**Manual Datasheet**

The main folder includes three python files, raw dataset file “\*.pkl” that include the processed data in sim-data folder, and pretrained dataset “.h5”.

Sim-data: folder that includes all excel files for data.

The three python files are:

**Main2.py**: It is the main file that also handles the GUI components.

**read\_data4.py**: Concerned with data reading, cleaning, and processing.

**model\_training\_keras3.py**: Deals with model training using Karas.

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**Buttons and Cells**

* **Load old Dataset**: It loads \*.pkl files that were generated previously as processed and cleaned data of the excel files.

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  Description automatically generatedWe can update this dataset by one of the two options, with organizing, preprocessing, and cleaning:

1. **Update with excel file**: It opens a window to select the only required excel file.
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   Description automatically generatedUpdate with folder**: It opens a window to select the required folder that contains many excel files. It organizes these files and selects the data and annotates them by their irradiance and temperature.

* **Save New Dataset:** After updating the dataset, we can save it using this push button.
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  Description automatically generatedTrain Dataset**: It is used to train dataset with linear regression approach with Adam optimizer. We can tune the parameters as we prefer. It will also save the trained dataset with “\*.h5” format with the date and time.

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* **Load Trained Dataset:** It is used to load the pre-train dataset if exists to be used only “\*.h5” files.
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  Description automatically generatedIrradiance & Temperature Cells:**  These two cells are used as tested inputs to predict the output based on the pretrained “\*.h5” dataset.
* **A screenshot of a computer

  Description automatically generatedTest Trained Dataset:** It is used to test the pre-train dataset (For guarantee, it should direct you to select the pretrained dataset).
* **MPP cell:**  This cell is an output cell to present the result of MPPT based on tested inputs and the pretrained “\*.h5” dataset.

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  Description automatically generatedClose GUI:** It is used to stop the code and close GUI.

The outputs for this code are mainly:

**“\*.pkl”:** Dataset of organized, cleaned and processed data with the class structure with data of

1.1 Irradiance: List to store irradiance values.

1.2 Temperature: List to store temperature values.

1.3 MPP: List to store Maximum Power Point (MPP) values.

1.4 Voltage: List to store voltage readings.

1.5 Current: List to store current readings.

* 1. Power: List to store Power Values.

**“\*.h5”:** pretrained model for the input dataset with inputs as irradiance, temperature and outputs as MPPT.

**Note:** I have another version that the output includes the coefficients of the equation between voltage and current.

**Simulink Part**

For the Simulink part, the model looks as followed:

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**The three inputs are:**

1. **Pretrained Dataset Name**
2. **Irradiance Value**
3. **Temperature Value.**