Package ‘vlda’

June 26, 2020

Type Package

Title Visualization of Multidimensional Longitudinal Data

Version 1.1.5

Author Seongwon Ryu [aut, cre],
Bohui Lee [aut],
Yongseok Choi [ctb]

Maintainer Seongwon Ryu <seongwon6154@gmail.com>

Depends R (>= 3.6.0)

Imports dplyr, ggrepel, ggplot2, ggiraph, ggsci

Description Assists in producing a plot that more effectively expresses changes over time for two different types (long format and wide format) using a consistent calling scheme for longitudinal data. It provides the ability to projection supplementary information (supplementary objects and variables) that can often occur in longitudinal data to graphs, as well as provides a new interactive implementation to perform the additional interpretation, so it is also useful for longitudinal data visuals analysis (see <http://lib.pusan.ac.kr/resource/e-article/?app=eds&mod=detail&record_id=edsker.000004649097&db_id=edsker> for more information).

License MIT + file LICENSE

URL https://github.com/pnuwon/vlda

BugReports https://github.com/pnuwon/vlda/issues

Encoding UTF-8

LazyData true

RoxygenNote 7.1.0

NeedsCompilation yes

Repository CRAN

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### Description

Data comparing two drugs to treat patients suffering from depression.

### Usage

```r
data(Depression)
```

### Format

<table>
<thead>
<tr>
<th>Case</th>
<th>Diagnosis</th>
<th>Drug</th>
<th>1week</th>
<th>2weeks</th>
<th>4weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

### Details

Patients in each group were randomly assigned to standard or new drugs, and the degree of each patient suffering from depression was classified as normal or abnormal after 1 week, 2 weeks, and 4 weeks of treatment.

A data frame with 800 rows and 6 variables.
Depression_column

3 1 2 2 2 2
4 1 2 2 2 2
5 1 2 2 2 2
6 1 2 2 2 2
7 1 2 2 2 2
8 1 2 2 2 2
9 1 2 2 2 2
10 1 2 2 2 2
796 2 1 1 1 1
797 2 1 1 1 1
798 2 1 1 1 1
799 2 1 1 1 1
800 2 1 1 1 1

References

Supplementary data to be added to Depression data

Description
Artificially created data to add the degree and sex of depression after 6 weeks.

Usage
data(Depression_column)

Format
*6week.1* A value of 1 indicates that depression is "Abnormal" after 6 weeks
*6week.2* A value of 1 indicates that depression is "Normal" after 6 weeks
*sex.1* A value of 1 indicates that the gender is "Male"
*sex.2* A value of 1 indicates that the gender is "Female"

Details
As supplementary variables, for 800 patients, response at fourth time point (after 6 weeks) and gender that could affect depression were added to the columns. Indicator matrix of 800 rows and 4 dummy variables.
### Depression_row

**Supplementary data to be added to Depression data**

<table>
<thead>
<tr>
<th>6weeks.1</th>
<th>6weeks.2</th>
<th>sex.1</th>
<th>sex.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>1</td>
<td>1</td>
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<tr>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>796</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>797</td>
<td>0</td>
<td>1</td>
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</tr>
<tr>
<td>798</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>799</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>800</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Description**

Artificially generated data to add a placebo effect that affects the degree of depression.

**Usage**

```r
data(Depression_row)
```

**Format**

- **Diagnosis.1** A value of 1 indicates the "Severe" of depression
- **Diagnosis.2** A value of 1 indicates the "Mild" of depression
- **Drug.1** A value of 1 indicates that the drug being taken is a “New drug”
- **Drug.2** A value of 1 indicates that the drug being taken is a “Standard drug”
- **1week.1** A value of 1 indicates that depression is "Abnormal" after 1 week
- **1week.2** A value of 1 indicates that depression is "Normal" after 1 week
- **2week.1** A value of 1 indicates that depression is "Abnormal" after 2 weeks
- **2week.2** A value of 1 indicates that depression is "Normal" after 2 weeks
- **4week.1** A value of 1 indicates that depression is "Abnormal" after 4 weeks
- **4week.2** A value of 1 indicates that depression is "Normal" after 4 weeks
Details

Supplementary 100 objects are patients who take placebo.
Indicator matrix of 100 rows and 10 dummy variables

