

MLPRegressor_Seg_v3_stage_1

November 23, 2022

1 MLPRegressor

```
[ ]: import numpy as np
import pandas as pd

import matplotlib.pyplot as plt
import seaborn as sns

from sklearn.model_selection import train_test_split, RandomizedSearchCV
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import Pipeline
from sklearn.neural_network import MLPRegressor
from sklearn.feature_selection import SelectFromModel
from sklearn.metrics import r2_score, mean_absolute_percentage_error, \
    mean_absolute_error, mean_squared_error
from statsmodels.tools.eval_measures import stde

import kerastuner as kt
import tensorflow as tf
from tensorflow.keras import models
```

```
[ ]: from tensorflow.python.client import device_lib

print('Default GPU Device: {}'.format(tf.test.gpu_device_name()))
```

Default GPU Device:

1.1 Read the etl info results

```
[ ]: df_info = pd.read_csv('../dataset_clean/options_csv_v1_etl.csv')
df_info
```

```
[ ]: remove_time_features  generic_features  remove_atypical_values  \
0                        False                        False                        False

feature_combination  remove_feature_selection  \
0                  False                        False
```

```
remove_invalid_correlated_features
0 False
```

1.2 Read the dataset

```
[ ]: df = pd.read_csv('../dataset/V2_PlatteRiverWeir_features_merged_all.csv')
df
```

```
[ ]:      Unnamed: 0.1  Unnamed: 0      SensorTime      CaptureTime  \
0                0          0  2012-06-09 13:15:00  2012-06-09T13:09:07
1                1          1  2012-06-09 13:15:00  2012-06-09T13:10:29
2                2          2  2012-06-09 13:45:00  2012-06-09T13:44:01
3                3          3  2012-06-09 14:45:00  2012-06-09T14:44:30
4                4          4  2012-06-09 15:45:00  2012-06-09T15:44:59
...
42054          42054      42054  2019-10-11 09:00:00  2019-10-11T08:59:53
42055          42055      42055  2019-10-11 10:00:00  2019-10-11T09:59:52
42056          42056      42056  2019-10-11 11:00:00  2019-10-11T10:59:52
42057          42057      42057  2019-10-11 12:00:00  2019-10-11T11:59:53
42058          42058      42058  2019-10-11 12:45:00  2019-10-11T12:59:52
```

```
      Filename Agency  SiteNumber TimeZone  \
0  statelineweir_20120609_farrell_001.jpg  USGS      6674500      MDT
1  statelineweir_20120609_farrell_002.jpg  USGS      6674500      MDT
2  statelineweir_20120609_farrell_003.jpg  USGS      6674500      MDT
3  statelineweir_20120609_farrell_004.jpg  USGS      6674500      MDT
4  statelineweir_20120609_farrell_005.jpg  USGS      6674500      MDT
...
42054  statelineweir_20191011_farrell_409.jpg  USGS      6674500      MDT
42055  statelineweir_20191011_farrell_410.jpg  USGS      6674500      MDT
42056  statelineweir_20191011_farrell_411.jpg  USGS      6674500      MDT
42057  statelineweir_20191011_farrell_412.jpg  USGS      6674500      MDT
42058  statelineweir_20191011_farrell_413.jpg  USGS      6674500      MDT
```

```
      Stage  Discharge  ... WwRawLineMin  WwRawLineMax  WwRawLineMean  \
0      2.99      916.0  ...           0.0           0.0      0.000000
1      2.99      916.0  ...           0.0           0.0      0.000000
2      2.96      873.0  ...           0.0           0.0      0.000000
3      2.94      846.0  ...           0.0           0.0      0.000000
4      2.94      846.0  ...           0.0           0.0      0.000000
...
42054  2.54      434.0  ...      9284.0      77521.0  38385.370066
42055  2.54      434.0  ...     10092.0      74614.0  40162.989292
42056  2.54      434.0  ...      7067.0      83260.0  42095.946590
42057  2.54      434.0  ...      6283.0      83045.0  45345.490954
42058  2.54      434.0  ...      7375.0      89813.0  47877.870782
```

