Package 'cpath'

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Type Package

Title Explaining black-box models through counterfactual paths and conditional permutations

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Depends R (>= 3.5.0)

Imports ranger,
igraph,
ModelMetrics,
dplyr,
tidyr,
ggplot2

Description Explaining black-box models through counterfactual paths and conditional permutations.

License GPL (>= 3)

LazyLoad yes

Encoding UTF-8

Suggests testthat (>= 3.0.0), hedgehog (>= 0.1.0), stringr

RoxygenNote 7.2.3

R topics documented:

cpath 2
cpaths 2
cpaths_mc 3
get_cpath_summary 4
importance 4
plot_paths 5
transition 6

Index **7**

cpath *Counterfactual single path generation*

Description

Counterfactual single path generation

Usage

```
cpath(model, test_set, k, graph = NaN, nearest = FALSE)
```

Arguments

model	The classifier to be explained
test_set	The test set for which explanations should be generated. The samples as rows and the features as columns.
k	The maximum length of the perturbation path
graph	A graph structure of the features (igraph object). default=NaN
nearest	Computes minimal perturbation paths (CPATH_min). default=FALSE

Value

The counterfactual paths and the fraction of swapped classes.

Examples

```
NaN
```

cpaths *Counterfactual multiple path generation*

Description

Counterfactual multiple path generation

Usage

```
cpaths(model, data, k = 4, n_paths = 1000, graph = NaN, nearest = FALSE)
```

Arguments

model	The classifier to be explained
data	The test set for which explanations should be generated. The samples as rows and the features as columns.
k	The maximum length of the perturbation path
n_paths	Number of samples paths (default=1000)
graph	A graph structure of the features (igraph object). default=NaN
nearest	Computes minimal perturbation paths (CPATH_min). default=FALSE

Value

The counterfactual paths and the fraction of swapped classes.

Examples

```
NaN
```

---

cpaths_mc *Multiple core Counterfactual path generation*

Description

Multiple core Counterfactual path generation

Usage

```
cpaths_mc(
  model,
  data,
  k = 4,
  n_paths = 1000,
  graph = NaN,
  ncores = NaN,
  nearest = FALSE
)
```

Arguments

model	The classifier to be explained
data	The test set for which explanations should be generated. The samples as rows and the features as columns.
k	The maximum length of the perturbation path
n_paths	Number of samples paths (default=1000)
graph	A graph structure of the features (igraph object). default=NaN
ncores	Number of cores used for computation
nearest	Computes minimal perturbation paths (CPATH_min). default=FALSE

Value

The counterfactual paths and the fraction of swapped classes.

Examples

```
NaN
```

`get_cpath_summary` *Visualization summary for the counterfactual paths*

Description

Visualization summary for the counterfactual paths

Usage

```
get_cpath_summary(cpaths, only_counterfactual = TRUE)
```

Arguments

`cpaths`	The object returned by the function cpaths().
`only_counterfactual`	TRUE when only counterfactuals should be considered

Value

aggregated results for efficient visualization

Examples

```
NaN
```

`importance` *Feature importances*

Description

Feature importances

Usage

```
importance(Tran, agg_type = "matrix")
```

Arguments

Tran	Transition matrix returned by the function trans().

Value

Feature importance values

Examples

```
NaN
```

---

plot_paths *Visualization of the counterfactual paths*

Description

Visualization of the counterfactual paths

Usage

```
plot_paths(
  cpath_summary,
  n_paths = 50,
  min_length = 2,
  count_threshold = 0,
  column_names = NULL
)
```

Arguments

n_paths	Number of paths to be displayed
min_length	Minimum length of paths
count_threshold	Number of paths
column_names	Feature names
cpaths_summary	The object returned by cpath_summary().

Value

NaN

Examples

```
NaN
```

`transition` *Computes the feature transition matrix*

Description

Computes the feature transition matrix

Usage

```
transition(cpaths)
```

Arguments

`cpaths`	The object returned by the function cpaths().

Value

The feature transition matrix

Examples

```
NaN
```

Index

cpath, 2
cpaths, 2
cpaths_mc, 3

get_cpath_summary, 4

importance, 4

plot_paths, 5

transition, 6