Package ‘lmds’

September 27, 2019

Type Package
Title Landmark Multi-Dimensional Scaling
Version 0.1.0
Description A fast dimensionality reduction method scaleable to large numbers of samples. Landmark Multi-Dimensional Scaling (LMDS) is an extension of classical Torgerson MDS, but rather than calculating a complete distance matrix between all pairs of samples, only the distances between a set of landmarks and the samples are calculated.
License GPL-3
Encoding UTF-8
LazyData true
Imports assertthat, dynutils (>= 1.0.3), irlba, Matrix
Suggests testthat
RoxygenNote 6.1.1
URL http://github.com/dynverse/lmds
BugReports https://github.com/dynverse/lmds/issues
Collate 'cmdscale_landmarks.R' 'select_landmarks.R' 'lmds.R'
'package.R'
NeedsCompilation no
Author Robrecht Cannoodt [aut, cre] (<https://orcid.org/0000-0003-3641-729X>, rcannood), Wouter Saelens [aut] (<https://orcid.org/0000-0002-7114-6248>, zouter)
Maintainer Robrecht Cannoodt <rcannood@gmail.com>
Repository CRAN
Date/Publication 2019-09-27 09:10:02 UTC

R topics documented:
cmdscale_landmarks ......................................................... 2
lmds ............................................................................. 2
select_landmarks ............................................................... 3
Index

| cmdscale_landmarks | Perform MDS on landmarks and project other samples to the same space |

Description

Perform MDS on landmarks and project other samples to the same space.

Usage

cmdscale_landmarks(dist_2lm, ndim = 3, rescale = TRUE, ...)

Arguments

- dist_2lm: Distance matrix between the landmarks and all the samples in original dataset.
- ndim: The number of dimensions.
- rescale: Whether or not to rescale the final dimensionality reduction (recommended).
- ...: Extra params to pass to irlba::irlba().

Value

The dimensionality reduction in the form of a ncol(dist_2lm) by ndim matrix.

Examples

library(Matrix)
x <- as.matrix(iris[,1:4])
dist_2lm <- select_landmarks(x)
cmdscale_landmarks(dist_2lm)

lmds

Landmark MDS

Description

A fast dimensionality reduction method scaleable to large numbers of samples. Landmark Multi-Dimensional Scaling (LMDS) is an extension of classical 'Torgerson MDS', but rather than calculating a complete distance matrix between all pairs of samples, only the distances between a set of landmarks and the samples are calculated.

A fast dimensionality reduction method scaleable to large numbers of samples. Landmark Multi-Dimensional Scaling (LMDS) is an extension of classical Torgerson MDS, but rather than calculating a complete distance matrix between all pairs of samples, only the distances between a set of landmarks and the samples are calculated.
Usage

```r
lmds(x, ndim = 3, distance_method = c("euclidean", "pearson",
"spearman", "cosine", "manhattan"), landmark_method = c("sample"),
um_landmarks = 500)
```

Arguments

- **x** A matrix, optionally sparse.
- **ndim** The number of dimensions.
- **distance_method** The distance metric to use. Options are "euclidean" (default), "pearson", "spearman", "cosine", "manhattan".
- **landmark_method** The landmark selection method to use. Options are "sample" (default).
- **num_landmarks** The number of landmarks to use.

Value

The dimensionality reduction in the form of an `nrow(x)` by `ndim` matrix.

Examples

```r
library(Matrix)
x <- Matrix::rsparsematrix(1000, 1000, .01)
lmds(x, ndim = 3)
```

select_landmarks

Select landmarks from dataset

Description

In addition, the distances between the landmarks and all samples are calculated.

Usage

```r
select_landmarks(x, distance_method = c("euclidean", "pearson",
"spearman", "cosine", "manhattan"), landmark_method = c("sample"),
um_landmarks = 500)
```

Arguments

- **x** A matrix, optionally sparse.
- **distance_method** The distance metric to use. Options are "euclidean" (default), "pearson", "spearman", "cosine", "manhattan".
- **landmark_method** The landmark selection method to use. Options are "sample" (default).
- **num_landmarks** The number of landmarks to use,
select_landmarks

Value

The distance matrix between the landmarks and all samples. In addition, an attribute "landmark_ix" denotes the indices of landmarks that were sampled.

Examples

library(Matrix)
x <- Matrix::rsparsematrix(1000, 1000, .01)
select_landmarks(x)
Index

cmdscale_landmarks, 2
irlba::irlba(), 2
lmds, 2
lmds-package (lmds), 2
select_landmarks, 3