	WwRawLineSigma	WwCurveLineMin	WwCurveLineMax	WwCurveLineMean	\
0	0.000000	0.0	0.0	0.000000	
1	0.000000	0.0	0.0	0.000000	
2	0.000000	0.0	0.0	0.000000	
3	0.000000	0.0	0.0	0.000000	
4	0.000000	0.0	0.0	0.000000	
...	
42054	15952.029728	0.0	70085.0	37550.894823	
42055	15467.708856	0.0	70061.0	39397.339095	
42056	16770.357949	0.0	76335.0	41350.006568	
42057	17498.432849	0.0	78882.0	44553.920296	
42058	19963.166359	0.0	82630.0	47280.270559	

	WwCurveLineSigma	RiverArea	RiverWidth
0	0.000000	49975.0	207.508733
1	0.000000	50184.0	208.663145
2	0.000000	50543.0	209.445067
3	0.000000	50856.0	211.265690
4	0.000000	51004.0	211.250274
...
42054	16444.401209	45842.0	194.934605
42055	16009.008049	42300.0	194.762264
42056	17489.374617	41080.0	196.480105
42057	18268.294896	40976.0	193.595245
42058	20559.358767	41435.0	196.801994

[42059 rows x 63 columns]

```
[ ]: df['SensorTime'] = pd.to_datetime(df['SensorTime'])
df['Year'] = df['SensorTime'].dt.year
df['Month'] = df['SensorTime'].dt.month
df['date_offset'] = (df.SensorTime.dt.month * 100 + df.SensorTime.dt.day - 1) % 320
df['Season'] = pd.cut(df['date_offset'], [0, 300, 602, 900, 1300],
                      labels=['spring', 'summer', 'autumn', 'winter'])
```

```
[ ]: df = df[["CaptureTime", "SensorTime", "Stage", "Discharge", "RiverArea", "RiverWidth", "Month", "Season", "Year"]]
df
```

	CaptureTime	SensorTime	Stage	Discharge	RiverArea	\
0	2012-06-09T13:09:07	2012-06-09 13:15:00	2.99	916.0	49975.0	
1	2012-06-09T13:10:29	2012-06-09 13:15:00	2.99	916.0	50184.0	
2	2012-06-09T13:44:01	2012-06-09 13:45:00	2.96	873.0	50543.0	
3	2012-06-09T14:44:30	2012-06-09 14:45:00	2.94	846.0	50856.0	

```

4      2012-06-09T15:44:59 2012-06-09 15:45:00 2.94      846.0      51004.0
...
42054  2019-10-11T08:59:53 2019-10-11 09:00:00 2.54      434.0      45842.0
42055  2019-10-11T09:59:52 2019-10-11 10:00:00 2.54      434.0      42300.0
42056  2019-10-11T10:59:52 2019-10-11 11:00:00 2.54      434.0      41080.0
42057  2019-10-11T11:59:53 2019-10-11 12:00:00 2.54      434.0      40976.0
42058  2019-10-11T12:59:52 2019-10-11 12:45:00 2.54      434.0      41435.0

```

```

      RiverWidth  Month  Season  Year
0      207.508733      6  spring 2012
1      208.663145      6  spring 2012
2      209.445067      6  spring 2012
3      211.265690      6  spring 2012
4      211.250274      6  spring 2012
...
42054  194.934605     10  autumn 2019
42055  194.762264     10  autumn 2019
42056  196.480105     10  autumn 2019
42057  193.595245     10  autumn 2019
42058  196.801994     10  autumn 2019

```

[42059 rows x 9 columns]

```
[ ]: df.dtypes
```

```

[ ]: CaptureTime      object
SensorTime      datetime64[ns]
Stage      float64
Discharge      float64
RiverArea      float64
RiverWidth      float64
Month      int64
Season      category
Year      int64
dtype: object

```

1.2.1 Remove outliers

```

[ ]: df = df[df.Stage > 0]
df = df[df.Discharge > 0]
df.shape

```

```
[ ]: (40148, 9)
```

```

[ ]: df = df[df.RiverWidth > 0]
#df = df[df.Discharge > 0]
df.shape

```

```
[ ]: (40142, 9)
```

1.2.2 Remove winter

```
[ ]: #df = df[df.Season != "winter"]
```

```
[ ]: df.isna().sum()
```

```
[ ]: CaptureTime      0
      SensorTime      0
      Stage           0
      Discharge       0
      RiverArea       0
      RiverWidth      0
      Month           0
      Season          126
      Year            0
      dtype: int64
```

