Package 'Imneuron'

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Type Package

Title AI Powered Neural Network Solutions for Regression Tasks

Version 0.1.0

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Description It offers a sophisticated and versatile tool for creating and evaluating artificial intelligence based neural network models tailored for regression analysis on datasets with continuous target variables. Leveraging the power of neural networks, it allows users to experiment with various hidden neuron configurations across two layers, optimizing model performance through ``5 fold''`` or "10 fold``" cross validation. The package normalizes input data to ensure efficient training and assesses model accuracy using key metrics such as R squared (R2), Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and Percentage Error (PER). By storing and visualizing the best performing models, it provides a comprehensive solution for precise and efficient regression modeling making it an invaluable tool for data scientists and researchers aiming to harness AI for predictive analytics.

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Encoding UTF-8

LazyData true

RoxygenNote 7.2.3

Imports MLmetrics, ggplot2, neuralnet

Depends R (>= 2.10)

NeedsCompilation no

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fruit	*Fruit Characteristics*

Description

A dataset containing the yield and other attributes of fruit

- Fruit Length
- Fruit Breadth
- Fruit Size
- Fruit Weight
- Fruit Volume
- Fruit Set
- Fruit Yield

Usage

```
data(fruit)
```

Format

A data frame with 60 rows and 7 variables

Imneuron	*Fitting of AI based Neural Network Model*

Description

Fitting of AI based Neural Network Model

Usage

```
Imneuron(data, target_variable, hidden_neurons_range, cv_type = "5-fold")
```

Arguments

`data`	dataset containing the information about all the variables which are continuous in nature
`target_variable`	response variable
`hidden_neurons_range`	This is a range of values specifying the number of hidden neurons to explore in the neural network's two layers (Layer 1 and Layer 2)
`cv_type`	This argument is used to apply cross validation like "5_fold" for 5 folded cross validation and "10-fold" for 10 folded cross validation

Value

Average values of R2, RMSE, MAE, and PER across the cross-validation folds. The trained neural network models for each fold. A data frame containing the evaluation metrics for each fold

References

Jeelani, M.I., Tabassum, A., Rather, K and Gul, M. (2023). Neural Network Modeling of Height Diameter Relationships for Himalayan Pine through Back Propagation Approach. Journal of The Indian Society of Agricultural Statistics. 76(3): 169. Tabassum, A., Jeelani, M.I., Sharma,M., Rather, K R ., Rashid, I and Gul, M. (2022). Predictive Modelling of Height and Diameter Relationships of Himalayan Chir Pine. Agricultural Science Digest - A Research Journal. <doi:10.18805/ag.D-5555>

Examples

```
# 5-fold cross-validation

data(fruit)
results_5fold <- Imneuron(fruit, "Fruit.Yield", hidden_neurons_range = c(2,2), cv_type = "5-fold")
results_10fold <- Imneuron(fruit, "Fruit.Yield", hidden_neurons_range = c(2,2), cv_type = "10-fold")
```

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