Package ‘ECLRMC’

August 31, 2018

Title

Ensemble Correlation-Based Low-Rank Matrix Completion

Description

Ensemble correlation-based low-rank matrix completion method (ECLRMC) is an extension to the LRMC based methods. Traditionally, the LRMC based methods give identical importance to the whole data which results in emphasizing on the commonality of the data and overlooking the subtle but crucial differences. This method aims to overcome the equality assumption problem that exists in the current LRMS based methods. Ensemble correlation-based low-rank matrix completion (ECLRMC) takes consideration of the specific characteristic of each sample and performs LRMC on the set of samples with a strong correlation. It uses an ensemble learning method to improve the imputation performance. Since each sample is analyzed independently this method can be parallelized by distributing imputation across many computation units or GPU platforms. This package provides three different methods (LRMC, CLRMC and ECLRMC) for data imputation. There is also an NRMS function for evaluating the result. Chen, Xiaobo, et al (2017) <doi:10.1016/j.knosys.2017.06.010>.

Date

2018-08-24

Version

1.0

Depends

softImpute

License

GPL-2

LazyData

true

RoxygenNote

6.1.0

NeedsCompilation

no

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CLRM C

Takes an incomplete matrix and returns the imputed matrix using CLRM C method.

Description
Takes an incomplete matrix and returns the imputed matrix using CLRM C method.

Usage
CLRM C(x, beta = 0.1)

Arguments
x An m by n matrix with NAs
beta A value in [0,1] range. Higher beta value means comparing each row with more nearest neighbours. Default value = 0.1

Value
An m by n matrix with imputed values

References

Examples
x = matrix(c(5.1, 4.9, NA, 4.6, 3.5, 3.0, 3.2, 3.1, 1.4, NA, 1.3, 1.5), byrow = TRUE, ncol=4)
CLRM C(x, beta = 0.2)

ECLRMC
Takes an incomplete matrix and returns the imputed matrix using ECLRMC method.

Description
Takes an incomplete matrix and returns the imputed matrix using ECLRMC method.

Usage
ECLRMC(x, beta = 0.1)
LRMC

Arguments

x  
An m by n matrix with NAs

beta  
A value in [0,1] range. Higher beta value means comparing each row with more nearest neighbours. Default value = 0.1

Value

An m by n matrix with imputed values

References


Examples

x = matrix(c(UN1L, TN9L, NA, TN6L, SNUL, SN0L, SNRL, SN1L, 1NTL, NA, 1NSL, 1NU), byrow = TRUE, ncol=T)
LRMC(x, beta = 0.2)

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LRMC  
*Takes an incomplete matrix and returns the imputed matrix using LRMC method.*

Description

Takes an incomplete matrix and returns the imputed matrix using LRMC method.

Usage

LRMC(x)

Arguments

x  
An m by n matrix with NAs

Value

An m by n matrix with imputed values

References


Examples

x = matrix(c(5.1, 4.9, NA, 4.6, 3.5, 3.0, 3.2, 3.1, 1.4, NA, 1.3, 1.5), byrow = TRUE, ncol=4)  
LRMC(x)
NRMS

Normalized Root Mean Square (NRMS) value of two matrices for evaluating their similarity (lower is better)

Description

Normalized Root Mean Square (NRMS) value of two matrices for evaluating their similarity (lower is better)

Usage

NRMS(imputed, original)

Arguments

imputed: An m by n matrix
original: An m by n matrix

Value

Returns the NRMS value of the given matrices

Examples

x = matrix(c(5.1, 4.9, NA, 4.6, 3.5, 3.0, 3.2, 3.1, 1.4, NA, 1.3, 1.5), byrow = TRUE, ncol=4)
a = ECLRM(x, beta = 0.2)
b = LRMC(x)
nrms(a,b)
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