

Package ‘waveslim’

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Title Basic wavelet routines for one-, two- and three-dimensional signal processing

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Depends R (>= 2.0), stats, graphics, grDevices

ZipData no

LazyLoad yes

LazyData yes

Description Basic wavelet routines for time series (1D), image (2D) and array (3D) analysis. The code provided here is based on wavelet methodology developed in Percival and Walden (2000); Gencay, Selcuk and Whitcher (2001); the dual-tree complex wavelet transform (CWT) from Kingsbury (1999, 2001) as implemented by Selesnick; and Hilbert wavelet pairs (Selesnick 2001, 2002). All figures in chapters 4-7 of GSW (2001) are reproducible using this package and R code available at the book website(s) below.

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URL <http://www.image.ucar.edu/~whitcher/> <http://www.image.ucar.edu/~whitcher/book/>

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Usage

```
cplx2dual2D(x, J, Faf, af)
icplx2dual2D(w, J, Fsf, sf)
```

Arguments

<code>x</code>	2D array.
<code>w</code>	wavelet coefficients.
<code>J</code>	number of stages.
<code>Faf</code>	first stage analysis filters for tree i .
<code>af</code>	analysis filters for the remaining stages on tree i .
<code>Fsf</code>	last stage synthesis filters for tree i .
<code>sf</code>	synthesis filters for the preceding stages.

Value

For the analysis of `x`, the output is

<code>w</code>	wavelet coefficients indexed by <code>[[j]][[i]][[d1]][[d2]]</code> , where $j = 1, \dots, J$ (scale), $i = 1$ (real part) or $i = 2$ (imag part), $d1 = 1, 2$ and $d2 = 1, 2, 3$ (orientations).
<code>y</code>	output signal.

Author(s)

Matlab: S. Cai, K. Li and I. Selesnick; R port: B. Whitcher

References

WAVELET SOFTWARE AT POLYTECHNIC UNIVERSITY, BROOKLYN, NY <http://taco.poly.edu/WaveletSoftware/>

See Also

[FSfarras](#), [farras](#), [afb2D](#), [sfb2D](#).

Examples

```
## EXAMPLE: cplxduaal2D
x = matrix(rnorm(32*32), 32, 32)
J = 5
Faf = FSfarras()$af
Fsf = FSfarras()$sf
af = dualfilt1()$af
sf = dualfilt1()$sf
w = cplxduaal2D(x, J, Faf, af)
y = icplxduaal2D(w, J, Fsf, sf)
err = x - y
max(abs(err))
```

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