Package ‘dtt’

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Title Discrete Trigonometric Transforms
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Author Lukasz Komsta
Maintainer Lukasz Komsta <lukasz.komsta@umlub.pl>
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Description This package provides functions for 1D and 2D Discrete Cosine Transform (DCT), Discrete Sine Transform (DST) and Discrete Hartley Transform (DHT).
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Description

   This package provides functions for 1D and 2D Discrete Cosine Transform (DCT), Discrete Sine Transform (DST) and Discrete Hartley Transform (DHT).

Details
Package: dtt
Type: Package
Version: 0.1-1
Date: 2007-02-25
License: GPL version 2 or newer.

Author(s)
Maintainer: Łukasz Komsta <luke@novum.am.lublin.pl>

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**dtt**

*Discrete Trigonometric Transforms*

**Description**

Performs univariate discrete sine, cosine or Hartley transform.

**Usage**

```r
dtt(x, type = c("dct", "dst", "dht"), variant = 2, inverted = FALSE)
dct(x, variant = 2, inverted = FALSE)
dst(x, variant = 2, inverted = FALSE)
dht(x, inverted = FALSE)
```

**Arguments**

- `x`: a vector or matrix to be transformed
- `type`: type of transform. Default "dct" is discrete cosine, "dst" is discrete sine and "dht" is discrete Hartley
- `variant`: a transformation variant - 1...4 for DCT-I...DCT-IV or DST-I...DST-IV. Default is DCT-II or DST-II. Ignored when type = "dht"
- `inverted`: if the inverted transform should be performed?

**Details**

This function transforms a vector of real numbers into a vector of its DCT, DST or DHT components, of the same length.

If the `x` is a matrix, the transform goes by rows (each row of a result is a transform of corresponding row in `x`).

The `dct`, `dst` and `dht` functions are simple wrappers for choosing the type by function name.
Value
A transformed vector.

Author(s)
Lukasz Komsta

References

See Also
mvdtt, fft, mvfft

Examples
```r
x=seq(0,20,length=200)
y=x*sin(x)+cos(x)+5*cos(10*x)+rnorm(200,sd=0.1)
plot(y)
z=dct(y); z[15:200]=0; lines(dct(z,inverted=TRUE),col=2);
z=dct(y); z[21:200]=0; lines(dct(z,inverted=TRUE),col=4);
```

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mvdtt

2D Discrete Trigonometric Transforms

Description
Performs multivariate (2D) discrete sine, cosine or Hartley transform.

Usage
```r
mvdtt(x, type = c("dct", "dst", "dht"), variant = 2, inverted = FALSE)
mvdct(x, variant = 2, inverted = FALSE)
mvdst(x, variant = 2, inverted = FALSE)
mvdht(x, inverted = FALSE)
```

Arguments
- **x**: a matrix to be transformed
- **type**: type of transform. Default "dct" is discrete cosine, "dst" is discrete sine and "dht" is discrete Hartley
- **variant**: a transformation variant - 1...4 for DCT-I...DCT-IV or DST-I...DST-IV. Default is DCT-II or DST-II. Ignored when type = "dht"
- **inverted**: if the inverted transform should be performed?
Details
This function transforms a matrix of real numbers into a matrix of its DCT, DST or DHT components, of the same dimensions. It is done by so-called row-matrix algorithm.

The mvdct, mvdst and mvdht functions are simple wrappers for choosing the type by function name.

Value
A transformed matrix.

Author(s)
Lukasz Komsta

References

See Also
dtt, fft, mvfft

Examples
x = rnorm(100);
dim(x) = c(10,10);
x
mvdct(x)
mvdct(mvdct(x), inverted=TRUE)
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