting started

Install the *quickdraw* python library using *pip*.

- Windows

```
pip install quickdraw
```

- macOS

```
pip3 install quickdraw
```

- Linux / Raspberry Pi

```
sudo pip3 install quickdraw
```

CHAPTER 2

Use

Here are some examples of how to use `quickdraw` but be sure to also checkout the API documentation for more information.

Open the Quick Draw data using QuickDrawData and pull back a drawing of an **anvil**.

```
from quickdraw import QuickDrawData
qd = QuickDrawData()
anvil = qd.get_drawing("anvil")

print(anvil)
```

`quickdraw` will download the `anvil.bin` data file and return the data for a random drawing of an anvil (well a doodle of an anvil anyway).

Drawings are returned as QuickDrawing objects which exposes the properties of the drawing.

```
print(anvil.name)
print(anvil.key_id)
print(anvil.countrycode)
print(anvil.recognized)
print(anvil.timestamp)
print(anvil.no_of_strokes)
print(anvil.image_data)
print(anvil.strokes)
```

You can save the drawing using the `image` property.

```
anvil.image.save("my_anvil.gif")
```

You can save an animation of the drawing using the `animation` property.

```
anvil.animation.save("my_anvil_animation.gif")
```

You can open a group of Quick Draw drawings using QuickDrawDataGroup passing the name of the drawing ("anvil", "aircraft", "baseball", etc).

```
from quickdraw import QuickDrawDataGroup

anvils = QuickDrawDataGroup("anvil")
print(anvils.drawing_count)
print(anvils.get_drawing())
```

By default only 1000 drawings are opened, you can change this by modifying the `max_drawings` parameter of QuickDrawDataGroup, setting it to `None` will open all the drawings in that group.

```
from quickdraw import QuickDrawDataGroup

anvils = QuickDrawDataGroup("anvil", max_drawings=None)
print(anvils.drawing_count)
```

To iterate through all the drawings in a group use the drawings generator.

```
from quickdraw import QuickDrawDataGroup

qdg = QuickDrawDataGroup("anvil")
for drawing in qdg.drawings:
    print(drawing)
```

You can get a list of all the drawing names using the drawing_names property of QuickDrawData.

```
from quickdraw import QuickDrawData

qd = QuickDrawData()
print(qd.drawing_names)
```

CHAPTER 3

Examples

Code examples can be found in the quickdraw GitHub repository.

CHAPTER 4

Documentation

API documentation can be found at quickdraw.readthedocs.io

CHAPTER 5

Warning

The drawings have been moderated but there is no guarantee it'll actually be a picture of what you are asking it for (although in my experience they are)!

CHAPTER 6

Status

Stable.

Raise any issues in the github repository.

CHAPTER 7

Table of Contents

7.1 quickdraw API

7.1.1 QuickDrawData

class quickdraw.**QuickDrawData**(*recognized=None*, *max_drawings=1000*, *refresh_data=False*, *jit_loading=True*, *print_messages=True*, *cache_dir='./.quickdrawcache'*)

Allows interaction with the Google Quick, Draw! data set, downloads Quick Draw data from https://storage.googleapis.com/quickdraw_dataset/full/binary/ and loads it into memory for easy access and processing.

The following example will load the anvil drawings and get a single drawing:

```
from quickdraw import QuickDrawData

qd = QuickDrawData()

anvil = qd.get_drawing("anvil")
anvil.image.save("my_anvil.gif")
```

Parameters

- **recognized** (*bool*) – If `True` only recognized drawings will be loaded, if `False` only unrecognized drawings will be loaded, if `None` (the default) both recognized and unrecognized drawings will be loaded.
- **max_drawings** (*int*) – The maximum number of drawings to be loaded into memory, defaults to 1000.
- **refresh_data** (*bool*) – If `True` forces data to be downloaded even if it has been downloaded before, defaults to `False`.
- **jit_loading** (*bool*) – If `True` (the default) only downloads and loads data into memory when it is required (jit = just in time). If `False` all drawings will be downloaded and loaded into memory.

- **print_messages** (*bool*) – If `True` (the default), status messages will be printed stating when data is being downloaded or loaded.
- **cache_dir** (*string*) – Specify a cache directory to use when downloading data files, defaults to *./.quickdrawcache*.

get_drawing(*name*, *index=None*)
Get a drawing.

Returns an instance of *QuickDrawing* representing a single Quick, Draw drawing.

Parameters

- **name** (*string*) – The name of the drawing to get (anvil, ant, aircraft, etc).
- **index** (*int*) – The index of the drawing to get.