1.3 Divide dataset to X and Y

```
[ ]: np.random.seed(0)

      df_train = df[(df.Year >= 2012) & (df.Year <= 2016)]
      df_train = df_train.iloc[np.random.permutation(len(df_train))]

      df_val = df[(df.Year >= 2017) & (df.Year <= 2017)]
      df_val = df_val.iloc[np.random.permutation(len(df_val))]

      df_test = df[(df.Year >= 2018) & (df.Year <= 2019)]
```

```
[ ]: df_train = df_train.drop(columns=["Year", "SensorTime", "CaptureTime"])
      df_val = df_val.drop(columns=["Year", "SensorTime", "CaptureTime"])
      df_test = df_test.drop(columns=["Year", "SensorTime", "CaptureTime"])
```

```
[ ]: y_train = df_train[["Stage"]].values
      X_train = df_train[["RiverWidth", "Month"]].values

      y_val = df_train[["Stage"]].values
      X_val = df_train[["RiverWidth", "Month"]].values

      y_test = df_test[["Stage"]].values
      X_test = df_test[["RiverWidth", "Month"]].values
```

```
[ ]: print(X_train.shape)
      print(y_train.shape)
```

```
(20304, 2)
(20304, 1)
```

```
[ ]: input_shape = X_train.shape[1]
      output_shape = y_train.shape[1]

      print(input_shape, output_shape)
```

```
2 1
```

1.4 Train model

```
[ ]: def model_builder(lr):
      model = tf.keras.Sequential()
      model.add(tf.keras.Input(shape=input_shape))

      # Tune the number of units in the first Dense layer
      # Choose an optimal value between 32-512

      model.add(tf.keras.layers.Dense(32, activation="relu"))
      model.add(tf.keras.layers.Dense(64, activation="relu"))
      model.add(tf.keras.layers.Dense(128, activation="relu"))
      model.add(tf.keras.layers.Dense(64, activation="relu"))
      """model.add(tf.keras.layers.Dense(256, activation="tanh"))
      model.add(tf.keras.layers.Dense(512, activation="tanh"))
      model.add(tf.keras.layers.Dense(512, activation="tanh"))
      model.add(tf.keras.layers.Dense(256, activation="tanh"))
      model.add(tf.keras.layers.Dense(256, activation="tanh"))
      model.add(tf.keras.layers.Dense(128, activation="tanh"))
      model.add(tf.keras.layers.Dense(64, activation="tanh"))
      model.add(tf.keras.layers.Dense(32, activation="tanh"))"""

      model.add(tf.keras.layers.Dense(output_shape, activation = 'linear'))

      model.compile(optimizer = tf.keras.optimizers.Adam(learning_rate = lr), loss_
      ↪= 'mae', metrics = ['mse', tf.keras.metrics.
      ↪RootMeanSquaredError(name='rmse'), 'mae', 'mape'])

      return model
```

```
[ ]: model = model_builder(1e-3)
```

```
[ ]: import datetime

      date_actual = datetime.datetime.now().strftime("%Y%m%d-%H%M%S")
```

```

log_dir = "logs/fit/" + date_actual
tensorboard_callback = tf.keras.callbacks.TensorBoard(log_dir=log_dir,
↳histogram_freq=1)

es_callback = tf.keras.callbacks.EarlyStopping(monitor='val_loss', mode='min',
↳verbose=1, patience=100)

checkpoint_callback = tf.keras.callbacks.
↳ModelCheckpoint(filepath=f"model_weights/{date_actual}_mlp_best_weights.
↳hdf5",

                                monitor='val_loss',
                                verbose=1,
                                save_best_only=True)

```

```

[ ]: model.fit(X_train, y_train, epochs = 2000, batch_size = 64, validation_data =
↳(X_val, y_val), callbacks=[checkpoint_callback, es_callback, tf.keras.
↳callbacks.ReduceLROnPlateau(patience=40)])

```

Epoch 1/2000

296/318 [=====>...] - ETA: 0s - loss: 0.9355 - mse: 1.8455
- rmse: 1.3585 - mae: 0.9355 - mape: 31.7379

Epoch 1: val_loss improved from inf to 0.67933, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 1s 2ms/step - loss: 0.9203 - mse:
1.7892 - rmse: 1.3376 - mae: 0.9203 - mape: 31.1113 - val_loss: 0.6793 -
val_mse: 0.7825 - val_rmse: 0.8846 - val_mae: 0.6793 - val_mape: 23.8905 - lr:
0.0010

Epoch 2/2000

294/318 [=====>...] - ETA: 0s - loss: 0.7348 - mse: 1.0381
- rmse: 1.0189 - mae: 0.7348 - mape: 23.8783

