Package 'rcane'

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Type Package

Title Different Numeric Optimizations to Estimate Parameter Coefficients

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Description There are different numeric optimizations which are used in order to estimate coefficients in models such as linear regression and neural networks. This package covers parameter estimation in linear regression using different methods such as batch gradient descent, stochastic gradient descent, minibatch gradient descent and coordinate descent. Kiwiel, Krzysztof C (2001) <doi:10.1007/PL00011414> Yu Nesterov (2004) <ISBN:1-4020-7553-7> Ferguson, Thomas S (1982) <doi:10.1080/01621459.1982.10477894> Zeiler, Matthew D (2012) <arXiv:1212.5701> Wright, Ste

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NeedsCompilation no

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plotLoss *plotLoss: Plot loss vs iteration graph*

Description

Plot the result of loss function vs number of iterations.

Usage

```
plotLoss(object)

## S3 method for class 'rlm'
plotLoss(object, ...)

## Default S3 method:
plotLoss(object, ...)
```

Arguments

object	an object of class rlm
...	other arguments

Methods (by class)

- rlm: Plot loss vs iteration of rlm object
- default: Plot loss vs iteration

rlm *RCANE*

Description

RCANE

Gradient descent is a first-order iterative optimization algorithm for finding the minimum of a function. bgd (Batch Gradient Descent) - Batch Gradient Descent updates the parameters by computing loss function of the entire dataset. sgd (Stochastic Gradient Descent) - Stochastic Gradient Descent updates the parametes by computing loss function for each record in the dataset. cd (Coordinate Descent) - Coordinate Descent updates the parameter by minimizing the loss function along each coordinate axis. mini-bgd (Mini Batch Gradient Descent) - Mini Batch Gradient Descent divides the data into batches and updates the parameters by computing the loss function for each batch.

Usage

```
rlm(formula, data, method = "sgd", alpha = 0.1, max.iter = 1000,
  precision = 1e-04, boldDriver = FALSE, AdaGrad = FALSE, ...)
```

Arguments

formula	an object of class "formula" (or one that can be coerced to that class): a symbolic description of the model to be fitted.
data	an optional data frame, list or environment (or object coercible by as.data.frame to a data frame) containing the variables in the model. If not found in data, the variables are taken from environment(formula), typically the environment from which lm is called.
method	the method to be used. Possible values include "bgd", "sgd", "cd" and "mini-bgd".
alpha	the learning rate - typically this would be set to the optimum value
max.iter	the maximum number of iterations - in case of delayed convergence, the function would terminate after max.iter iterations
precision	the precision of the result
boldDriver	set TRUE to use bold driver for method='bgd'
AdaGrad	set TRUE to use AdaGrad for method='sgd'
...	additional arguments to be passed to the low level regression fitting functions.

Details

rlm is an interface for the optimization functions written in the rcane project.

Examples

```
library(datasets)
rlm(mpg ~ disp, data = mtcars, alpha = 0.00001)
```

---

rlm.summaries *Accessing rlm Model Fits*

Description

All these functions are methods for class "rlm" objects.

Usage

```
## S3 method for class 'rlm'
coef(object, ...)

## S3 method for class 'rlm'
fitted(object, ...)

## S3 method for class 'rlm'
formula(x, ...)
```

```
## S3 method for class 'rlmmodel'
predict(object, newdata, ...)

## S3 method for class 'rlmmodel'
print(x, ...)

## S3 method for class 'rlm'
resid(object, ...)
```

Arguments

object, x	an object of class rlm
...	futher arguments passed to or from other methods.
newdata	An optional data frame in which to look for variables with which to predict. If omitted, the fitted values are used

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