Package: rasterKernelEstimates (via r-universe)

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Type Package

Title Kernel Based Estimates on in-Memory Raster Images

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BugReports https://github.com/jlisic/rasterKernelEstimates/issues

Imports raster

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Description Performs kernel based estimates on in-memory raster images from the raster package. These kernel estimates include local means variances, modes, and quantiles. All results are in the form of raster images, preserving original resolution and projection attributes.

Depends R (>= 3.1.0)

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RoxygenNote 7.1.1

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`rasterLocalCategoricalModes`
Local categorical modes for an in memory raster image

Description

`rasterLocalCategoricalModes` finds the most popular category within the weighted neighborhood of `W`.

Usage

```
rasterLocalCategoricalModes(r, W)
```

Arguments

`r`	An in memory raster image. Pixels should be whole numbers or `NA`. Pixels with non-whole number values will be coerced into whole numbers.
`W`	A matrix of weights. The modal kernel will be applied to each pixel in `r`. Dimensions must be non-zero and odd.

Details

A spatial neighborhood is calculated for each pixel in `r`. The spatial neighborhood for each pixel is defined by the weight matrix `W`, where the center of the odd dimensioned matrix `W` is identified with the target pixel. The target pixel value is replaced with the most popular value within the neighborhood weighted by `W`. Ties are handled by randomly by uniformly selecting a category amongst the tied categories. Only non-missing or neighbors with non-zero weights are used in the calculation.

Value

An in memory raster image by most popular categories.

Examples

```
r <- raster::raster( matrix(runif(81),9,9))
W <- matrix(1,3,3)
modeR <- rasterLocalCategoricalModes(r,W)
```

rasterLocalMoments *Local moments for an in memory raster image*

Description

rasterLocalMoments finds the local moments within the weighted neighborhood of W.

Usage

```
rasterLocalMoments(r, WMu, WVar = WMu, moments = 2)
```

Arguments

r	An in memory raster image.
WMu	A matrix of weights. The mean kernel will be applied to each pixel in r. Dimensions must be non-zero and odd. Only non-missing neighbors are used in the mean.
WVar	A matrix of weights. The variance kernel will be applied at each centroid. Dimensions must be non-zero and odd. Only non-missing neighbors are used in the variance. The dimensions of WVar must match WMu.
moments	The number of moments to calculate. The local spatial mean will be calculated when moments=1. The local spatial mean and variance wil be calculated when moments=2. Currently no higher moments are supported.

Value

A list of in memory raster images, one list element for each moment.

Examples

```
r <- raster::raster( matrix(rnorm(36),6,6))
W <- matrix(1,3,3)
rLocalMoments <- rasterLocalMoments(r,W)
```

rasterLocalQuantiles *Local quantiles for an in memory raster image*

Description

rasterLocalQuantiles finds the quantile within the positive valued neighborhood of W.

Usage

```
rasterLocalQuantiles(r, W, q = 50)
```

Arguments

r	An in memory raster image.
W	A matrix of weights used to specify a local neighborhood. The quantile kernel will be applied to each pixel in r. Dimensions must be non-zero and odd.
q	A quantile. This value is required to be in the inclusive interval from 0 to 100.

Details

A spatial neighborhood is calculated for each pixel in r. The spatial neighborhood for each pixel is defined by the weight matrix W, where the center of the odd dimensioned matrix W is identified with the target pixel. The target pixel value is replaced with the quantile of the neighborhood identified by W. Only non-missing or neighbors with non-zero weights are used in the calculation. Quantile calculation uses the inverse empirical CDF transform, equivalent to `stats::quantile` type=1.

Value

An in memory raster image of local quantiles.

Examples

```
r <- raster::raster( matrix(rnorm(36),6,6))
W <- matrix(1,3,3)
medianR <- rasterLocalQuantiles(r,W)
```

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rasterLocalSums *Local sums for an in memory raster image.*

Description

rasterLocalSums finds the local sum within the weighted neighborhood of W.

Usage

```
rasterLocalSums(r, W)
```

Arguments

r	An in memory raster image.
W	A matrix of weights. The sums will be applied at each centroid. Dimensions must be non-zero and odd. Only non-missing neighbors are used in the sum.

Details

A spatial neighborhood is calculated for each pixel in r. The spatial neighborhood for each pixel is defined by the weight matrix W, where the center of the odd dimensioned matrix W is identified with the target pixel. The target pixel value is replaced with the sum of all pixels within the neighborhood weighted by W. Only non-missing or neighbors with non-zero weights are used in the calculation.

Value

An in memory raster image of local sums.

Examples

```
r <- raster::raster( matrix(rnorm(36),6,6))
W <- matrix(1,3,3)
sumR <- rasterLocalSums(r,W)
```

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