i4Q Data Integration and Transformation Services Solution

User Manual

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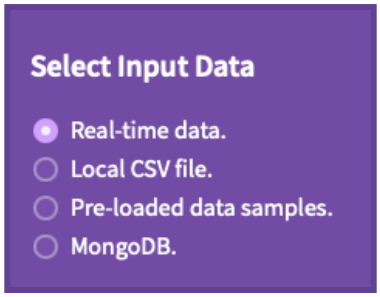
1. User Interface

The above picture showcases the i4Q^{DIT} solution interface as presented to the user, after accessing the available demo via the following URL: http://160.40.53.97:8506

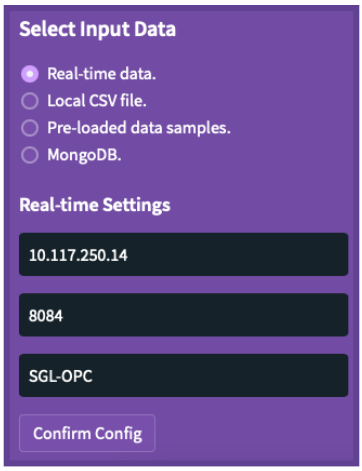
2. Input data

In the sidebar, located on the left side of the tool's UI, the user can initially select the different ways to import data.

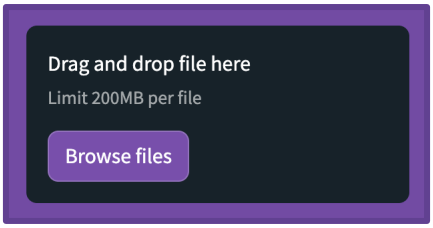


The user can upload data in the i4Q[DIT] by selecting from a set of data input options.
These options include:

- **Real-time data:** This option allows the user to connect to a machine and draw data directly from the sensors. The connection is established through a Kafka message broker. To receive real-time, the user needs to specify the IP address and the id of the machine, and then press "confirm config" to initiate the process.

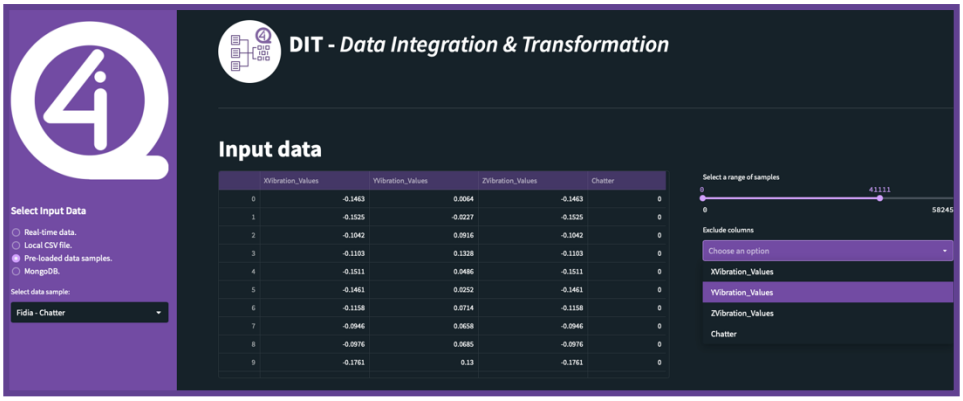


- **Local CSV files:** This option allows the user to upload a dataset in a CSV file format.

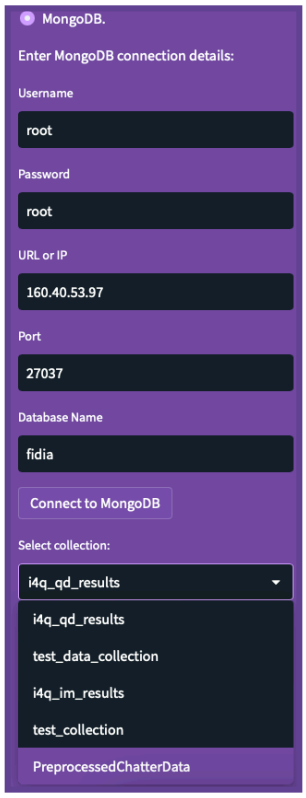


The user can either drag and drop a file in the section dark frame as shown in the above picture or by pressing the **"Browse files"** button to search and select a file in their local directories.

- **Pre-loaded data samples:** This option allows the user to import a pre-loaded data sample. The selection of datasets is done through a dropdown menu on the left of the User Interface (UI), while on the right side of the screen, the input data can be visualized and the user can select the range of samples to import, as well as which variables to exclude.



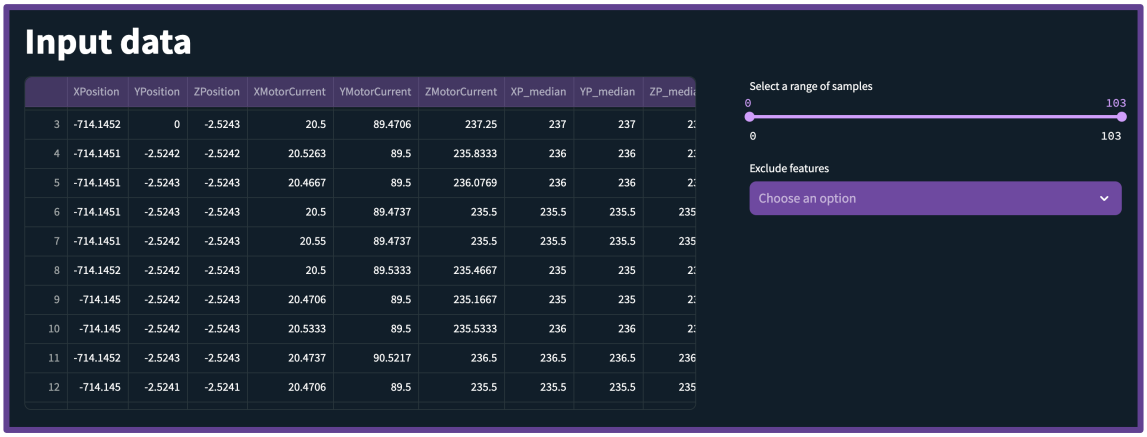
- **MongoDB:** This option allows the user to import data from the Mongo database provided by the **i4Q**DR Solution or by any other Mongo installation. To connect to a MongoDB installation the user is prompted to enter his/her credentials, the IP & port of the MongoDB server as well as declare the database that he/her wants to access. Then the **"Connect"** button should be pressed to complete the connection.



