# The Function of Wavelet Packet Filter

Signal denoise based on wavelet packet filter.

## Description

Wavelet packet filter returns the filtered signal. Here are three filter types, and the user can select one of them. "File Upload" is used to load the required data set, and the required parameters should be set in the "Simple Filter", "Kurtosis Filter", and "Frequency Band Filter".

## Parameter introduction

Parameter of wavelet packet filter:

* Class of Filter: Three filter types: ''Simple Filter'', ''Kurtosis Filter'', ''Frequency Band Filter''.

Simple Filter:

* Wavelet basis: Wavelet basis functions.
* Level: Decomposition level. (data type: int)

Kurtosis Filter:

* Wavelet basis: Wavelet basis functions.
* Level: Decomposition level. (data type: int)
* Nums of kurtosis: Number of kurtosis selected. (data type: int)

Frequency Band Filter:

* Wavelet basis: Wavelet basis functions.
* Sampling frequency: Sampling frequency of bearing (data type: float)
* Max: Maximum limit of filtered noise in the frequency band range. (data type: float)
* Min: Minimum limit of filtered noise in the frequency band range. (data type: float

**Functional description of the main components**

The overall view of the function of the wavelet packet filter is divided into "File Upload", "Class of Filter", "Simple Filter", "Kurtosis Filter", "Frequency Band Filter", and "Result".

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### File Upload

The uploaded data files support ".mat", ".txt", ".csv", ".xls", and ".npy" format files.



### Class of Filter

Here are three filter types: "Simple filter", "Kurtosis filter", and "Frequency band filter", and the user can select one of them.

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### Parameter

Here are three parameter fields. The user only needs to select one filter type and set the parameters in the corresponding parameter field.

### Result

After the user has selected one filter type and the software has been run, the user needs to click the "Show Result" button to display the signal diagram before and after noise reduction.

图表

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The "Download" button downloads the relevant result images and data.

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**Examples**

The process of using wavelet packet filter in signal processing to achieve noise reduction.

**Step 1: Configure the procedure**

Select "Data Processing" from the process bar on the left side of the web page.

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**Step 2: Select the function**

Select the procedure that needs to be configured from the process display area.

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The "Wavelet Packet" function is chosen for signal processing.

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**Step 3: Upload the data file**

Select the data file to be applied from the local path.



Click "Upload" after successfully selecting the upload data file.

**Step 4: Set and save the parameters**

Firstly, the user needs to select one filter type in "Class of Filter". Then set parameters in the corresponding parameter field.

1. Simple Filter:

Firstly, the user needs to select one wavelet base in "Wavelet basis". Then set the parameter in "Level".

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1. Kurtosis Filter:

Firstly, the user needs to select one wavelet base in "Wavelet basis". Then set the parameters in "Level" and "Nums of kurtosis".

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1. Frequency Band Filter:

Firstly, the user needs to select one wavelet base in "Wavelet basis". Then set the parameters in "Sampling frequency", "Max" and "Min".

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Finally, click "Save" after all parameters are configured.

**Step 5: Execute the configured procedure**

Before executing the configured function, the user also needs to set the selected output image and file format.

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Finally, select "Run".

**Step 6: Show the result**

**图形用户界面

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When the progress bar reaches the end, the task is completed.

**图片包含 文本

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Select "Show Result" to simply view the graphical results of the function.

图表

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The displayed result graph is the signal diagram before and after noise reduction for one of the three filter types.

**Step 7: Download**

Click "Download" to download the file of data and image.

