

Package ‘TripleSec’

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Type Package

Title The Triple Sec algorithm (AD)

Version 1.0.6

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Description

The Triple Sec Algorithm is a clinical support algorithm for risk assessment of Alzheimers disease. Its goal is to categorize patients with neurological symptoms into three categories. These three categories, high risk, low risk and indiscriminate, represent the risk of the patient progressing to Alzheimer's disease, dependent on the given biomarker values. The categories are defined by cutoff values of the biomarkers. These cutoff values are calculated dependent on user defined risk-threshold and ratio of patients. The algorithm is made up of three functions: CV.one.prune.tree, design.tree and predictTree. The data, data parameters as well as the risk-threshold are given to CV.one.prune.tree. This function creates a table with all data and splits this in half, using the first half of the data to calculate the cutoff values, via design.tree and using the second half of the data to test the cutoff values via the function predict.tree. Once predictTree has returned the predictions for the data given, CV.one.prune.tree returns a table with the predicted data to the user including a column for the prediction as well the accuracy and the effectiveness.

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Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Suggests knitr,
rmarkdown

VignetteBuilder knitr

Imports readr

R topics documented:

calCutOff	2
predictTree	2
predictTreeRec	3
prepareData	3
pruneTree	4

Index**5**

calCutOff	<i>This function is used to calculate the cut off values for low-risk and high-risk groups. The values are calculated by the proportion between converters with a value and all patients having this certain value corresponding with the given pHigh and pLow values. For each feature cutoff calculation all patients that have not been categorized into the high or low risk categories will be used.</i>
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Description

This function is used to calculate the cut off values for low-risk and high-risk groups. The values are calculated by the proportion between converters with a value and all patients having this certain value corresponding with the given pHigh and pLow values. For each feature cutoff calculation all patients that have not been categorized into the high or low risk categories will be used.

Usage

```
calCutOff(inputData, pHigh, pLow)
```

Arguments

inputData	input data given by the user (type: data.frame)
pHigh	risk-threshold, defined by the user (type: double, value between 0 and 1)
pLow	risk-threshold, defined by the user (type: double, value between 0 and 1)

Value

fit, a variable which contains links to the calculated cutOff table, filtered data and effectiveness of the cutOff values

predictTree	<i>This function calls the recursive function predictTreeRec. The function returns a variable with a link to a patient data table containing their risk assessments and a link to the average cutoff value matrix.</i>
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Description

This function calls the recursive function predictTreeRec. The function returns a variable with a link to a patient data table containing their risk assessments and a link to the average cutoff value matrix.

Usage

```
predictTree(cutOff, inputData)
```

Arguments

cutOff	the calculated cutOff values for each parameter (type: matrix)
inputData	the inputData / patient, that the previously calculated cutOff values are tested on (type: matrix)

Value

result, variable result with its links to the cutOff matrix and predicted patient information

predictTreeRec	<i>predictTreeRec This recursive function calculates the cutoff value for each parameter dependent upon the patient ratio, it also verifies if the model is effective (cut_high > cut_low).</i>
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Description

predictTreeRec This recursive function calculates the cutoff value for each parameter dependent upon the patient ratio, it also verifies if the model is effective (cut_high > cut_low).

Usage

```
predictTreeRec(cutOff, inputData)
```

Arguments

cutOff	the calculated cutOff values for each parameter (type: matrix)
inputData	the inputData / patient, that the previously calculated cutOff values are tested on (type: matrix)

Value

result, variable result with its links to the cutOff matrix and predicted patient information

prepareData	<i>This function transforms the given data into a data frame containing only the columns necessary for the TripleSec algorithm, therefor for the risk assessment.</i>
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Description

This function transforms the given data into a data frame containing only the columns necessary for the TripleSec algorithm, therefor for the risk assessment.

Usage

```
prepareData(data, firstFeature, featureList)
```

Arguments

data	the data table with patients and all available data
firstFeature	the first Feature which should be set
featureList	the other features, excluding the first feature

Value

inputData, data table including only all relevant information for the Triple Sec algorithm

pruneTree	<i>This function divides the given input data frame into training and test data. It calls the function calCutOff for the training data, which returns a matrix containing the calculated cut off values. Using this matrix and the test data, pruneTree then calls predictTree. predictTree returns the risk assessment for the test data to pruneTree.</i>
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Description

This function divides the given input data frame into training and test data. It calls the function [calCutOff](#) for the training data, which returns a matrix containing the calculated cut off values. Using this matrix and the test data, pruneTree then calls [predictTree](#). [predictTree](#) returns the risk assessment for the test data to pruneTree.

Usage

```
pruneTree(inputData, pHigh, pLow)
```

Arguments

inputData	input data table, given by the user (should be a data frame)
pHigh	risk-threshold, defined by the user (should be a percentage value!)
pLow	risk-threshold, defined by the user (should be a percentage value!)

Value

result, a variable with a link to the average cutoff values for each feature and a table data with the patients and feature and their risk assessment

Index

calCutOff, [2](#), [4](#)

predictTree, [2](#), [4](#)

predictTreeRec, [3](#)

prepareData, [3](#)

pruneTree, [4](#)