Package 'NESS'

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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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R topics documented:

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

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