Package 'infocentroid'

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Title Information-Dense Centroid Metrics

Version 0.1.0

Description Traditional central tendency and dispersion measures such as the mean and standard deviation can be misleading for multimodal or outlier-contaminated data. This package implements information-theoretic alternatives that weight observations by their local probability density, focusing on the region containing the bulk of the data. The core functions include ic_weights() for kernel density or histogram based entropy weighting, ic_center() and ic_dispersion() for weighted location and spread, ic_combined() for a single information density score between zero and one, and ic_plot() for visualization.

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Encoding UTF-8

Imports ggplot2, ggfx

URL https://github.com/ahmetkutuk1/infocentroid

BugReports https://github.com/ahmetkutuk1/infocentroid/issues

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Contents

ic_center 2
ic_combined 2
ic_dispersion 3
ic_plot 3
ic_summary 4
ic_weights 4

Index **5**

`ic_center` *Information-Dense Centroid*

Description

Calculates the entropy-weighted center of a numeric vector.

Usage

```
ic_center(x, method = c("hist", "kde"), alpha = NULL, ...)
```

Arguments

`x`	A numeric vector.
`method`	Density estimation method.
`alpha`	Power parameter for weights.
`...`	Additional arguments passed to density().

Value

A single numeric value.

Examples

```
x <- c(rnorm(90, 0, 0.5), rnorm(10, 10, 2))
ic_center(x, method = "kde")
```

`ic_combined` *Information Density Score*

Description

Combines sharpness (inverse entropy) and signal-to-noise ratio (SNR) into a single score between 0 and 1.

Usage

```
ic_combined(x, method = c("hist", "kde"), alpha = NULL, ...)
```

Arguments

`x`	A numeric vector.
`method`	Density estimation method.
`alpha`	Power parameter for weights.
`...`	Additional arguments passed to density().

Value

A list containing the combined score and sub-components.

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ic_dispersion *Information-Dense Dispersion*

Description

Calculates the dispersion based on the same entropy-weighted distribution used in ic_center.

Usage

```
ic_dispersion(x, method = c("hist", "kde"), alpha = NULL, ...)
```

Arguments

x	A numeric vector.
method	Density estimation method.
alpha	Power parameter for weights.
...	Additional arguments passed to density().

Value

A numeric value representing dispersion.

---

ic_plot *Plot Information-Dense Centroid*

Description

Creates a futuristic, dark-themed plot comparing the classical mean with the IDC.

Usage

```
ic_plot(x, method = c("hist", "kde"), alpha = NULL, ...)
```

Arguments

x	A numeric vector.
method	Density estimation method.
alpha	Power parameter for weights.
...	Additional arguments passed to density().

Value

A ggplot object.

ic_summary *Summary of Information-Dense Centroid*

Description

Prints a comprehensive summary of classical and IC metrics, and optionally generates the plot.

Usage

```
ic_summary(x, method = c("hist", "kde"), alpha = NULL, plot = TRUE, ...)
```

Arguments

x	A numeric vector.
method	Density estimation method.
alpha	Power parameter for weights.
plot	Logical. Whether to display the plot. Default is TRUE.
...	Additional arguments passed to density().

Value

Prints summary to console and returns the plot invisibly.

ic_weights *Internal Weights Calculation*

Description

Computes the entropy-weighted distribution used by the IC metrics.

Usage

```
ic_weights(x, method = c("hist", "kde"), alpha = NULL, ...)
```

Arguments

x	A numeric vector.
method	Density estimation method.
alpha	Power parameter for weights.
...	Additional arguments passed to density().

Value

A list of values, weights, entropy, and alpha.

Index

ic_center, 2
ic_combined, 2
ic_dispersion, 3
ic_plot, 3
ic_summary, 4
ic_weights, 4