Epoch 2: val_loss did not improve from 0.67933

318/318 [=====] - 0s 1ms/step - loss: 0.7301 - mse:
1.0282 - rmse: 1.0140 - mae: 0.7301 - mape: 23.6984 - val_loss: 0.6893 -
val_mse: 0.7934 - val_rmse: 0.8907 - val_mae: 0.6893 - val_mape: 24.6079 - lr:
0.0010

Epoch 3/2000

284/318 [=====>...] - ETA: 0s - loss: 0.7220 - mse: 1.0010
- rmse: 1.0005 - mae: 0.7220 - mape: 23.3378

Epoch 3: val_loss improved from 0.67933 to 0.64661, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 0s 2ms/step - loss: 0.7209 - mse:
0.9971 - rmse: 0.9986 - mae: 0.7209 - mape: 23.3442 - val_loss: 0.6466 -
val_mse: 0.7789 - val_rmse: 0.8826 - val_mae: 0.6466 - val_mape: 21.1963 - lr:
0.0010

Epoch 4/2000

279/318 [=====>...] - ETA: 0s - loss: 0.6368 - mse: 0.8672
- rmse: 0.9313 - mae: 0.6368 - mape: 19.6581

Epoch 4: val_loss improved from 0.64661 to 0.60459, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.6375 - mse:
0.8667 - rmse: 0.9310 - mae: 0.6375 - mape: 19.6721 - val_loss: 0.6046 -
val_mse: 0.8767 - val_rmse: 0.9363 - val_mae: 0.6046 - val_mape: 17.6092 - lr:
0.0010
Epoch 5/2000
272/318 [=====>...] - ETA: 0s - loss: 0.5812 - mse: 0.7811
- rmse: 0.8838 - mae: 0.5812 - mape: 17.8541
Epoch 5: val_loss improved from 0.60459 to 0.59620, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.5723 - mse:
0.7651 - rmse: 0.8747 - mae: 0.5723 - mape: 17.6313 - val_loss: 0.5962 -
val_mse: 0.6852 - val_rmse: 0.8278 - val_mae: 0.5962 - val_mape: 19.8224 - lr:
0.0010
Epoch 6/2000
293/318 [=====>...] - ETA: 0s - loss: 0.5109 - mse: 0.6682
- rmse: 0.8174 - mae: 0.5109 - mape: 15.9812
Epoch 6: val_loss improved from 0.59620 to 0.51496, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.5099 - mse:
0.6694 - rmse: 0.8182 - mae: 0.5099 - mape: 15.9313 - val_loss: 0.5150 -
val_mse: 0.7338 - val_rmse: 0.8566 - val_mae: 0.5150 - val_mape: 15.1182 - lr:
0.0010
Epoch 7/2000
274/318 [=====>...] - ETA: 0s - loss: 0.4938 - mse: 0.6491
- rmse: 0.8057 - mae: 0.4938 - mape: 15.4061
Epoch 7: val_loss improved from 0.51496 to 0.45020, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.4884 - mse:
0.6430 - rmse: 0.8019 - mae: 0.4884 - mape: 15.1900 - val_loss: 0.4502 -
val_mse: 0.6057 - val_rmse: 0.7783 - val_mae: 0.4502 - val_mape: 13.6133 - lr:
0.0010
Epoch 8/2000
318/318 [=====] - ETA: 0s - loss: 0.4650 - mse: 0.6317
- rmse: 0.7948 - mae: 0.4650 - mape: 14.1542
Epoch 8: val_loss improved from 0.45020 to 0.42974, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.4650 - mse:
0.6317 - rmse: 0.7948 - mae: 0.4650 - mape: 14.1542 - val_loss: 0.4297 -
val_mse: 0.5869 - val_rmse: 0.7661 - val_mae: 0.4297 - val_mape: 12.8660 - lr:
0.0010
Epoch 9/2000
315/318 [=====>.] - ETA: 0s - loss: 0.4483 - mse: 0.6055
- rmse: 0.7781 - mae: 0.4483 - mape: 13.5897
Epoch 9: val_loss did not improve from 0.42974
318/318 [=====] - 0s 2ms/step - loss: 0.4481 - mse:
0.6054 - rmse: 0.7781 - mae: 0.4481 - mape: 13.5796 - val_loss: 0.4462 -


