
imagecolor Documentation

Release 1.2.1

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Jan 12, 2018

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imagecolor - Extract colors from images

imagecolor is a python module for averaging images using `pillow`. To speed up processing of multiple images it uses `concurrent.futures` to bypass the GIL by spawning worker processes.

1.1 Important notes

1.1.1 Warnings

Warning: imagecolor only supports python3.6 currently.

1.1.2 Notes

Note: imagecolor is only tested on macOS and Linux currently.

Note: imagecolor only works on 3 channel RGB images.

1.2 Installation

1.2.1 Basic Installation

Install imagecolor with `pip`:

```
$ pip install imagecolor
```

Depending on your platform you might need to install the required [dependencies](#) for pillow before pillow (and imagecolor) will install fully.

1.3 Usage examples

To use imagecolor import it with

```
import imagecolor
```

1.3.1 average an image

Average a single image file to a dict with red, green, & blue keys along with the file name as name

```
imagecolor.file_average(image)
```

1.3.2 average all images in a directory

Averages all images in a directory to a list of dicts with red, green, & blue keys along with the file name as name

```
imagecolor.directory_average(image)
```

1.3.3 average a directory

Averages all images in a directory to a dict with red, green, & blue keys along with the directory name as name

```
imagecolor.single_directory_average(image)
```

1.3.4 average nested directories

Uses `single_directory_average` to average the directory and all subdirectories containing images to a list of dicts with red, green, & blue keys along with each directory name as name

```
imagecolor.nested_directory_average(image)
```

For more details read the full module [reference](#)

1.4 Development

1.4.1 Development Installation

image color uses [pipenv](#) to manage development dependencies.

Install development dependencies with **pipenv**:

```
$ pipenv install --dev
```

1.4.2 make commands

- `all`: calls `release` and `html`
- `release` checks the code with `test` and then calls `source-dist` and `wheel-dist`
- `source-dist` builds a source distribution
- `wheel-dist` builds a wheel distribution
- `lint` lints imagecolor with `pylint`, `pycodestyle`, `pydocstyle`
- `test` lints the code and then runs `pytest`
- `html` builds html docs with `Sphinx`
- `clean` cleans the build and dist directories

2.1 The MIT License

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3.1 imagecolor package

3.1.1 Module contents

imagecolor initialization.

`imagecolor.core_average` (*image*, *downsample=True*, *max_size=100*, *alpha_threshold=245*)
Average a single image.

Averages a single image from a file or file-like object. By default downsamples images that are larger than 100px on the long side for speed. Ignores pixels that are more transparent than the `alpha_threshold`.

Parameters

- **image** (*str*) – A filename, `pathlib.Path` object or a file object.
- **downsample** (*bool*, *optional*) – if downsampling is enabled to speed up iteration.
- **max_size** (*int*, *optional*) – max length of longest side if `downsample == True`.
- **alpha_threshold** (*int*, *optional*) – level at which transparent pixels are excluded.

Returns A dictionary with the following keys: red, green, blue.

Return type dict

Raises

- `IOError` – If the file cannot be found, or the image cannot be opened and identified.
- `ImageAveragingError` – If the image could not be averaged.

`imagecolor.file_average` (*image*, *name=None*, *downsample=True*, *max_size=100*, *alpha_threshold=245*)
Average a single image and keep track of its file name.

Averages a single image from a file or file-like object. `name` is extracted from the filepath unless `set`. By default downsamples images that are larger than 100px on the long side for speed. Ignores pixels that are more transparent than the `alpha_threshold`.

Parameters

- **image** (*str*) – A filename, `pathlib.Path` object or a file object.
- **name** (*str*, *optional*) – auto generated from path unless `set`.
- **downsample** (*bool*, *optional*) – if downsampling is enabled to speed up iteration.
- **max_size** (*int*, *optional*) – max length of longest side if `downsample == True`.
- **alpha_threshold** (*int*, *optional*) – level at which transparent pixels are excluded.

Returns A dictionary with the following keys: `name`, `red`, `green`, `blue`.

Return type `dict`

Raises

- `AttributeError` – If `name` is not passed in and cannot be set from filepath.
- `IOError` – If the file cannot be found, or the image cannot be opened and identified.
- `ImageAveragingError` – If the image could not be averaged.

`imagecolor.directory_average` (*path*, *image_formats*=(`'jpeg'`, `'png'`))

Average all images in a directory.

Accepts the path to a directory and averages each individual image. Uses `concurrent.futures` to process images in parallel. If images fail to average successfully, the exceptions are caught and logged allowing other images to finish. By default only averages `jpeg` and `png` images.

Parameters

- **path** (*str*) – Path to directory.
- **image_formats** (*tuple of str*, *optional*) – tuple of image formats used by `imghdr` to determine what types of images to average. Defaults: (`'jpeg'`, `'png'`)

Returns For each image averaged, returns a list of dictionaries each with the following keys: `name`, `red`, `green`, `blue`.

Return type `list`

Raises `ImageAveragingError` – If no images were averaged successfully.

