
wbia-pyflann

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1.1 Submodules

1.2 `pyflann.__main__` module

`pyflann.__main__.main()`

1.3 `pyflann.exceptions` module

exception `pyflann.exceptions.FLANNException`
Bases: `Exception`

1.4 `pyflann.flann_ctypes` module

class `pyflann.flann_ctypes.CustomStructure`
Bases: `_ctypes.Structure`

This class extends the functionality of the ctype's structure class by adding custom default values to the fields and a way of translating field types.

keys ()

update (*dict*)

class `pyflann.flann_ctypes.FLANNParameters`
Bases: `pyflann.flann_ctypes.CustomStructure`

algorithm
Structure/Union member

branching
Structure/Union member

build_weight
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sorted
Structure/Union member

table_number_
Structure/Union member

target_precision
Structure/Union member

trees
Structure/Union member

class pyflann.flann_ctypes.FlannLib
Bases: `object`

pyflann.flann_ctypes.define_functions (*fmtstr*)

```
pyflann.flann_ctypes.ensure_2d_array(arr, flags, **kwargs)
```

```
pyflann.flann_ctypes.load_flann_library()
```

CommandLine: python -c "import pyflann" -verbose

1.5 pyflann.index module

```
class pyflann.index.FLANN(**kwargs)
```

Bases: `object`

This class defines a python interface to the FLANN library.

Example

```
>>> from pyflann import FLANN
>>> import numpy as np
>>> dvecs = np.random.rand(1000, 128)
>>> qvecs = np.random.rand(10, 128)
>>> flann = FLANN()
>>> params = flann.build_index(dvecs)
```

```
add_points(pts, rebuild_threshold=2)
```

Adds points to pre-built index.

Parameters

- **pts** – 2D numpy array of points.
- **rebuild_threshold** – reallocs index when it grows by factor of *rebuild_threshold*. A smaller value results in more space efficient but less computationally efficient. Must be greater than 1.

```
build_index(pts, **kwargs)
```

This builds and internally stores an index to be used for future nearest neighbor matchings. It erases any previously stored indexes, so use multiple instances of this class to work with multiple stored indices. Use `nn_index(...)` to find the nearest neighbors in this index.

`pts` is a 2d numpy array or matrix. All the computation is done in `np.float32` type, but `pts` may be any type that is convertible to `np.float32`.

```
delete_index(**kwargs)
```

Deletes the current index freeing all the memory it uses. The memory used by the dataset that was indexed is not freed unless there are no other references to those numpy arrays.

```
get_indexed_data()
```

returns all the data indexed by the FLANN object

(this returns points that have been removed but still exist in memory)

```
get_indexed_shape()
```

returns the shape of the data being indexed

```
hierarchical_kmeans(pts, branch_size, num_branches, max_iterations=None, dtype=None, **kwargs)
```

Clusters the data by using multiple runs of kmeans to recursively partition the dataset. The number of resulting clusters is given by $(branch_size-1)*num_branches+1$.

This method can be significantly faster when the number of desired clusters is quite large (e.g. a hundred or more). Higher branch sizes are slower but may give better results.

If dtype is None (the default), the array returned is the same type as pts. Otherwise, the returned array is of type dtype.

kmeans (*pts, num_clusters, max_iterations=None, dtype=None, **kwargs*)

Runs kmeans on pts with num_clusters centroids. Returns a numpy array of size num_clusters x dim.

If max_iterations is not None, the algorithm terminates after the given number of iterations regardless of convergence. The default is to run until convergence.

If dtype is None (the default), the array returned is the same type as pts. Otherwise, the returned array is of type dtype.

load_index (*filename, pts*)

Loads an index previously saved to disk.

nn (*pts, qpts, num_neighbors=1, **kwargs*)

Returns the num_neighbors nearest points in dataset for each point in testset.

nn_index (*qpts, num_neighbors=1, **kwargs*)

For each point in querypts, (which may be a single point), it returns the num_neighbors nearest points in the index built by calling build_index.

nn_radius (*query, radius, **kwargs*)

remove_point (*idx*)

Removes a point from a pre-built index.

remove_points (*id_list*)

Removes multiple points from the index

Params: id_list = point ids to be removed

Returns: void

save_index (*filename*)

This saves the index to a disk file.

shape

used_memory ()

Returns the amount of memory used by the index

Returns: int

used_memory_dataset ()

Returns the amount of memory used by the dataset

`pyflann.index.set_distance_type` (*distance_type, order=0*)

Sets the distance type used. Possible values: euclidean, manhattan, minkowski, max_dist, hik, hellinger, cs, kl.

`pyflann.index.to_bytes` (*string*)

1.6 Module contents

mkinit pyflann

class `pyflann.CustomStructure`

Bases: `_ctypes.Structure`

This class extends the functionality of the ctype's structure class by adding custom default values to the fields and a way of translating field types.

keys ()

update (*dict*)

class pyflann.**FLANN** (***kwargs*)

Bases: `object`

This class defines a python interface to the FLANN library.