  If `None` (the default) a random drawing will be returned.

get_drawing_group(*name*)
Get a group of drawings by name.

Returns an instance of *QuickDrawDataGroup*.

Parameters **name** (*string*) – The name of the drawings (anvil, ant, aircraft, etc).

load_all_drawings()
Loads (and downloads if required) all drawings into memory.

load_drawings(*list_of_drawings*)
Loads (and downloads if required) all drawings into memory.

Parameters **list_of_drawings** (*list*) – A list of the drawings to be loaded (anvil, ant, aircraft, etc).

search_drawings(*name*, *key_id=None*, *recognized=None*, *countrycode=None*, *timestamp=None*)
Search the drawings.

Returns an list of *QuickDrawing* instances representing the matched drawings.

Note - search criteria are a compound.

Search for all the drawings with the `countrycode` "PL"

```
from quickdraw import QuickDrawDataGroup

anvils = QuickDrawDataGroup("anvil")
results = anvils.search_drawings(countrycode="PL")
```

Parameters

- **name** (*string*) – The name of the drawings (anvil, ant, aircraft, etc) to search.
- **key_id** (*int*) – The `key_id` to such for. If `None` (the default) the `key_id` is not used.
- **recognized** (*bool*) – To search for drawings which were `recognized`. If `None` (the default) `recognized` is not used.
- **countrycode** (*int*) – To search for drawings which with the `countrycode`. If `None` (the default) `countrycode` is not used.
- **countrycode** – To search for drawings which with the `timestamp`. If `None` (the default) `timestamp` is not used.

drawing_names
Returns a list of all the potential drawing names.

loaded_drawings
Returns a list of drawing which have been loaded into memory.

7.1.2 QuickDrawDataGroup

class quickdraw.**QuickDrawDataGroup**(*name*, *recognized=None*, *max_drawings=1000*, *refresh_data=False*, *print_messages=True*, *cache_dir='./.quickdrawcache'*)
Allows interaction with a group of Quick, Draw! drawings.

The following example will load the ant group of drawings and get a single drawing:

```
from quickdraw import QuickDrawDataGroup

ants = QuickDrawDataGroup("ant")
ant = ants.get_drawing()
ant.image.save("my_ant.gif")
```

Parameters

- **name** (*string*) – The name of the drawings to be loaded (anvil, ant, aircraft, etc).
- **recognized** (*bool*) – If `True` only recognized drawings will be loaded, if `False` only unrecognized drawings will be loaded, if `None` (the default) both recognized and unrecognized drawings will be loaded.
- **max_drawings** (*int*) – The maximum number of drawings to be loaded into memory, defaults to 1000.
- **refresh_data** (*bool*) – If `True` forces data to be downloaded even if it has been downloaded before, defaults to *False*.
- **print_messages** (*bool*) – If `True` (the default), status messages will be printed stating when data is being downloaded or loaded.
- **cache_dir** (*string*) – Specify a cache directory to use when downloading data files, defaults to `./.quickdrawcache`.

get_drawing(*index=None*)
Get a drawing from this group.

Returns an instance of *QuickDrawing* representing a single Quick, Draw drawing.

Get a single anvil drawing:

```
from quickdraw import QuickDrawDataGroup

anvils = QuickDrawDataGroup("anvil")
anvil = anvils.get_drawing()
```

Parameters **index** (*int*) – The index of the drawing to get.

If `None` (the default) a random drawing will be returned.

search_drawings(*key_id=None*, *recognized=None*, *countrycode=None*, *timestamp=None*)
Searches the drawings in this group.

Returns an list of *QuickDrawing* instances representing the matched drawings.

Note - search criteria are a compound.

Search for all the drawings with the `countrycode` "PL"

```
from quickdraw import QuickDrawDataGroup

anvils = QuickDrawDataGroup("anvil")
results = anvils.search_drawings(countrycode="PL")
```

Parameters

- **key_id** (*int*) – The `key_id` to such for. If `None` (the default) the `key_id` is not used.
- **recognized** (*bool*) – To search for drawings which were `recognized`. If `None` (the default) `recognized` is not used.
- **countrycode** (*int*) – To search for drawings which with the `countrycode`. If `None` (the default) `countrycode` is not used.
- **countrycode** – To search for drawings which with the `timestamp`. If `None` (the default) `timestamp` is not used.

drawing_count
Returns the number of drawings loaded.

drawings
An iterator of all the drawings loaded in this group. Returns a *QuickDrawing* object.