`imagecolor.single_directory_average` (*path*, *image_formats*=(`'jpeg'`, `'png'`))

Average all images in a directory into a single average.

Accepts the path to a directory and averages each all images together into a single directory average. Uses `concurrent.futures` to process images in parallel. If images fail to average successfully, the exceptions are caught and logged allowing other images to finish. By default only averages `jpeg` and `png` images.

Parameters

- **path** (*str*) – Path to directory.
- **image_formats** (*tuple of str*, *optional*) – tuple of image formats used by `imghdr` to determine what types of images to average. Defaults: (`'jpeg'`, `'png'`)

Returns A dictionary with the following keys: `name`, `red`, `green`, `blue`.

Return type `dict`

Raises `DirectoryAveragingError` – If the directory could not be averaged.

`imagecolor.nested_directory_average` (*path*, *image_formats*=(*'jpeg'*, *'png'*))

Averages all subdirectories into a directory average for each directory.

Accepts the path to a directory and walks all the enclosed directories calling `single_directory_average` for each one that contains images. Uses `concurrent.futures` to process images in parallel. If images fail to average successfully, the exceptions are caught and logged allowing other images to finish. By default only averages jpeg and png images.

Parameters

- **path** (*str*) – path to directory
- **image_formats** (*tuple of str, optional*) – tuple of image formats used by `imghdr` to determine what types of images to average. Defaults: (*'jpeg'*, *'png'*)

Returns For each directory averaged, returns a list of dictionaries each with the following keys: `name`, `red`, `green`, `blue`.

Return type `list`

`imagecolor.results_line` (*results*)

Create a line of pixels from a list of results.

Accepts a list of results and creates an image that is 1 pixel tall and the length of the number of results. The image contains a pixel of the color of each result in the list of results.

Parameters **results** (*list*) – a list of imagecolor results

Returns linear image containing the results

Return type `PIL.Image.object`

`imagecolor.results_rectangle` (*results*, *aspectratio*=(*3*, *2*))

Create a rectangle of pixels from a list of results.

Accepts a list of results and creates an image that is rectangular. The aspect ratio can be set by passing a list formatted as [*16*,*9*] to `aspectratio`. The default is 3x2. The image contains a pixel of the color of each result in the list of results.

Parameters

- **results** (*list*) – a list of imagecolor results.
- **aspectratio** (*tuple of int*) – the aspect ratio of the image being created. Format (*3*, *2*)

Returns rectangular image containing the results.

Return type `PIL.Image.object`

`imagecolor.results_save_csv` (*results*, *path*)

Create a csv file from a list of results.

Accepts the path to a new csv file and a list containing results. Writes the current results to a csv file which can be re-loaded again by using `csv_to_results`. The csv created is formatted as follows: `'File or Folder'`, `'Red'`, `'Green'`, `'Blue'`

Parameters

- **results** (*list*) – a list of imagecolor results.
- **path** (*str*) – the path to the file to be created.

`imagecolor.results_load_csv` (*path*)

Create a list of results from a csv file.

Accepts the path to a csv file formatted as follows: 'File or Folder', 'Red', 'Green', 'Blue' parses the file line by line skipping the header. Returns a list containing an list for each line in the csv. Does not do any input checks other than converting the r, g, b columns to ints.

Parameters `path` (*str*) – the path to the file to be loaded.

Returns a list of imagecolor results.

Return type list

3.1.2 Submodules

3.1.3 imagecolor.average module

imagecolor functions for averaging images.

`imagecolor.average.core_average` (*image*, *downsample=True*, *max_size=100*, *alpha_threshold=245*)

Average a single image.

Averages a single image from a file or file-like object. By default downsamples images that are larger than 100px on the long side for speed. Ignores pixels that are more transparent than the `alpha_threshold`.

Parameters

- **image** (*str*) – A filename, `pathlib.Path` object or a file object.
- **downsample** (*bool*, *optional*) – if downsampling is enabled to speed up iteration.
- **max_size** (*int*, *optional*) – max length of longest side if `downsample == True`.
- **alpha_threshold** (*int*, *optional*) – level at which transparent pixels are excluded.

Returns A dictionary with the following keys: red, green, blue.

Return type dict

Raises

- `IOError` – If the file cannot be found, or the image cannot be opened and identified.
- `ImageAveragingError` – If the image could not be averaged.

`imagecolor.average.directory_average` (*path*, *image_formats=('jpeg', 'png')*)

Average all images in a directory.

Accepts the path to a directory and averages each individual image. Uses `concurrent.futures` to process images in parallel. If images fail to average successfully, the exceptions are caught and logged allowing other images to finish. By default only averages jpeg and png images.

Parameters

- **path** (*str*) – Path to directory.
- **image_formats** (*tuple of str*, *optional*) – tuple of image formats used by `imghdr` to determine what types of images to average. Defaults: ('jpeg', 'png')

Returns For each image averaged, returns a list of dictionaries each with the following keys: name, red, green, blue.

Return type list

Raises ImageAveragingError – If no images were averaged successfully.