```

val_mse: 0.7121 - val_rmse: 0.8439 - val_mae: 0.4462 - val_mape: 12.5547 - lr:
0.0010
Epoch 10/2000
273/318 [=====>...] - ETA: 0s - loss: 0.4518 - mse: 0.6057
- rmse: 0.7783 - mae: 0.4518 - mape: 13.7582
Epoch 10: val_loss did not improve from 0.42974
318/318 [=====] - 0s 1ms/step - loss: 0.4503 - mse:
0.6044 - rmse: 0.7774 - mae: 0.4503 - mape: 13.7093 - val_loss: 0.5079 -
val_mse: 0.7714 - val_rmse: 0.8783 - val_mae: 0.5079 - val_mape: 14.3428 - lr:
0.0010
Epoch 11/2000
285/318 [=====>...] - ETA: 0s - loss: 0.4373 - mse: 0.6073
- rmse: 0.7793 - mae: 0.4373 - mape: 13.1044
Epoch 11: val_loss improved from 0.42974 to 0.41707, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.4359 - mse:
0.6037 - rmse: 0.7770 - mae: 0.4359 - mape: 13.0354 - val_loss: 0.4171 -
val_mse: 0.5486 - val_rmse: 0.7407 - val_mae: 0.4171 - val_mape: 12.6307 - lr:
0.0010
Epoch 12/2000
316/318 [=====>.] - ETA: 0s - loss: 0.4291 - mse: 0.5853
- rmse: 0.7651 - mae: 0.4291 - mape: 12.8828
Epoch 12: val_loss did not improve from 0.41707
318/318 [=====] - 0s 2ms/step - loss: 0.4292 - mse:
0.5850 - rmse: 0.7648 - mae: 0.4292 - mape: 12.8908 - val_loss: 0.4772 -
val_mse: 0.5154 - val_rmse: 0.7179 - val_mae: 0.4772 - val_mape: 16.2468 - lr:
0.0010
Epoch 13/2000
277/318 [=====>...] - ETA: 0s - loss: 0.4262 - mse: 0.5810
- rmse: 0.7622 - mae: 0.4262 - mape: 12.8217
Epoch 13: val_loss did not improve from 0.41707
318/318 [=====] - 0s 1ms/step - loss: 0.4268 - mse:
0.5796 - rmse: 0.7613 - mae: 0.4268 - mape: 12.8856 - val_loss: 0.4406 -
val_mse: 0.5694 - val_rmse: 0.7546 - val_mae: 0.4406 - val_mape: 13.5248 - lr:
0.0010
Epoch 14/2000
294/318 [=====>...] - ETA: 0s - loss: 0.4273 - mse: 0.5815
- rmse: 0.7626 - mae: 0.4273 - mape: 12.8906
Epoch 14: val_loss improved from 0.41707 to 0.41490, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.4263 - mse:
0.5794 - rmse: 0.7612 - mae: 0.4263 - mape: 12.8582 - val_loss: 0.4149 -
val_mse: 0.6048 - val_rmse: 0.7777 - val_mae: 0.4149 - val_mape: 12.0971 - lr:
0.0010
Epoch 15/2000
293/318 [=====>...] - ETA: 0s - loss: 0.4164 - mse: 0.5646
- rmse: 0.7514 - mae: 0.4164 - mape: 12.5702
Epoch 15: val_loss did not improve from 0.41490

```

318/318 [=====] - 0s 1ms/step - loss: 0.4194 - mse: 0.5707 - rmse: 0.7554 - mae: 0.4194 - mape: 12.6491 - val_loss: 0.4496 - val_mse: 0.5010 - val_rmse: 0.7078 - val_mae: 0.4496 - val_mape: 15.0352 - lr: 0.0010

Epoch 16/2000

295/318 [=====>...] - ETA: 0s - loss: 0.4171 - mse: 0.5600 - rmse: 0.7483 - mae: 0.4171 - mape: 12.6245

Epoch 16: val_loss improved from 0.41490 to 0.39849, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 0s 1ms/step - loss: 0.4167 - mse: 0.5581 - rmse: 0.7471 - mae: 0.4167 - mape: 12.6318 - val_loss: 0.3985 - val_mse: 0.5703 - val_rmse: 0.7552 - val_mae: 0.3985 - val_mape: 11.6439 - lr: 0.0010

Epoch 17/2000

285/318 [=====>...] - ETA: 0s - loss: 0.4144 - mse: 0.5657 - rmse: 0.7521 - mae: 0.4144 - mape: 12.4692

