

 aaren MAINT: rename pywt.misc -> pywt.data

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2 contributors  

58 lines (41 sloc) 1.69 KB

```
1  #!/usr/bin/env python
2  # -*- coding: utf-8 -*-
3
4  import numpy as np
5  import matplotlib.pyplot as plt
6
7  import pywt
8  import pywt.data
9
10
11 # Load image
12 original = pywt.data.aero()
13
14 # Wavelet transform of image, and plot approximation and details
15 titles = ['Approximation', 'Horizontal detail',
16           'Vertical detail', 'Diagonal detail']
17 coeffs2 = pywt.dwt2(original, 'bior1.3')
18 LL, (LH, HL, HH) = coeffs2
19 fig = plt.figure()
20 for i, a in enumerate([LL, LH, HL, HH]):
21     ax = fig.add_subplot(2, 2, i + 1)
22     ax.imshow(a, origin='image', interpolation="nearest", cmap=plt.cm.gray)
23     ax.set_title(titles[i], fontsize=12)
24
25 fig.suptitle("dwt2 coefficients", fontsize=14)
26
27 # Now reconstruct and plot the original image
28 reconstructed = pywt.idwt2(coeffs2, 'bior1.3')
29 fig = plt.figure()
30 plt.imshow(reconstructed, interpolation="nearest", cmap=plt.cm.gray)
31
32 # Check that reconstructed image is close to the original
33 np.testing.assert_allclose(original, reconstructed, atol=1e-13, rtol=1e-13)
34
35
36 # Now do the same with dwtn/idwt_n, to show the difference in their signatures
37
38 coeffsn = pywt.dwtn(original, 'bior1.3')
39 fig = plt.figure()
40 for i, key in enumerate(['aa', 'ad', 'da', 'dd']):
41     ax = fig.add_subplot(2, 2, i + 1)
42     ax.imshow(coeffsn[key], origin='image', interpolation="nearest",
43               cmap=plt.cm.gray)
44     ax.set_title(titles[i], fontsize=12)
45
46 fig.suptitle("dwtn coefficients", fontsize=14)
47
48 # Now reconstruct and plot the original image
49 reconstructed = pywt.idwt_n(coeffsn, 'bior1.3')
50 fig = plt.figure()
51 plt.imshow(reconstructed, interpolation="nearest", cmap=plt.cm.gray)
52
53 # Check that reconstructed image is close to the original
54 np.testing.assert_allclose(original, reconstructed, atol=1e-13, rtol=1e-13)
55
56
57 plt.show()
```