<table>
<thead>
<tr>
<th></th>
<th>Diag.1</th>
<th>Diag.2</th>
<th>Drug.1</th>
<th>Drug.2</th>
<th>. . .</th>
<th>2week.2</th>
<th>4week.1</th>
<th>4week.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>. . .</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>. . .</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>. . .</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>. . .</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
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<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
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<td>0</td>
<td>0</td>
<td>. . .</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>. . .</td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>. . .</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>96</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>. . .</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>97</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>.</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>98</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>. . .</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>99</td>
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<td>0</td>
<td>1</td>
</tr>
<tr>
<td>100</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>. . .</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**indicator**

**Indicator matrix**

**Description**

Convert values of categorical variables into indicator matrix

**Usage**

`indicator(x)`

**Arguments**

- `x` A data frame of categorical data coded in numbers.

**Value**

Dummy_variables
Examples

```r
## Long form
data(PTSD)
PTSD <- as.data.frame(PTSD)
# Transform a string or continuous class variable into factor
PTSD[,2:4] <- apply(PTSD[,2:4], 2, function(x) ifelse(x >= 3, 1, 0))
PTSD[,5] <- ifelse(PTSD[,5] >= 6, 1, 0)
PTSD <- data.frame(lapply(PTSD[,-1], function(x) as.factor(x))
indicator(PTSD)

## Wide form
data(Depression)
str(Depression)
indicator(Depression[,-1])
```

print.vlda

Print a vlda object

Description

Print method for vlda

Usage

```r
## S3 method for class 'vlda'
print(x, ...)
```

Arguments

- `x` A vlda object to print
- `...` Other arguments not used by this method

Value

Invisibly returns the result of vlda, which is a list of components that contain the data itself, information etc.
Post Traumatic Stress Disorder data

Description

This data of 316 patients who survived the fire, each patient was measured at 3, 6 and 12 months after the fire.

Usage

data(PTSD)

Format

subject Patient number
control Self-control (A numeric vector)
problems The number of life problems (A numeric vector)
stress The number of stress events (A numeric vector)
cohesion Family cohesion (A numeric vector)
time Measured at 3, 6 and 12 months after the fire (1: 3 months, 2: 6 months, 3: 12 months)
ptsd Post traumatic stress disorder, Outcome variable (Categorical vector) (0: No, 1: Yes)

Details

Control, problems, and stress were divided into upper and lower levels based on 3, and cohesion was divided into upper and lower levels based on 6. (0: Low, 1: high)

A data frame with 948 rows and 7 variables

<table>
<thead>
<tr>
<th>subject</th>
<th>control</th>
<th>problems</th>
<th>stress</th>
<th>cohesion</th>
<th>time</th>
<th>ptsd</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
<td>3.22</td>
<td>5.62</td>
<td>1</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>3.17</td>
<td>5.38</td>
<td>0</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>3.28</td>
<td>3.75</td>
<td>1</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>2.56</td>
<td>9.25</td>
<td>0</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>3.44</td>
<td>4.38</td>
<td>0</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>18</td>
<td>3.33</td>
<td>2.38</td>
<td>0</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>19</td>
<td>2.72</td>
<td>7.75</td>
<td>1</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>19</td>
<td>2.78</td>
<td>7.75</td>
<td>1</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>19</td>
<td>2.78</td>
<td>7.50</td>
<td>1</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>943</td>
<td>570</td>
<td>3.72</td>
<td>2.75</td>
<td>0</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>944</td>
<td>570</td>
<td>3.89</td>
<td>2.25</td>
<td>0</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>945</td>
<td>570</td>
<td>3.67</td>
<td>1.25</td>
<td>0</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>946</td>
<td>571</td>
<td>3.56</td>
<td>3.00</td>
<td>0</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>947</td>
<td>571</td>
<td>2.94</td>
<td>1.88</td>
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<td>7</td>
<td>2</td>
</tr>
<tr>
<td>948</td>
<td>571</td>
<td>3.50</td>
<td>2.75</td>
<td>0</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>
Source

Allison (1991, chapter 8).

References


**PTSD_column**

Supplementary data to be added to PTSD data

**Description**

Artificially created data to add drinking level to PTSD data.

