## Changes made to Deep PMSM code and output

## Reference websites

1. <u>GitHub - upb-lea/deep-pmsm: Estimate intrinsic Permanent Magnet Synchronous Motor</u> temperatures with deep recurrent and convolutional neural networks.

Following version of PY libraries are being used:

	Library name	Version used
1	Tensor flow	2.15.0
2	Transformers	4.32.1
3	Numpy	1.24.3

Following changes were made to following files:

- 1. While trying to run hot\_cnn.py
  - a. Hot\_cnn.py:
    - i. The line "from tensorflow import set\_random\_seed" was replaced with "from tensorflow.random import set\_seed" due to changes in tensorflow.
    - ii. The function 'set random seed' was replaced with 'set seed'.
  - b. File utils.py:
    - i. The line "from tensorflow import set\_random\_seed" was replaced with "from tensorflow.random import set\_seed" due to changes in tensorflow.
    - ii. The function 'set random seed' was replaced with 'set seed'.
    - iii. This change is same as in file hot cnn.py
  - c. Custom layers.py:
    - i. The line "from keras.engine import InputSpec " was replaced with "import tensorflow.python.keras.engine as KE"
    - ii. Furthermore, the *InputSpec* function was used as *KE.InputSpec*
  - d. Cnn model utils.py:
    - i. The line 'from keras.engine import InputSpec 'was replaced with 'import tensorflow.python.keras.engine as KE'.
    - ii. Furthermore, the *InputSpec* function was used as *KE.InputSpec*
    - iii. This change is the same as performed in custom\_layers.py
    - iv. The line 'from keras.wrappers.scikit\_learn import KerasRegressor 'is replaced with 'from scikeras.wrappers import KerasRegressor'
- 2. Input file downloaded from kaggle website: file name: measures\_v2.csv renamed to measures.csv as expected by the program.

## 3. Following output and error observed in run-time

```
2023-12-21 17:56:16.302669: I tensorflow/core/util/port.cc:113] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders. To turn them off, set the environment variable `TF_ENABLE_ONEDNN_OPTS=0`.
WARNING:tensorflow:From C:\Users\Users\Lambda ANACONDA\Lib\site-packages\keras\src\losses.py:2976: The name tf.losses.sparse_softmax_cross_entropy is depr
 cated. Please use tf.compat.v1.losses.sparse_softmax_cross_entropy instead.
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Duild dataset ..

2023-12-21 17:56:51.198316: I tensorflow/core/util/port.cc:113] oneDNN custom operations are on. You may see slightly different numerical results due
to floating-point round-off errors from different computation orders. To turn them off, set the environment variable `TF_ENABLE_ONEDNN_OPTS=0`.
2023-12-21 17:56:51.494881: I tensorflow/core/util/port.cc:113] oneDNN custom operations are on. You may see slightly different numerical results due
to floating-point round-off errors from different computation orders. To turn them off, set the environment variable `TF_ENABLE_ONEDNN_OPTS=0`.

WARNING:tensorflow:From C:\Users\Nandita\ANACONDA\Lib\site-packages\keras\src\losses.py:2976: The name tf.losses.sparse_softmax_cross_entropy is depr
 cated. Please use tf.compat.v1.losses.sparse_softmax_cross_entropy instead.
WARNING:tensorflow:From C:\Users\- 3\ANACONDA\Lib\site-packages\keras\src\losses.py:2976: The name tf.losses.sparse_softmax_cross_entropy is depre-
ecated. Please use tf.compat.v1.losses.sparse_softmax_cross_entropy instead.
483.52693462371826 MB
 \deep-pmsm-master-new\deep-pmsm-master-new\pmsm\hot cnn.py", line 107, in <module>
                                                                            wy\deep-pmsm-master-new\deep-pmsm-master-new\pmsm\hot_cnn.py", line 86, in main
     result.history = mode1.fit(**fit_cfg)
     File "C:\Users
                                                                              y\deep-pmsm-master-new\deep-pmsm-master-new\pmsm\preprocessing\cnn_model_utils.py", line 209, in _ge
 seq = LoadprofileGenerator(samples, target,
     ry\deep-pmsm-master-new\deep-pmsm-master-new\pmsm\preprocessing\file_utils.py", line 52, in __init_
end_index=len(data[θ]), batch_size=batch_size)
```