

# Package: RobPC (via r-universe)

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**Type** Package

**Date** 2025-02-14

**Title** Robust Panel Clustering Algorithm

**Version** 1.4

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**Description** Performs both classical and robust panel clustering by applying Principal Component Analysis (PCA) for dimensionality reduction and clustering via standard K-Means or Trimmed K-Means. The method is designed to ensure stable and reliable clustering, even in the presence of outliers. Suitable for analyzing panel data in domains such as economic research, financial time-series, healthcare analytics, and social sciences. The package allows users to choose between classical K-Means for standard clustering and Trimmed K-Means for robust clustering, making it a flexible tool for various applications. For this package, we have benefited from the studies Rencher (2003), Wang and Lu (2021) <[DOI:10.25236/AJBM.2021.031018](https://doi.org/10.25236/AJBM.2021.031018)>, Cuesta-Albertos et al. (1997) <<https://www.jstor.org/stable/2242558?seq=1>>.

**License** GPL-2

**Depends** R (>= 4.0)

**Imports** stats, trimcluster

**Encoding** UTF-8

**RoxygenNote** 7.3.2

**NeedsCompilation** no

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**Repository** <https://hsnbulut.r-universe.dev>

**RemoteUrl** <https://github.com/cran/RobPC>

**RemoteRef** HEAD

**RemoteSha** 402f9e49a3e8782f480fe64308c8430240313eab

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### Description

Robust Panel Clustering Algorithm

### Usage

```
RobPC(data, k, robclust = FALSE, trim = 0.25)
```

### Arguments

<code>data</code>	the panel data. It must be array.
<code>k</code>	the number of clusters.
<code>robclust</code>	a logical arguments. If <code>robclust=TRUE</code> , the function implements the robust panel clustering analysis. Otherwise, it implements the traditional panel clustering analysis. The default value is <code>robclust=TRUE</code> .
<code>trim</code>	numeric between 0 and 1. Proportion of points to be trimmed. The default value is 0.25.

### Details

RobPC function implements the traditional or robust panel clustering analysis without being affected by outliers in the panel data.

### Value

a list with 2 elements:

<code>clusters</code>	integer vector coding cluster membership. If <code>robclust=TRUE</code> , this vector includes codes as <code>k+1</code> to define outliers clusters.
<code>clustering_method</code>	The used clustering method which is "Robust Panel Clustering" or "Panel Clustering".

### Author(s)

Hasan BULUT <hasan.bulut@omu.edu.tr>

## References

- Bulut et al. (Unpublished). A Robust Clustering Algorithms for Panel Data.
- Wang, W., & Lu, Y. (2021). Application of clustering analysis of panel data in economic and social research based on R software. *Acad. J. Bus. Manag*, 3, 98-104.
- Cuesta-Albertos, J. A., Gordaliza, A., & Matrán, C. (1997). Trimmed k-means: an attempt to robustify quantizers. *The Annals of Statistics*, 25(2), 553-576.

## Examples

```
set.seed(123)
n_obs <- 10 # Number of observations (N)
n_time <- 5 # Number of time periods (T)
n_vars <- 3 # Number of variables (D)

data <- array(rnorm(n_obs * n_time * n_vars), dim = c(n_obs, n_time, n_vars))

# Apply the Classical Panel Clustering

result_classic <- RobPC(data,k=3,robclust = FALSE)
result_classic

# Apply the Robust Panel Clustering

result_robust<- RobPC(data,k=3,robclust = TRUE,trim=0.2)
result_robust
```

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