# RCAT

We mainly provide RCAT program for Windows Operating System (OS). Users can execute RCAT by following this tutorial.

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## Download RCAT

Users can directoly download RCAT at:

<https://github.com/lzbbest/Rhythmic-Component-Analysis-Tool/releases>

RCAT\_win.rar is Windows version.

RCAT\_py.rar is source code version.

**Fig.1**

Fig. 2.tif

## Prepare input file

File must be in CSV format (Fig.1 A):

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time(hour) | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| sample 1 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 |  | 0.7 | 0.8 | 0.9 | 1 | 1.1 | 1.2 |
| sample 2 | 0.1 |  | 0.3 | 0.4 |  | 0.6 | 0.7 | 0.8 | 0.9 |  | 1.1 |  |
| sample 3 |  | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |  |  | 1 |  | 1.2 |
| sample 4 | 0.1 | 0.2 |  | 0.4 | 0.5 |  | 0.7 | 0.8 | 0.9 | 1 |  | 1.2 |

**1st row:** time points (must be in hours)

**1st column:** samples names

**Others:** an M\*N matrix of values, which represents each of M samples has N expression values/counts over time.

\*\*\*Note: array must not contain zero values, which should be deleted.

## RCAT running steps

Double click RCAT.exe in the RCAT folder (Fig.1 B-C).

**Parameters:**

**1st number (144) :** “Points per day” represents data points collected in 24 hour (onr day). For example, we collect a data point every 10 minutes, and the total points per day are 144 points.

**2nd and 3rd number (40, 148) :** “Analysis interval” is to reduce the effect of low-quality data. Assuming that the entire time period is 0-240 hours collected in a experiment and the “Analysis interval” is set to 40-148 hours, then 40-148 hours of data points are subset from 0-240 hours.

**Steps:**

①Import file (s). User can import several files one time.

②Remove unnecessary files, or select files to analyze.

③Input parameters.

④Select to export images.

⑤Execute RCAT.

⑥Select a file to view the results.

⑦Access to the result file path.

⑧Exit.

## Output files

Results are exported as CSV format which is easy to open and analyze. And result images are saved as PNG format.

**All results.csv** contains Amp (Amplitude), Period, Phase, RAE (Relative Amplitude Error).

**Fitted data.csv** is the final curve data.

**PartA.png** is for comparing curve of "raw data" and curve of "detrend data".

**PartB.png** is for comparing curve of "detrend data" and curve of "fitted data".

\*\*\*Note: Change the interval in multiple times to get the best results.

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