`imagecolor.average.file_average` (*image*, *name=None*, *downsample=True*, *max_size=100*, *alpha_threshold=245*)

Average a single image and keep track of its file name.

Averages a single image from a file or file-like object. *name* is extracted from the filepath unless set. By default downsamples images that are larger than 100px on the long side for speed. Ignores pixels that are more transparent than the *alpha_threshold*.

Parameters

- **image** (*str*) – A filename, `pathlib.Path` object or a file object.
- **name** (*str*, *optional*) – auto generated from path unless set.
- **downsample** (*bool*, *optional*) – if downsampling is enabled to speed up iteration.
- **max_size** (*int*, *optional*) – max length of longest side if `downsample == True`.
- **alpha_threshold** (*int*, *optional*) – level at which transparent pixels are excluded.

Returns A dictionary with the following keys: name, red, green, blue.

Return type dict

Raises

- `AttributeError` – If *name* is not passed in and cannot be set from filepath.
- `IOError` – If the file cannot be found, or the image cannot be opened and identified.
- `ImageAveragingError` – If the image could not be averaged.

`imagecolor.average.nested_directory_average` (*path*, *image_formats=('jpeg', 'png')*)

Averages all subdirectories into a directory average for each directory.

Accepts the path to a directory and walks all the enclosed directories calling `single_directory_average` for each one that contains images. Uses `concurrent.futures` to process images in parallel. If images fail to average successfully, the exceptions are caught and logged allowing other images to finish. By default only averages jpeg and png images.

Parameters

- **path** (*str*) – path to directory
- **image_formats** (*tuple of str*, *optional*) – tuple of image formats used by `imghdr` to determine what types of images to average. Defaults: ('jpeg', 'png')

Returns For each directory averaged, returns a list of dictionaries each with the following keys: name, red, green, blue.

Return type list

`imagecolor.average.single_directory_average` (*path*, *image_formats=('jpeg', 'png')*)

Average all images in a directory into a single average.

Accepts the path to a directory and averages each all images together into a single directory average. Uses `concurrent.futures` to process images in parallel. If images fail to average successfully, the exceptions are caught and logged allowing other images to finish. By default only averages jpeg and png images.

Parameters

- **path** (*str*) – Path to directory.

- **image_formats** (*tuple of str, optional*) – tuple of image formats used by imghdr to determine what types of images to average. Defaults: ('jpeg', 'png')

Returns A dictionary with the following keys: name, red, green, blue.

Return type dict

Raises DirectoryAveragingError – If the directory could not be averaged.

3.1.4 imagecolor.exceptions module

imagecolor module containing all publically raised exceptions.

exception imagecolor.exceptions.DirectoryAveragingError

Bases: *imagecolor.exceptions.ImageColorException*

Raised when an directory was unable to be averaged.

exception imagecolor.exceptions.ImageAveragingError

Bases: *imagecolor.exceptions.ImageColorException*

Raised when an image was unable to be averaged.

exception imagecolor.exceptions.ImageColorException

Bases: Exception

Base Exception for all imagecolor exceptions.

exception imagecolor.exceptions.NoResultsError

Bases: *imagecolor.exceptions.ImageColorException*

Raised when a list of results is empty or invalid.

3.1.5 imagecolor.loadsave module

imagecolor functions for loading and saving results.

imagecolor.loadsave.**results_line** (*results*)

Create a line of pixels from a list of results.

Accepts a list of results and creates an image that is 1 pixel tall and the length of the number of results. The image contains a pixel of the color of each result in the list of results.

Parameters **results** (*list*) – a list of imagecolor results

Returns linear image containing the results

Return type PIL.Image.object

imagecolor.loadsave.**results_load_csv** (*path*)

Create a list of results from a csv file.

Accepts the path to a csv file formatted as follows: 'File or Folder', 'Red', 'Green', 'Blue' parses the file line by line skipping the header. Returns a list containing an list for each line in the csv. Does not do any input checks other than converting the r, g, b columns to ints.

Parameters **path** (*str*) – the path to the file to be loaded.

Returns a list of imagecolor results.

Return type list

`imagecolor.loadsave.results_rectangle(results, aspectratio=(3, 2))`

Create a rectangle of pixels from a list of results.

Accepts a list of results and creates an image that is rectangular. The aspect ratio can be set by passing a list formatted as [16,9] to `aspectratio`. The default is 3x2. The image contains a pixel of the color of each result in the list of results.

Parameters

- **results** (*list*) – a list of imagecolor results.
- **aspectratio** (*tuple of int*) – the aspect ratio of the image being created. Format (3, 2)

Returns rectangular image containing the results.

Return type PIL.Image.object

`imagecolor.loadsave.results_save_csv(results, path)`

Create a csv file from a list of results.

Accepts the path to a new csv file and a list containing results. Writes the current results to a csv file which can be re-loaded again by using `csv_to_results`. The csv created is formatted as follows: 'File or Folder', 'Red', 'Green', 'Blue'

Parameters

- **results** (*list*) – a list of imagecolor results.
- **path** (*str*) – the path to the file to be created.

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