**Usage**

data(PTSD_column)

**Format**

- **Drinking.0** A value of 1 indicates that the degree of drinking is low
- **Drinking.1** A value of 1 indicates that the degree of drinking is high

**Details**

The degree of drinking (low, high) that can affect PTSD is added to the columns corresponding to the first to third time points for 316 patients.

Indicator matrix of 948 rows and 2 dummy variables.

<table>
<thead>
<tr>
<th></th>
<th>Drinking.0</th>
<th>Drinking.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
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<td>0</td>
<td>1</td>
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<tr>
<td>10</td>
<td>1</td>
<td>0</td>
</tr>
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<td>.</td>
<td>.</td>
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<tr>
<td></td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>944</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>945</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>946</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Description
Artificially created data to add variables after 18 months to PTSD data.

Usage
data(PTSD_row)

Format
control.0 A value of 1 indicates low control
control.1 A value of 1 indicates high control
problems.0 A value of 1 indicates that the degree of problems is low
problems.1 A value of 1 indicates that the degree of problems is high
stress.0 A value of 1 indicates that the degree of stress is low
stress.1 A value of 1 indicates that the degree of stress is high
cohesion.0 A value of 1 indicates that the degree of stress is low
cohesion.1 A value of 1 indicates that the degree of stress is high
time.1 Zero vector (All elements is zero)
time.2 Zero vector (All elements is zero)
time.3 Zero vector (All elements is zero)
ptsd.0 A value of 1 indicates a low post-traumatic stress disorder
ptsd.1 A value of 1 indicates a high post-traumatic stress disorder

Details
This data is a long form of control, problem, stress, stress, stress and PTSD added to the row, and is intended for 316 patients after 18 months. Indicator matrix of 316 rows and 13 dummy variables.

<table>
<thead>
<tr>
<th></th>
<th>control.0</th>
<th>control.1</th>
<th>.</th>
<th>.</th>
<th>time.1</th>
<th>time.2</th>
<th>time.3</th>
<th>ptsd.0</th>
<th>ptsd.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
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<td>1</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
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</tr>
<tr>
<td>5</td>
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<td></td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>
Respiratory

Patient's respiratory status data

Description
This is part of the data on the patient’s respiratory status.

Usage
data(Respiratory)

Format

subject  Number of patients
gender   Patient gender ( 0 : Female, 1 : Male )
age      Patient age ( 0 : Under 30, 1 : Over 30 )
month    Measurement time ( 0 : before, 1 : 1 month, 2 : 2months )
status   Measurement status after taking placebo, response variable ( 0 : poor, 1 : good )

Details
57 patients were measured for good and bad by taking 3 measurements before, 1 and 2 months after taking placebo A data frame with 171 rows and 5 variables

<table>
<thead>
<tr>
<th>subject</th>
<th>gender</th>
<th>age</th>
<th>month</th>
<th>status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
vlda

Visualization of Longitudinal Data Analysis

Description

Visualization of multidimensional longitudinal data based on the projection method using the indicator matrix.

Usage

vlda(x, object, time, type = c("long", "wide"))

Arguments

x
A data frame consisting of categorical data coded in numbers. Its n samples(object) should have been repeatedly measured through multiple time points; its p variables will be represented as variable coordinate. To keep track of which observation occurred in which time point, you must have included a variable, Time.

object
A vector of length n samples. The object who would have made repeatedly measure through multiple time points; the object is indicated by the name of the observation coordinate.

time
A time point of longitudinal data. Accepts a character string that denotes the name of the time variable.

type
A type of longitudinal data.

Source

Davis. (1977).

References

Details

The value returned by vlda is using as the main argument of vlda_plot and vlda_add function, the corresponding model. long-format is that each row is one time point per object. So each object has T rows. All T values for each object are stacked—they’re all in the one column; wide-format is that a object repeated responses will be in a single row, and each response is in a separate column. so \( (Y_1, \ldots, Y_T) \) are the response variables obtained at time \( t(= 1, \ldots, T) \).

