
pyphasesym Documentation

Release 0.1

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INTRODUCTION

This is the documentation for pyphasesym: python implementation of phasesym. pyphasesym is based on Peter Kovesi's original phasesym algorithm, paper and code. The original code and papers can be obtained from Peter Kovesi's website. For more details reader is referred to Dr.Kovesi's [webpage](#)

Refer ¹ and ² for further details.

In this package we provide a modularized version of Pete's original matlab code. Preliminary unittesting is introduced in this code. This code follows PEP8 and pylint specifications.

1.1 Prerequisites

Following python modules are necessary for the use of the code:

- numpy
- scipy
- optparse
- unittest
- Image
- ImageOps

References

¹

Peter Kovesi, "Symmetry and Asymmetry From Local Phase" AI'97, Tenth Australian Joint Conference on Artificial Intelligence. 2 - 4 December

1. <http://www.cs.uwa.edu.au/pub/robvis/papers/pk/ai97.ps.gz>.

² Peter Kovesi, "Image Features From Phase Congruency". Videre: A Journal of Computer Vision Research. MIT Press. Volume 1, Number 3, Summer 1999 <http://mitpress.mit.edu/e-journals/Videre/001/v13.html>

INSTALLATION

This version of the code works on ubuntu 9.10. To install this code, download pyphasesym-1.0, untar it and execute following commands on your terminal:

```
$ sudo python setup.py install
```

This allows you to use pyphasesym package as
import pyphasesym or from pyphasesym import *

2.1 Unittesting

In this package, we provide unittesting and regression testing. For unittesting execute following command:

```
$ nosetests phasesymtests.py
```

2.2 Regression Testing

To carry out regression tests, you need matfiles with set of parameters used on original matlab code of Dr. Peter Kovesi. Obtain his code from his website. test_phasesym.m file is provided to generate testing files in matlab to carry out regression testing. To generate test matfiles, open a matlab terminal (change to appropriate directory) and then execute following command on matlab prompt:

```
$ test_phasesym(n)
```

where n is number of iterations tests you want to carry out. The test_phasesym.m file selects the parameters at random for a given range of parameters for original phasesym code and writes matfiles. Store all the matfiles in folder matfiles/ directory of pyphasesym. Some example test matfiles are provided with the package

TUTORIAL

Once installation is done, the code can be used in one of the following ways

3.1 Example 1

In python/ipython interactive shell:

```
import Image
from pyphasesym import *
import numpy as np
img = Image.open('cameraman.tif')
imarr = np.asarray(img)
phasesym, orientation = phasesym_from_array(imarr, 3, 5, 3, 2.1, 0.6, 1.3, 3, 1)
```

Similarly any other function from pyphasesym can be used. For usage, simply use docstrings. For eg in your ipyfrom shell type:

```
from pyphasesym import *
get_phasesym.__doc__
```

3.2 Example 2

On a linux terminal you can use this package in following manner

The code has a set of default values of usage. Hence, the code can be used on a terminal as

```
python pyphasesym.py <input image path> <output>
```

where <input image path> : path to input image. All the image formats that can be read by PIL can be used. <output> : this is the name of the file in which phasesym and orientation at each point in the image will be stored as numpy arrays in cPickle format.

In order to use user defined parameters for computing phasesym for a given image, use the program in following way:

```
python pyphasesym.py <input image path> <output> -s <nscale> -o <norient> -w <min_wave_length> -m <m
```

Any number of above mentioned parameters can be specified. The program contains set of defaults for each flag. Hence, a potential usage could be:

```
python main_phasesym.py cameraman.tif out -s 7 -o 4 -p 1
```

PYPHASESYM LICENSE

For original phasesym license refer Dr.Kovesi's [webpage](#)

License for python implementation of phasesym us as follows

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