# Package 'infocentroid'

November 10, 2026

**Title** Information-Dense Centroid Metrics

**Version** 0.1.1

**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.

**License** MIT + file LICENSE

**Encoding** UTF-8

**Imports** ggplot2, ggfx

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

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

**Config/roxygen2/version** 8.1.1

**NeedsCompilation** no

**Author** Ahmet Kutuk [aut, cre]

**Maintainer** Ahmet Kutuk <ahmetkutuk@gmail.com>

**Repository** CRAN

**Date/Publication** 2026-11-10 22:30:02 UTC

## 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.

---

## 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