# The Function of Monte Carlo Sampling

Data augmentation based on Monte Carlo sampling.

## Description

The function of Monte Carlo sampling returns the signals after augmentation. "File Upload" is used to load the required data set, and the required parameters should be set in the "Parameter" field.

## Parameter introduction

Parameters of Monte Carlo sampling:

Function parameter:

* Mode: Two modes: Data fitting and Monte Carlo sampling of fitted parameters, Monte Carlo sampling of input parameter.
* Distribution: Different types of distributions: Weibull distribution, normal distribution, and gamma distribution.
* Function select: The form of the function.
* Num: The number of the increased data set. (data type: int)
* Parameter a, b, c, d, e: Value of parameters. (data type: float)

**Functional description of the main components**

The overall view of the function of Monte Carlo sampling is divided into "File Upload", "Parameter" and "Result".

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### File Upload

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



### Parameter

The user can set the parameters here.

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### Result

After the software has been run, click the "Show Result" button to display one diagram: Degradation trajectories after Monte Carlo sampling.

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The "Download" button downloads relevant data and three diagrams: Degradation trajectories after Monte Carlo sampling, original degradation trajectories, and degradation trajectories after fitting.

图表, 直方图

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**Examples**

The process of using Monte Carlo sampling in data augmentation.

**Step 1: Configure the procedure**

Select "Data Augmentation & Sample Generation" 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: Select the function**

The ''Monte Carlo Sampling'' function is chosen for data augmentation.

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**Step 3: Upload the data file**

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



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

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

Firstly, the user needs to select one mode in "Mode", one distribution method in "Distribution" and one function in "Function select". 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.

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**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: Show the result**

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

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Select "Show Result" to simply view the original degradation trajectories, and the remaining images can be downloaded and viewed.

图表, 直方图

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**Step 7: Download**

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

