Package ‘kernelFactory’

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Type Package
Title Kernel Factory: An ensemble of kernel Machines
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Imports randomForest, AUC, genalg, kernlab
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R topics documented:

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Credit  Credit approval (Frank and Asuncion, 2010)

Description

Credit contains credit card applications. The dataset has a good mix of continuous and categorical features.
Usage

data(Credit)

Format

A data frame with 653 observations, 15 predictors and a binary criterion variable called Response

Details

All observations with missing values are deleted.

Source


References

The original dataset can be downloaded at http://archive.ics.uci.edu/ml/datasets/Credit+Approval

Examples

data(Credit)
str(Credit)
table(Credit$Response)

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**kernelFactory**  
*Binary classification with Kernel Factory*

Description

`kernelFactory` implements an ensemble method for kernel machines (Ballings and Van den Poel, 2013).

Usage

```r
kernelFactory(x = NULL, y = NULL, cp = 1, rp = round(log(nrow(x), 10)),
              method = "burn", ntree = 500, popSize = rp * cp * 7, iters = 80,
              mutationChance = 1/(rp * cp), elitism = max(1, round((rp * cp) * 0.05)))
```

Arguments

- `x`  
  A data frame of predictors (numeric, integer or factor). Categorical variables need to be factors.

- `y`  
  A factor containing the response vector. Only \{0,1\} is allowed.

- `cp`  
  The number of column partitions.

- `rp`  
  The number of row partitions.
**method**

Can be one of the following: POLynomial kernel function (pol), LINear kernel function (lin), Radial Basis kernel Function rbf), random choice (random=pol, lin, rbf) (random), burn- in choice of best function (burn=pol, lin, rbf ) (burn). Use random or burn if you don’t know in advance which kernel function is best.

**ntree**

Number of trees in the Random Forest base classifiers.

**popSize**

Population size of the genetic algorithm.

**iters**

Number of generations of the genetic algorithm.

**mutationChance**

Mutation chance of the genetic algorithm.

**elitism**

Elitism parameter of the genetic algorithm.

**Value**

An object of class `kernelFactory`, which is a list with the following elements:

- **trn**: Training data set.
- **trnlst**: List of training partitions.
- **rbfstre**: List of used kernel functions.
- **rbfmtrx**: List of augmented kernel matrices.
- **rsltsKF**: List of models.
- **cpr**: Number of column partitions.
- **rpr**: Number of row partitions.
- **cntr**: Number of partitions.
- **wghts**: Weights of the ensemble members.
- **rmDtrn**: Vector indicating the numeric (and integer) features.
- **rngs**: Ranges of numeric predictors.

**Author(s)**

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**References**


**See Also**

`predict.kernelFactory`
Examples

# Credit Approval data available at UCI Machine Learning Repository
data(Credit)
# take subset (for the purpose of a quick example) and train and test
Credit <- Credit[1:100,]
train.ind <- sample(nrow(Credit),round(0.5*nrow(Credit)))

# Train Kernel Factory on training data
kFmodel <- kernelFactory(x=Credit[train.ind,names(Credit)!="Response"],
y=Credit[train.ind,"Response"], method="random")

# Deploy Kernel Factory to predict response for test data
predicted.response <- predict(kFmodel, newdata=Credit[-train.ind,names(Credit)!="Response"])

kFNews

Display the NEWS file

Description

kFNews shows the NEWS file of the kernelFactory package.

Usage

kFNews()

Value

None.

Author(s)

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References


See Also

kernelFactory, predict.kernelFactory

Examples

kFNews()
predict.kernelFactory  Predict method for kernelFactory objects

Description
Prediction of new data using kernelFactory.

Usage
## S3 method for class 'kernelFactory'
predict(object, newdata = NULL, ...)

Arguments
- object: An object of class kernelFactory, as created by the function kernelFactory
- newdata: A data frame with the same predictors as in the training data.
- ...: Not used currently.

Value
A vector containing the response probabilities.

Author(s)
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References

See Also
kernelFactory

Examples
#Credit Approval data available at UCI Machine Learning Repository
data(Credit)
#take subset (for the purpose of a quick example) and train and test
Credit <- Credit[1:100,]
train.ind <- sample(nrow(Credit),round(0.5*nrow(Credit)))

#Train Kernel Factory on training data
kFmodel <- kernelFactory(x=Credit[train.ind,],names(Credit)! = "Response",
y=Credit[train.ind,"Response"], method=random)

#Deploy Kernel Factory to predict response for test data
predictedresponse <- predict(kFmodel, newdata=Credit[-train.ind,],names(Credit)! = "Response")
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