Value

- **obs.coordinate**: A tibble data class of row coordinates. Each row represents row coordinates and the observations corresponding to each row are included in the obs_list.
- **var.coordinate**: The column coordinate.
- **Eigen**: Summarize the principal inertias (Eigenvalues) that as a result of applying the above algorithm using the indicator matrix.
- **GOF**: Goodness-of-fit of the Approximation for 2-dimensional VLDA plot.

See Also

- vlda_add
- vlda_plot

Examples

```r
## longform of the PTSD data
data(PTSD)
PTSD <- as.data.frame(PTSD)
PTSD[,2:4] <- apply(PTSD[,2:4], 2, function(x) ifelse(x >= 3, 1, 0))
PTSD[,5] <- ifelse(PTSD[,5] >= 6, 1, 0)
PTSD <- data.frame(lapply(PTSD, function(x) as.factor(x))
vlda(x = PTSD, object = "subject", time = "time", type = "long")

## Wideform od the Depression data
data(Depression)
head(Depression)
vlda(Depression, object = "Case", time = c("1week", "2weeks", "4weeks"), type = "wide")
vlda(Depression, "Case", c("1week", "2weeks", "4weeks"), "wide")
```

Description

Add objects or variables with new information to the two-dimensional VLDA plot proposed for multidimensional longitudinal data.
Usage

vlda_add(fit, add.col = NULL, add.row = NULL, time.name = NULL)

Arguments

fit        An object returned by vlda()
add.col    A data matrix, The type of indicator matrix. Additional data sets in column format. \( p \geq 2 \)
add.row    A data matrix, The type of indicator matrix. Additional data sets in row format. Supplemental data should have the same variable name as fit$ind.mat returned by vlda, and if it is not an indicator matrix, you can use it after generate an indicator matrix using indicator function built into vlda.
time.name  If supplemental data to add contains a time variable, it requires argument a character string that specifies the name of the time variable.

Details

The longitudinal data inevitably has the characteristic that supplementary data is added such as:

* Outcome variables measured at additional time points, such as \( T + 1, T + 2, \ldots \) after the last time point \( T \).
* New objects that are not previously measured.
* Other covariates that indicate the characteristics of objects.

Find coordinates representing objects and variables that are added in the VLDA plot already provided, through a method obtain that find coordinates on low-dimensional space for supplementary elements.

Value

... Same as the result of vlda
sup.coordinate A tibble data class. The coordinates of the new object created when adding supplemental data to the already provided vlda plot.

See Also

vlda

Examples

#### Supplementary row and column indicator matrix added ####
### long form ###
data(PTSD)
PTSD <- as.data.frame(PTSD)
PTSD[,2:4] <- apply(PTSD[,2:4], 2, function(x) ifelse(x >= 3, 1, 0))
PTSD[,5] <- ifelse(PTSD[,5] >= 6 , 1, 0)
PTSD <- data.frame(lapply(PTSD, function(x) as.factor(x)))
fit <- vlda(x = PTSD, object = "subject", time = "time", type = "long")
data(PTSD_column) # The degree of drinking that may affect PTSD
PTSD_column <- as.matrix(PTSD_column)

data(PTSD_row) # Added to the row, and is intended for 316 patients after 18 months.
PTSD_row <- as.matrix(PTSD_row)

vlda_add(
fit,
add.row = PTSD_row,
add.col = PTSD_column
)

### Wide form ###
data(Depression)
fit2 <- vlda(x = Depression, object = "Case", time = c("1week", "2weeks", "4weeks"), type = "wide")

# Response after 6 weeks and gender were added columns for 800 existing patients.
data(Depression_column)
Depression_column <- as.matrix(Depression_column)

# 100 patients who took placebo in each group of mild and severe were added to the rows.
data(Depression_row)
Depression_row <- as.matrix(Depression_row)

vlda_add(
fit2,
time.name = "6weeks",
add.row = Depression_row,
add.col = Depression_column
)