Load the anvil group of drawings and iterate through them:

```
from quickdraw import QuickDrawDataGroup

anvils = QuickDrawDataGroup("anvil")
for anvil in anvils.drawings:
    print(anvil)
```

7.1.3 QuickDrawing

class quickdraw.**QuickDrawing**(*name*, *drawing_data*)
Represents a single Quick, Draw! drawing.

get_animation(*stroke_color=(0, 0, 0)*, *stroke_width=2*, *bg_color=(255, 255, 255)*)
Returns a *QuickDrawAnimation* instance representing the an animation of the QuickDrawing being created.

Parameters

- **stroke_color** (*int*) – A list of RGB (red, green, blue) values for the stroke color, defaults to (0,0,0).
- **stroke_color** – A width of the stroke, defaults to 2.
- **bg_color** (*list*) – A list of RGB (red, green, blue) values for the background color, defaults to (255,255,255).

get_image(*stroke_color=(0, 0, 0)*, *stroke_width=2*, *bg_color=(255, 255, 255)*)
Get a PIL Image object of the drawing.

Parameters

- **stroke_color** (*int*) – A list of RGB (red, green, blue) values for the stroke color, defaults to (0,0,0).
- **stroke_color** – A width of the stroke, defaults to 2.
- **bg_color** (*list*) – A list of RGB (red, green, blue) values for the background color, defaults to (255,255,255).

animation
Returns a *QuickDrawAnimation* instance representing the an animation of the QuickDrawing on a white background with a black drawing. Alternative image parameters can be set using `get_animation()`.

To save the animation you would use the `save` method:

```
from quickdraw import QuickDrawData

qd = QuickDrawData()

anvil = qd.get_drawing("anvil")
anvil.animation.save("my_anvil_animation.gif")
```

countrycode
Returns the country code for the drawing.

image
Returns a PIL Image object of the drawing on a white background with a black drawing. Alternative image parameters can be set using `get_image()`.

To save the image you would use the `save` method:

```
from quickdraw import QuickDrawData

qd = QuickDrawData()

anvil = qd.get_drawing("anvil")
anvil.image.save("my_anvil.gif")
```

image_data
Returns the raw image data as list of strokes with a list of X co-ordinates and a list of Y co-ordinates.

Co-ordinates are aligned to the top-left hand corner with values from 0 to 255.

See https://github.com/googlecreativelab/quickdraw-dataset#simplified-drawing-files-ndjson for more information regarding how the data is represented.

key_id
Returns the id of the drawing.

name
Returns the name of the drawing (anvil, aircraft, ant, etc).

no_of_strokes
Returns the number of pen strokes used to create the drawing.

recognized
Returns a boolean representing whether the drawing was recognized.

strokes
Returns a list of pen strokes containing a list of (x,y) coordinates which make up the drawing.

To iterate though the strokes data use:

```
from quickdraw import QuickDrawData

qd = QuickDrawData()

anvil = qd.get_drawing("anvil")
for stroke in anvil.strokes:
    for x, y in stroke:
        print("x={} y={}".format(x, y))
```

timestamp
Returns the time the drawing was created (in seconds since the epoch).

7.1.4 QuickDrawAnimation

class quickdraw.**QuickDrawAnimation**(*quick_drawing*, *stroke_color*, *stroke_width*, *bg_color*)
Represents an animation of a *QuickDrawing*.

While an instance can be created directly it is typically returned by *QuickDrawing.get_animation()* or *QuickDrawing.animation()*.

To save the animation you would use the `save` method:

```
from quickdraw import QuickDrawData

qd = QuickDrawData()

anvil = qd.get_drawing("anvil")
anvil.animation.save("my_anvil_animation.gif")
```

save(*filename*, *frame_length=0.1*, *loop_times=0*)
Save's the animation to a given filename.

Parameters

- **filename** (*string*) – The filename or path to save the animation. The filetype must be `gif`.
- **frame_length** (*int*) – The time in seconds between each frame, defaults to 0.1.
- **loop_times** (*int*) – The number of times the animation should loop. A value of 0 will result in the animation looping forever. A value of `None` will result in the animation not looping. The default is 0.

frames
Returns a list PIL Image objects of the animation.

7.2 Change log

7.2.1 1.0.0 - 2022-05-16

- Added QuickDrawAnimation

- Made the project version 1.0.0 and set as Stable

7.2.2 0.2.0 - 2021-03-10

- Python 3.7+ compatibility fix

7.2.3 0.1.0

- Beta
- Bug fixes
- Additional properties methods and stuff
- Tests

7.2.4 0.0.1 > 0.0.4

- Alpha - setting up, working out the api, sorting out the bugs

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q

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