Once the connection is established the user needs to select, from a dropdown menu, the desired collection from which the data are going to be received and specify the range of the samples that will be received using the double action slider. Finally, by pressing the **"Receive data"** button the data uploading operation will be completed.

2.2 Input data

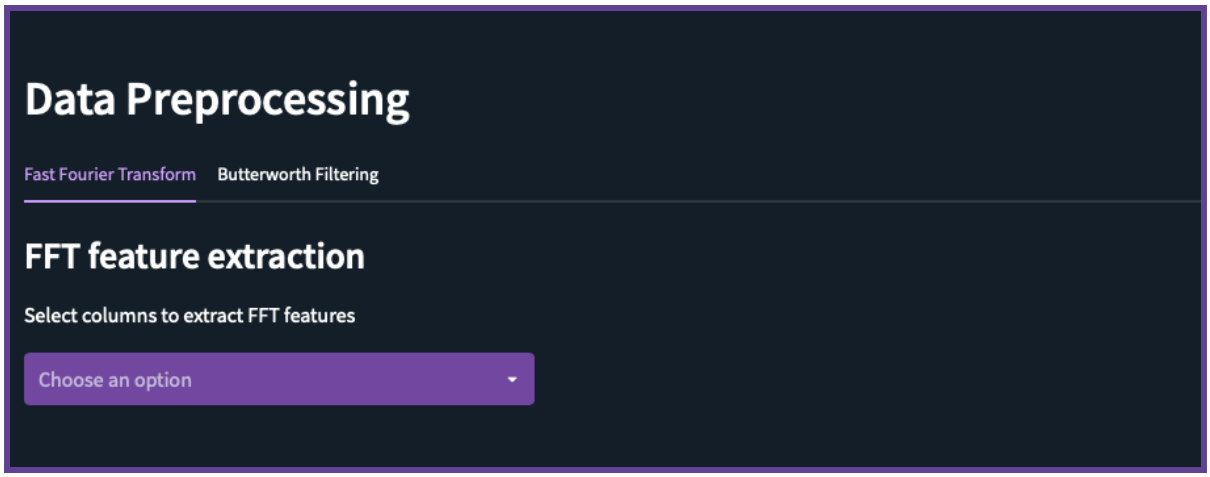
Once the user has uploaded some data samples into the i4Q^{DIT} solution, a table containing the data itself will be presented in the main UI board of the tool, as seen below.



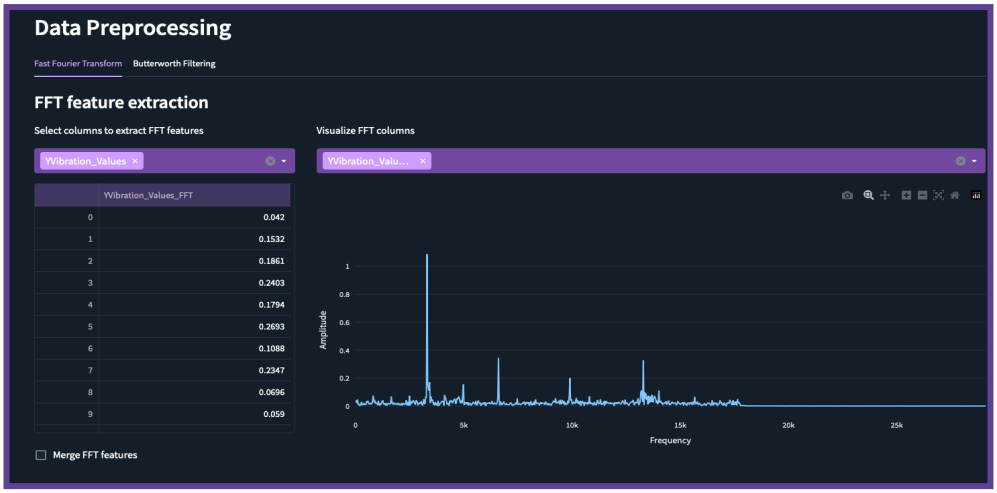
The number of samples that should be kept for the sub-sequent analysis can be determined, by adjusting the range of data samples through the available range slider. Also, a dropdown menu is provided, that allows the user to exclude any column/feature from the dataset.

2.3 Data preprocessing

Bellow the **"Input data"** section there is the **"Data preprocessing section"**, in which the user can apply different preprocessing functions to the data. In particular, the user can apply Fast Fourier Transformation and Butterworth Filtering on selected columns.



The extracted features can be visualized and merged with the initial data.



2.4 Data provision and storage

In this section the user can visualize the final data and save them as a new dataset. Afterwards there are the following options: a) to download the data as a CSV file, b) to store the data in the MongoDB in the i4QDR solution or c) to send the data to another Kafka topic through the message broker.