Example

```
>>> from pyflann import FLANN
>>> import numpy as np
>>> dvecs = np.random.rand(1000, 128)
>>> qvecs = np.random.rand(10, 128)
>>> flann = FLANN()
>>> params = flann.build_index(dvecs)
```

add_points (*pts*, *rebuild_threshold=2*)

Adds points to pre-built index.

Parameters

- **pts** – 2D numpy array of points.
- **rebuild_threshold** – reallocs index when it grows by factor of *rebuild_threshold*. A smaller value results in more space efficiency but is less computationally efficient. Must be greater than 1.

build_index (*pts*, ***kwargs*)

This builds and internally stores an index to be used for future nearest neighbor matchings. It erases any previously stored indexes, so use multiple instances of this class to work with multiple stored indices. Use `nn_index(...)` to find the nearest neighbors in this index.

pts is a 2d numpy array or matrix. All the computation is done in `np.float32` type, but *pts* may be any type that is convertible to `np.float32`.

delete_index (***kwargs*)

Deletes the current index freeing all the memory it uses. The memory used by the dataset that was indexed is not freed unless there are no other references to those numpy arrays.

get_indexed_data ()

returns all the data indexed by the FLANN object

(this returns points that have been removed but still exist in memory)

get_indexed_shape ()

returns the shape of the data being indexed

hierarchical_kmeans (*pts*, *branch_size*, *num_branches*, *max_iterations=None*, *dtype=None*, ***kwargs*)

Clusters the data by using multiple runs of kmeans to recursively partition the dataset. The number of resulting clusters is given by $(branch_size-1)*num_branches+1$.

This method can be significantly faster when the number of desired clusters is quite large (e.g. a hundred or more). Higher branch sizes are slower but may give better results.

If *dtype* is `None` (the default), the array returned is the same type as *pts*. Otherwise, the returned array is of type *dtype*.

kmeans (*pts, num_clusters, max_iterations=None, dtype=None, **kwargs*)

Runs kmeans on pts with num_clusters centroids. Returns a numpy array of size num_clusters x dim.

If max_iterations is not None, the algorithm terminates after the given number of iterations regardless of convergence. The default is to run until convergence.

If dtype is None (the default), the array returned is the same type as pts. Otherwise, the returned array is of type dtype.

load_index (*filename, pts*)

Loads an index previously saved to disk.

nn (*pts, qpts, num_neighbors=1, **kwargs*)

Returns the num_neighbors nearest points in dataset for each point in testset.

nn_index (*qpts, num_neighbors=1, **kwargs*)

For each point in querypts, (which may be a single point), it returns the num_neighbors nearest points in the index built by calling build_index.

nn_radius (*query, radius, **kwargs*)

remove_point (*idx*)

Removes a point from a pre-built index.

remove_points (*id_list*)

Removes multiple points from the index

Params: id_list = point ids to be removed

Returns: void

save_index (*filename*)

This saves the index to a disk file.

shape

used_memory ()

Returns the amount of memory used by the index

Returns: int

used_memory_dataset ()

Returns the amount of memory used by the dataset

exception pyflann.FLANNException

Bases: Exception

class pyflann.FLANNParameters

Bases: *pyflann.flann_ctypes.CustomStructure*

algorithm

Structure/Union member

branching

Structure/Union member

build_weight

Structure/Union member

cb_index

Structure/Union member

centers_init

Structure/Union member

```

checks
    Structure/Union member

cores
    Structure/Union member

eps
    Structure/Union member

iterations
    Structure/Union member

key_size_
    Structure/Union member

leaf_max_size
    Structure/Union member

log_level
    Structure/Union member

max_neighbors
    Structure/Union member

memory_weight
    Structure/Union member

multi_probe_level_
    Structure/Union member

random_seed
    Structure/Union member

sample_fraction
    Structure/Union member

sorted
    Structure/Union member

table_number_
    Structure/Union member

target_precision
    Structure/Union member

trees
    Structure/Union member

pyflann.FLANN_INDEX
    alias of ctypes.c_void_p

class pyflann.FlannLib
    Bases: object

pyflann.STRING
    alias of ctypes.c_char_p

pyflann.define_functions (fmtstr)

pyflann.ensure_2d_array (arr, flags, **kwargs)

pyflann.index_type
    alias of numpy.int32

pyflann.load_flann_library()

```

CommandLine: python -c “import pyflann” –verbose

`pyflann.set_distance_type(distance_type, order=0)`

Sets the distance type used. Possible values: euclidean, manhattan, minkowski, max_dist, hik, hellinger, cs, kl.

`pyflann.to_bytes(string)`

CHAPTER 2

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