---

**vlda_plot**  

**VLDA Plot**

**Description**

Assists in producing a plot that more effectively expresses changes over time for two different types (long format and wide format) using a consistent calling scheme for longitudinal data. It provides the ability to projection supplementary information (supplementary objects and variables) that can often occur in longitudinal data to graphs, as well as provides a new interactive implementation to perform the additional interpretation, so it is also useful for longitudinal data visuals analysis.
Usage

vlda_plot(fit, rename = NULL, interactive = TRUE, title = NULL, title.col = NULL, title.size = 15, title.hjust = 0, subtitle = NULL, sub.col = NULL, sub.size = 15, sub.hjust = 0, labels = NULL, lab.col = NULL, lab.size = NULL, lab.face = NULL, legend.position = "bottom", legend.justification = NULL, linetype = 2, line.col = "red", font.size = 1.0, var.size = 2.5, obs.col = "darkgray", obs.size = 2.5, add.obs.col = "#666666", arrow.col = "orange", arrow.size = 0.5, arrow.type = "closed")

Arguments

fit
An object returned by vlda() or supplement()

rename
Rename a variable to another name

interactive
Use the interactive graphical elements (default TRUE)

title
Plot title. If NULL, the title is not shown (default NULL)

title.col
Title color (default color is black)

title.size
Title font size (default size = 15)

title.hjust
Alignment of title (Number from 0 (left) to 1 (right): left-aligned by default)

subtitle
Subtitle for the plot which will be displayed below the title

sub.col
Sub-title color (default color is black)

sub.size
Sub-title font size (default size = 15)

sub.hjust
Alignment of sub-title (Number from 0 (left) to 1 (right): left-aligned by default)

labels
Legend labels

lab.col
Legend labels color

lab.size
Legend labels size

lab.face
Legend labels font c("plain","bold","italic","bold.italic") default = "plain"

legend.position
The position of legends ("none","left","right","bottom","top", or two-element numeric vector) default is "bottom"

legend.justification
Anchor point for positioning legend inside plot ("center" or two-element numeric vector) or the justification according to the plot area when positioned outside the plot

linetype
Line types can be specified with: An integer or name: 0 = blank, 1 = solid, 2 = dashed, 3 = dotted, 4 = dotdash, 5 = longdash, 6 = twodash, as shown below:

line.col
Axis line color

font.size
Font size (left-aligned by default size = 1.0)

var.size
Variable coordinate point size of plot

obs.col
Observation coordinate point color of plot
obs.size  Observation coordinate point size on plot
add.obs.col  Color of added observation coordinate points
arrow.col  Arrow color (default color = "orange")
arrow.size  Arrow size (default size = 0.5)
arrow.type  One of "open" or "closed" indicating whether the arrow head should be a closed triangle

Details

Coordinates in opposite directions on each axis can be considered to be different groups. And if the distance between the coordinates is close, it indicates that the group has a similar tendency. Even if the explanatory variable is not significant, a small tendency can confirm because the coordinate is placed in consideration of the relative influence.

Value

...  Same as the result of vlda

graphics  As a result of vlda, it creates a two-dimensional graph. provides interactive graphics, so when the mouse cursor points to the observation coordinates, it provides a tooltip that displays observations of having the same coordinates and displays the row and column coordinate. In the case of long-form, the tooltip displays a time point, besides, coordinate having the same time point are filled with the yellow color on the graph, to make it easier to distinguish the same time points of observations with colors. In the case of a wide form, the combinations that the explanatory variables can have are grouped and the coordinates points of the corresponding observations are shown in yellow on the graph. changes in time points are indicated by orange arrows on the graph.

See Also

vlda

Examples

### Long form ###
data(PTSD)
PTSD[,2:4] <- apply(PTSD[,2:4], 2, function(x) ifelse(x >= 3, 1, 0))
PTSD[,5] <- ifelse(PTSD[,5] >= 6, 1, 0)
PTSD <- data.frame(lapply(PTSD, function(x) as.factor(x)))
PTSD
str(PTSD)
head(PTSD, 10)
fit <- vlda(x = PTSD, object = "subject", time = "time", type = "long")
vlda_plot(fit)

## row and column ##
data(PTSD_row)
data(PTSD_column)
PTSD_row <- as.matrix(PTSD_row)
PTSD_column <- as.matrix(PTSD_column)

fit2 <- vlda_add(fit, add.row = PTSD_row, add.col = PTSD_column)
vlda_plot(fit2)

### Wide form ###
data(Depression)
wide.fit <-
vlda(
  x = Depression,
  object = "Case",
  time = c("1week", "2weeks", "4weeks"),
  type = "wide"
)
vlda_plot(wide.fit)
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