# The Function of Time Domain Feature Extraction

Feature extraction based on time domain feature extraction.

## Description

The function of time domain feature extraction returns the time domain features of the signal. "Data Upload" is used to load the required data set and label set, and the required features should be selected in the "Parameter" field.

## Parameter introduction

Parameters of time domain feature extraction:

* Max: The largest value in the data. (data type: float)
* Min: The smallest value in the data. (data type: float)
* Mean: The result of dividing a sum of numbers by their number. (data type: float)
* Root Mean Square: The square root of the mean square (the arithmetic mean of the squares) of the data set. (data type: float)
* Standard Deviation: The square root of its variance. (data type: float)
* Variance: The expectation of the squared deviation of a random variable from its sample mean. (data type: float)
* Median: The central value. (data type: float)
* Skewness: A measure of the asymmetry of the probability distribution of a real-valued random variable about its mean. It is defined as (mean-median) / standard deviation. (data type: float)
* Kurtosis: The deviation of the curve of a distribution from the curve of a normal distribution. (data type: float)
* Peak to Peak Value: The difference between the highest and the lowest values in a waveform. (data type: float)
* Crest Factor: The peak amplitude of the waveform divided by the RMS value of the waveform. The crest factor indicates how extreme the peaks are in a waveform. (data type: float)
* Shape Factor: The ratio of the RMS value to the mean value of the signal. (data type: float)
* Impulse Factor: The ratio of peak value to mean value of the signal. (data type: float)

**Functional description of the main components**

The overall view of the function of time domain feature extraction is divided into "Data Upload", and "Parameter".

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### Data Upload

In the "Time Domain Feature Extraction", the user only needs to upload the data file. The uploaded data files support ".mat", ".txt", ".csv", ".xls", and ".npy" format files.

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### Parameter

The user can select the required features here.

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### Result

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

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**Examples**

The process of using time domain feature extraction in feature extraction.

**Step 1: Configure the 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.

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**Step 2: Upload the data file and the label file**

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

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

**Step 3: Select the function**

The ''Time Domain Feature Extraction'' function is chosen for feature extraction.

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

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Firstly, the user needs to select features.

If the user clicks the "Select All" button, all time domain features will be selected. Then if the user clicks the "Deselect All" button, all selected features are canceled.

Finally, click "Save" after the required features are selected.

**Step 5: Execute the configured procedure**

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

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Finally, select "Run".

**Step 6: Download**

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

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Click "Download" to download the file of data.

