# Function of EMD

Feature extraction based on EMD.

## Description

Result = EMD returns the frequency feature of the signal. "Data Upload" is used to load the required data set and label set, and the required parameters should be set in the "Parameter".

## Parameter introduction

Parameters of EMD:

Sample parameter:

* Fs: Sampling frequency. (data type: int)
* Fault Type: Type of bearing failure: BPFO (Ball Passing Frequency of Outer Race), BPFI (Ball Passing Frequency of Inner Race), BSF (Ball Spin Frequency), FTF (Fundamental Train Frequency).

Bearing parameter:

* Fr: Rotation frequency of bearing. (data type: float)
* N\_ball: Number of balls. (data type: int)
* D\_ball: Diameter of balls. (data type: float)
* D\_pitch: Pitch diameter. (data type: float)
* Alpha: Initial contact angle. (data type: float)

Function parameter:

* N: Range of peak detection. (data type: int)
* Order: The order of the fault frequency. (data type: int)
* Limit: Upper limit of the frequency range for peak detection. (data type: float)

**Functional description of the main components**

The overall view of the function of EMD is divided into "Data Upload", and "Parameter".

图形用户界面, 应用程序

描述已自动生成

### Data Upload

The user needs to upload the data file and the label file. The uploaded data files and label files support ".mat", ".txt", ".csv", ".xls", and ".npy" format files.

图形用户界面, 文本, 应用程序

描述已自动生成

### Parameter

The user can set the parameters here.

图片包含 图形用户界面

描述已自动生成

### Result

After the software has been run, click the "Download" button to download relevant result data.

图形用户界面, 文本, 应用程序, 聊天或短信

描述已自动生成

**Examples**

The process of using EMD in feature extraction.

**Step 1: Configuration procedure**

Select "Feature Extraction and Reduction" from the process bar on the left side of the web page.



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

图形用户界面, 文本, 应用程序, 聊天或短信

描述已自动生成

**Step 2: Data file upload**

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

图形用户界面, 文本, 应用程序

描述已自动生成

Click "Upload" after successfully selecting the upload data file, and then click "Save".

**Step 3: Select the function**

The ''EMD'' function is chosen for feature extraction.

图形用户界面, 文本, 应用程序, 电子邮件

描述已自动生成

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

**图形用户界面

中度可信度描述已自动生成**

Firstly, the user needs to select one fault type in "Fault Type". Then set the parameters in the blank box. For details about the parameters of the function, see "Parameter introduction".

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 file format.

**图形用户界面, 文本, 应用程序, 聊天或短信

描述已自动生成**

Finally, select "Run".

**Step 6: Download**

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

**图形用户界面, 文本

描述已自动生成**

Click "Download" to download the file of data.

