

Package ‘NESS’

March 23, 2025

Title What the Package Does (One Line, Title Case)

Version 0.0.0.9000

Description What the package does (one paragraph).

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RoxygenNote 7.2.3

R topics documented:

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NESS

NESS: Neighbor Embedding Stability Scoring

Description

Performs dimensionality reduction (t-SNE, UMAP, or PHATE) multiple times to evaluate local neighbor stability across repeated embeddings. This function is useful for evaluating the robustness of low-dimensional embeddings for high-dimensional data.

Usage

```
NESS(  
  GCP = NULL,  
  data,  
  cell_type = NULL,  
  rareness = FALSE,  
  data.name = "sc_data",  
  method = "tsne",  
  initialization = 1,  
  stability_threshold = 0.75,  
  early_stop = TRUE  
)
```

Arguments

<code>GCP</code>	Optional numeric vector of neighborhood sizes (e.g., perplexity for t-SNE). If NULL, the function generates a default sequence.
<code>data</code>	A numeric matrix or data frame with rows as observations and columns as features.
<code>cell_type</code>	Optional vector of cell type labels for coloring the embedding plots.
<code>rareness</code>	Logical; if TRUE, computes rareness metrics based on neighbor stability.
<code>data.name</code>	Character string used in plot titles to label the dataset.
<code>method</code>	Dimensionality reduction method to use. One of "tsne", "umap", or "phateR".
<code>initialization</code>	Initialization method: 1 for random, 2 for PCA.
<code>stability_threshold</code>	Quantile threshold (default = 0.75) for determining neighbor stability.
<code>early_stop</code>	Logical; if TRUE, stops early if global stability saturates.

Value

A list containing:

local_stability A list of local kNN stability scores across GCP values.

plot_list_stability A list of ggplot2 objects showing embeddings colored by stability.

global_stability_plot A ggplot2 plot showing global stability vs. GCP.

plot_list_cell_type (optional) Embedding plots colored by cell type.

rareness_mean (optional) A plot of the rareness score (mean) if rareness = TRUE.