

Package: rvfl (via r-universe)

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Title Random Vector Functional Link Networks

Version 0.3.0

Description Random Vector Functional Link Networks.

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Roxygen list(markdown = TRUE)

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survival, glmnet, nnet, ahead

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VignetteBuilder knitr

Remotes thierrymoudiki/misc, Techtonique/ahead

Config/pak/sysreqs libssl-dev

Repository <https://techtonique.r-universe.dev>

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dropout_layer	<i>Dropout Layer</i>
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Description

Applies dropout to the input data for regularization during training. The dropout rate determines the probability of retaining a unit.

Usage

```
dropout_layer(x, dropout = 0, seed = 42)
```

Arguments

x	A numeric matrix of input data.
dropout	A numeric value between 0 and 1 representing the dropout rate. Default is 0.
seed	An integer seed for random number generation. Default is 42.

Value

A matrix of the same shape as x with dropout applied.

Examples

```
# Apply dropout to a matrix
x <- matrix(runif(20), nrow = 5)
dropout_layer(x, dropout = 0.5)
```

fitted.rvf12	<i>Compute Fitted Values for RVFL2 Model</i>
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Description

Returns the fitted (predicted) values for the RVFL2 model on the given data.

Usage

```
## S3 method for class 'rvf12'
fitted(object, x)
```

Arguments

object	An object of class rvf12 (the fitted model).
x	A numeric matrix of input features (test data).

Value

A numeric vector of fitted values.

krvfl	<i>Simple and efficient implementation using the kernel trick on concatenated features</i>
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Description

Simple and efficient implementation using the kernel trick on concatenated features

Usage

```
krvfl(  
  x,  
  y,  
  lambda = 0.1,  
  nb_hidden = 100L,  
  activation = c("relu", "sigmoid", "tanh", "linear"),  
  sigma = 1,  
  seed = NULL,  
  ...  
)
```

Arguments

x	Matrix of predictors (n x p)
y	Response vector (n x 1) or matrix (n x m)
lambda	Regularization parameter
nb_hidden	Number of hidden units
activation	Activation function
sigma	Scale parameter for weights
seed	Random seed
...	Additional arguments

Value

krvfl object

predict.krvfl *Predict method for krfl objects*

Description

Predict method for krfl objects

Usage

```
## S3 method for class 'krvfl'
predict(object, newdata = NULL, ...)
```

Arguments

object	A krfl object from krfl()
newdata	Matrix of new predictors (m x p)
...	Additional arguments (unused)

Value

Predicted values (m x 1) or (m x q) matrix

predict.rvfl2 *Make Predictions with RVFL2 Model*

Description

Predicts the target values using the fitted RVFL2 model on new input data.

Usage

```
## S3 method for class 'rvfl2'
predict(object, new_x, dropout = object$dropout, seed = object$seed)
```

Arguments

object	An object of class rvfl2 (the fitted model).
new_x	A numeric matrix of input features (test data).
dropout	A numeric value between 0 and 1 representing the dropout rate. Default is the value used during training.
seed	An integer seed for random number generation. Default is the value used during training.

Value

A numeric vector of predicted target values.

print.krvfl	<i>Print method for krvgl objects</i>
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Description

Print method for krvgl objects

Usage

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

Arguments

x	A krvgl object
...	Additional arguments (unused)

residuals.rvf12	<i>Compute Residuals for RVFL2 Model</i>
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Description

Computes the residuals (observed - predicted) for the RVFL2 model on the given data.

Usage

```
## S3 method for class 'rvf12'  
residuals(object, x, y)
```

Arguments

object	An object of class rvf12 (the fitted model).
x	A numeric matrix of input features (test data).
y	A numeric vector of observed target values (test labels).

Value

A numeric vector of residuals.

rvfl	<i>rvfl</i>
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Description

Generic function for RVFL models

Usage

```
rvfl(x, ...)
```

Arguments

x	Object input
...	Additional arguments passed to methods

rvfl2	<i>Custom Regression Function (RVFL2)</i>
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Description

Fits a regression model using a Random Vector Functional Link (RVFL) network with dropout and regularization. The model includes both the original features and transformed features from a hidden layer.

Usage

```
rvfl2(
  x,
  y,
  nb_hidden = 50,
  sigma = 1,
  dropout = 0,
  seed = 42,
  lambda_1 = 0,
  lambda_2 = 0
)
```

Arguments

x	A numeric matrix of input features (training data).
y	A numeric vector of target values (training labels).
nb_hidden	An integer specifying the number of hidden units in the model. Default is 50.
sigma	A numeric value controlling the standard deviation of the initial random weights. Default is 1.

dropout	A numeric value between 0 and 1 representing the dropout rate. Default is 0.
seed	An integer seed for random number generation. Default is 42.
lambda_1	A numeric value controlling the L2 regularization on the input features. Default is 0.
lambda_2	A numeric value controlling the L2 regularization on the hidden layer features. Default is 0.

Value

A list of class rvfl2 containing the fitted model with the coefficients, hidden layer weights, and training parameters.

summary.krvfl	<i>Summary method for krfl objects</i>
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Description

Summary method for krfl objects

Usage

```
## S3 method for class 'krfl'
summary(object, ...)
```

Arguments

object	A krfl object
...	Additional arguments (unused)

summary.rvfl2	<i>Summary of RVFL2 Model</i>
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Description

Displays a summary of the RVFL2 model, including the key hyperparameters.

Usage

```
## S3 method for class 'rvfl2'
summary(object)
```

Arguments

object	An object of class rvfl2 (the fitted model).
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Value

None (prints summary information to the console).

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