

# Package ‘tidydr’

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**Title** Unify Dimensionality Reduction Results

**Version** 0.0.6

**Description** Dimensionality reduction (DR) is widely used in many domain for analyzing and visualizing high-dimensional data. 'tidydr' provides uniform output and is compatible with multiple methods, including 'prcomp', 'mds', 'Rtsne'. etc.

**Imports** cluster, ggfun, ggplot2, grid, rlang, stats, utils

**Suggests** knitr, rmarkdown, prettydoc, SingleCellExperiment, SummarizedExperiment

**VignetteBuilder** knitr

**ByteCompile** true

**License** Artistic-2.0

**URL** <https://github.com/YuLab-SMU/tidydr/>

**BugReports** <https://github.com/YuLab-SMU/tidydr/issues>

**Encoding** UTF-8

**RoxygenNote** 7.3.2

**NeedsCompilation** no

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**Repository** CRAN

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|                   |                                                           |
|-------------------|-----------------------------------------------------------|
| available_methods | List dimensionality reduction methods currently available |
|-------------------|-----------------------------------------------------------|

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**Description**

This function shows available methods that worked for `dr()` function.

**Usage**

```
available_methods(method = "all")
```

**Arguments**

method            one of 'data', 'distance' or 'all' (default)

**Value**

A character vector of available DR methods

**Author(s)**

Lang Zhou and Guangchuang Yu

**Examples**

```
available_methods()
```

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|    |    |
|----|----|
| dr | dr |
|----|----|

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**Description**

dimensional reduction

**Usage**

```
dr(data, fun, ...)
```

**Arguments**

|      |                                           |
|------|-------------------------------------------|
| data | input data                                |
| fun  | function to perform dimensional reduction |
| ...  | additional parameters passed to 'fun'     |

**Details**

This function call the user-provided function ('fun') to perform dimensional reduction on the input data ('data')

**Value**

a DrResult object, which contains 'data' (original data), 'drdata' (coordination after dimensionality reduction), eigenvalue (standard deviation explained by each dimension) and stress (evaluate the effect of dimensionality reduction)

**Author(s)**

Guangchuang Yu

**Examples**

```
x = dr(iris[,1:4], prcomp)
autoplot(x, aes(color=.group), metadata=iris$Species)
```

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dr\_extract

*dr\_extract*

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**Description**

dr\_extract generic

**Usage**

```
dr_extract(result)
```

**Arguments**

|        |                 |
|--------|-----------------|
| result | DrResult object |
|--------|-----------------|

**Value**

a list that contains components to construct a 'DrResult' object.

**Author(s)**

Guangchuang Yu

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|               |                      |
|---------------|----------------------|
| element_line2 | <i>element_line2</i> |
|---------------|----------------------|

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### Description

element\_line2 for drawing shorten axis lines

### Usage

```
element_line2(
  colour = NULL,
  size = NULL,
  linetype = NULL,
  lineend = NULL,
  color = NULL,
  arrow = NULL,
  inherit.blank = FALSE,
  id,
  xlength = 0.3,
  ylength = 0.3,
  ...
)
```

### Arguments

|               |                                                                                            |
|---------------|--------------------------------------------------------------------------------------------|
| colour        | line colour                                                                                |
| size          | line size in pts                                                                           |
| linetype      | line type                                                                                  |
| lineend       | line end style (round, butt, square)                                                       |
| color         | alias to colour                                                                            |
| arrow         | arrow specification, as created by 'grid::arrow()'                                         |
| inherit.blank | whether inherit 'element_blank'                                                            |
| id            | 1 or 2, 1 for axis.line.x.bottom and 2 for axis.line.y.left, only these two axes supported |
| xlength       | length of x axis                                                                           |
| ylength       | length of y axis                                                                           |
| ...           | additional parameters                                                                      |

### Value

element\_line2 object, which is a tailored element\_line object

### Author(s)

Guangchuang Yu

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|    |           |
|----|-----------|
| nk | <i>nk</i> |
|----|-----------|

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## Description

Choose best K (number of clusters)

## Usage

```
nk(data, k)
```

## Arguments

|      |                                          |
|------|------------------------------------------|
| data | input data (a matrix or data frame)      |
| k    | a vector of candidate number of clusters |

## Details

This function calculate the silhouette scores of each K (number of clusters). The output object can be used to choose the best K (via `summary()` or `autoplot()` methods)

## Value

a `silinfo` object, which contains 'data' (original data), 'silinfo' (silhouette scores), and k (the input k vector)

## Author(s)

Guangchuang Yu

## Examples

```
x <- nk(iris[,-5], 2:8)
summary(x)
# to visualize the average silhouette score (y axis) with k (x axis)
autoplot(x)
# to visualize a PCA plot color by the choosing k
autoplot(x, k=3)
```

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|          |                 |
|----------|-----------------|
| theme_dr | <i>theme_dr</i> |
|----------|-----------------|

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**Description**

Dimensional reduction scatter plot axis theme

**Usage**

```
theme_dr(  
  xlength = 0.3,  
  ylength = 0.3,  
  arrow = grid::arrow(length = unit(0.15, "inches"), type = "closed")  
)
```

**Arguments**

|         |                                                    |
|---------|----------------------------------------------------|
| xlength | length of x axis                                   |
| ylength | length of y axis                                   |
| arrow   | arrow specification, as created by 'grid::arrow()' |

**Value**

a theme object with shorten axes

**Author(s)**

Guangchuang Yu

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|              |                     |
|--------------|---------------------|
| theme_noaxis | <i>theme_noaxis</i> |
|--------------|---------------------|

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**Description**

theme that remove axis

**Usage**

```
theme_noaxis(...)
```

**Arguments**

|     |                          |
|-----|--------------------------|
| ... | additional theme setting |
|-----|--------------------------|

*theme\_noaxis*

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**Value**

a theme object that disable axes

**Author(s)**

Guangchuang Yu

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