

Package ‘interpret’

July 22, 2025

Title Fit Interpretable Machine Learning Models

Version 0.1.34

Date 2024-11-28

Description Package for training interpretable machine learning models. Historically, the most interpretable machine learning models were not very accurate, and the most accurate models were not very interpretable. Microsoft Research has developed an algorithm called the Explainable Boosting Machine (EBM) which has both high accuracy and interpretable characteristics. EBM uses machine learning techniques like bagging and boosting to breathe new life into traditional GAMs (Generalized Additive Models). This makes them as accurate as random forests and gradient boosted trees, and also enhances their intelligibility and editability. Details on the EBM algorithm can be found in the paper by Rich Caruana, Yin Lou, Johannes Gehrke, Paul Koch, Marc Sturm, and Noemie Elhadad (2015, <doi:10.1145/2783258.2788613>).

URL <https://github.com/interpretml/interpret>

BugReports <https://github.com/interpretml/interpret/issues>

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Depends R (>= 3.0.0)

NeedsCompilation yes

SystemRequirements C++17

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Repository CRAN

Date/Publication 2024-11-28 11:40:08 UTC

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ebm_classify	<i>Build an EBM classification model</i>
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Description

Builds a classification model

Usage

```
ebm_classify(  
  X,  
  y,  
  max_bins = 255,  
  outer_bags = 16,  
  inner_bags = 0,  
  learning_rate = 0.01,  
  validation_size = 0.15,  
  early_stopping_rounds = 50,  
  early_stopping_tolerance = 1e-4,  
  max_rounds = 5000,  
  min_hessian = 1e-3,  
  max_leaves = 3,  
  random_state = 42  
)
```

Arguments

X	features
y	targets
max_bins	number of bins to create
outer_bags	number of outer bags
inner_bags	number of inner bags
learning_rate	learning rate
validation_size	amount of data to use for validation
early_stopping_rounds	how many rounds without improvement before we quit
early_stopping_tolerance	how much does the round need to improve by to be considered as an advance- ment
max_rounds	number of boosting rounds

<code>min_hessian</code>	minimum hessian required for a split
<code>max_leaves</code>	how many leaves allowed
<code>random_state</code>	random seed

Value

Returns an EBM model

Examples

```
data(mtcars)
X <- subset(mtcars, select = -c(vs))
y <- mtcars$vs

set.seed(42)
data_sample <- sample(length(y), length(y) * 0.8)

X_train <- X[data_sample, ]
y_train <- y[data_sample]
X_test <- X[-data_sample, ]
y_test <- y[-data_sample]

ebm <- ebm_classify(X_train, y_train)
```

<code>ebm_predict_proba</code>	<i>ebm_predict_proba</i>
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Description

Predicts probabilities using an EBM model

Usage

```
ebm_predict_proba(
  model,
  X
)
```

Arguments

<code>model</code>	the model
<code>X</code>	features

Value

returns the probabilities predicted

Examples

```

data(mtcars)
X <- subset(mtcars, select = -c(vs))
y <- mtcars$vs

set.seed(42)
data_sample <- sample(length(y), length(y) * 0.8)

X_train <- X[data_sample, ]
y_train <- y[data_sample]
X_test <- X[-data_sample, ]
y_test <- y[-data_sample]

ebm <- ebm_classify(X_train, y_train)
proba_test <- ebm_predict_proba(ebm, X_test)

```

ebm_show

ebm_show

Description

Shows the GAM plot for a single feature

Usage

```

ebm_show(
  model,
  name
)

```

Arguments

model	the model
name	the name of the feature to plot

Value

None

Examples

```

data(mtcars)
X <- subset(mtcars, select = -c(vs))
y <- mtcars$vs

set.seed(42)
data_sample <- sample(length(y), length(y) * 0.8)

X_train <- X[data_sample, ]

```

```
y_train <- y[data_sample]
X_test  <- X[-data_sample, ]
y_test  <- y[-data_sample]

ebm <- ebm_classify(X_train, y_train)
ebm_show(ebm, "mpg")
```

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