

Package ‘NeuralSTATIS’

September 12, 2026

Type Package

Title Neural Network Enhanced STATIS Methodology for Three-Way Data Analysis

Version 0.1.0

Description Combines Autoencoders with the STATIS (Structuring Three-way Arrays in Statistics) methodology for dimensional reduction and visualization of multi-way data (tables x individuals x variables). Methods are based on L'Hermier des Plantes (1976) and Carrera Buri & Galindo-Villardón (2026) <<https://www.mdpi.com/1999-4893/19/8/637/pdf>>.

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Encoding UTF-8

Imports dplyr, ggplot2, ggrepel, grid, gridExtra, reticulate, stats

Suggests gganimate, gifski, testthat (>= 3.0.0)

URL <https://github.com/fcarrer/NeuralSTATIS>

BugReports <https://github.com/fcarrer/NeuralSTATIS/issues>

Config/roxygen2/version 8.0.0

NeedsCompilation no

Author Felix Miguel Carrera Buri [aut, cre]

Maintainer Felix Miguel Carrera Buri <felix.carrera@xperty.com>

Repository CRAN

Date/Publication 2026-09-12 12:30:15 UTC

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neural_statis	<i>Neural STATIS: Multivariate Analysis via Autoencoders for Three-Way Data</i>
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Description

Neural STATIS: Multivariate Analysis via Autoencoders for Three-Way Data

Usage

```
neural_statis(  
  data,  
  col_tablas,  
  col_individuos,  
  col_variables = NULL,  
  usar_keras = TRUE,  
  q_latent = 5,  
  hidden_units = c(16),  
  epochs = 200,  
  batch_size = 32,  
  seed = 123  
)
```

Arguments

data	A data frame containing multi-way data.
col_tablas	Character. Column name defining the K tables/time points.
col_individuos	Character. Column name defining the N individuals.
col_variables	Character vector (optional). Selected numerical variables.
usar_keras	Logical. Whether to use Keras autoencoder (TRUE) or fall back to PCA (FALSE).
q_latent	Integer. Number of latent dimensions.
hidden_units	Numeric vector. Architecture of hidden layers.
epochs	Integer. Training epochs for the autoencoder.
batch_size	Integer. Batch size for training.
seed	Integer. Random seed for reproducibility.

Value

An object of class `neural_statis`.

Examples

```
set.seed(123)
df_test <- data.frame(
  tabla = rep(paste0("T", 1:3), each = 20),
  ind = rep(paste0("I", 1:10), times = 6),
  var1 = rnorm(60),
  var2 = rnorm(60)
)

res <- neural_statis(
  data = df_test,
  col_tablas = "tabla",
  col_individuos = "ind",
  usar_keras = FALSE,
  q_latent = 2
)
```

plot.neural_statis *Plot Method for Neural STATIS*

Description

Draws an integrated diagnostic and analytical dashboard for a fitted `neural_statis` object, including the autoencoder architecture, training loss curve, compromise eigenvalues, interstructure factor map, correlation circle, and latent macro-trajectories.

Usage

```
## S3 method for class 'neural_statis'
plot(x, n_clusters = 4, ...)
```

Arguments

<code>x</code>	An object of class <code>neural_statis</code> .
<code>n_clusters</code>	Integer. Number of clusters for macro-trajectories (default = 4).
<code>...</code>	Additional graphical parameters passed to lower-level plotting functions.

Value

An object of class `gtable` (or `arrangelist`) invisibly, representing the combined 2x3 grid dashboard layout. Called primarily for its side effect of drawing the integrated dashboard plot.

Examples

```
set.seed(123)
df_test <- data.frame(
  tabla = rep(paste0("T", 1:3), each = 20),
  ind = rep(paste0("I", 1:10), times = 6),
  var1 = rnorm(60),
  var2 = rnorm(60)
)

res <- neural_statis(
  data = df_test,
  col_tablas = "tabla",
  col_individuos = "ind",
  usar_keras = FALSE,
  q_latent = 2
)

plot(res)
```

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