Epoch 17: val_loss did not improve from 0.39849

318/318 [=====] - 0s 1ms/step - loss: 0.4127 - mse: 0.5615 - rmse: 0.7493 - mae: 0.4127 - mape: 12.4197 - val_loss: 0.4257 - val_mse: 0.6115 - val_rmse: 0.7820 - val_mae: 0.4257 - val_mape: 12.4161 - lr: 0.0010

Epoch 18/2000

296/318 [=====>...] - ETA: 0s - loss: 0.4161 - mse: 0.5634 - rmse: 0.7506 - mae: 0.4161 - mape: 12.5800

Epoch 18: val_loss improved from 0.39849 to 0.39295, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 0s 1ms/step - loss: 0.4165 - mse: 0.5637 - rmse: 0.7508 - mae: 0.4165 - mape: 12.6063 - val_loss: 0.3929 - val_mse: 0.5192 - val_rmse: 0.7205 - val_mae: 0.3929 - val_mape: 11.8826 - lr: 0.0010

Epoch 19/2000

297/318 [=====>..] - ETA: 0s - loss: 0.4063 - mse: 0.5558 - rmse: 0.7455 - mae: 0.4063 - mape: 12.1770

Epoch 19: val_loss did not improve from 0.39295

318/318 [=====] - 0s 1ms/step - loss: 0.4078 - mse: 0.5566 - rmse: 0.7461 - mae: 0.4078 - mape: 12.2206 - val_loss: 0.4005 - val_mse: 0.4983 - val_rmse: 0.7059 - val_mae: 0.4005 - val_mape: 12.3752 - lr: 0.0010

Epoch 20/2000

295/318 [=====>...] - ETA: 0s - loss: 0.4020 - mse: 0.5425 - rmse: 0.7366 - mae: 0.4020 - mape: 12.1161

Epoch 20: val_loss did not improve from 0.39295

318/318 [=====] - 0s 1ms/step - loss: 0.4034 - mse: 0.5469 - rmse: 0.7395 - mae: 0.4034 - mape: 12.1078 - val_loss: 0.4035 - val_mse: 0.4978 - val_rmse: 0.7055 - val_mae: 0.4035 - val_mape: 12.6487 - lr: 0.0010

Epoch 21/2000

282/318 [=====>...] - ETA: 0s - loss: 0.4095 - mse: 0.5435

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- rmse: 0.7373 - mae: 0.4095 - mape: 12.3798
Epoch 21: val_loss did not improve from 0.39295
318/318 [=====] - 0s 1ms/step - loss: 0.4089 - mse:
0.5434 - rmse: 0.7371 - mae: 0.4089 - mape: 12.3979 - val_loss: 0.3966 -
val_mse: 0.5713 - val_rmse: 0.7559 - val_mae: 0.3966 - val_mape: 11.6285 - lr:
0.0010
Epoch 22/2000
288/318 [=====>...] - ETA: 0s - loss: 0.4199 - mse: 0.5862
- rmse: 0.7656 - mae: 0.4199 - mape: 12.5972
Epoch 22: val_loss did not improve from 0.39295
318/318 [=====] - 0s 1ms/step - loss: 0.4183 - mse:
0.5794 - rmse: 0.7612 - mae: 0.4183 - mape: 12.5877 - val_loss: 0.4463 -
val_mse: 0.5553 - val_rmse: 0.7452 - val_mae: 0.4463 - val_mape: 13.6456 - lr:
0.0010
Epoch 23/2000
295/318 [=====>...] - ETA: 0s - loss: 0.4016 - mse: 0.5457
- rmse: 0.7387 - mae: 0.4016 - mape: 12.0347
Epoch 23: val_loss did not improve from 0.39295
318/318 [=====] - 0s 1ms/step - loss: 0.4025 - mse:
0.5474 - rmse: 0.7398 - mae: 0.4025 - mape: 12.0654 - val_loss: 0.4185 -
val_mse: 0.5835 - val_rmse: 0.7639 - val_mae: 0.4185 - val_mape: 12.6409 - lr:
0.0010
Epoch 24/2000
296/318 [=====>...] - ETA: 0s - loss: 0.3930 - mse: 0.5158
- rmse: 0.7182 - mae: 0.3930 - mape: 11.9117
Epoch 24: val_loss improved from 0.39295 to 0.39017, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.3920 - mse:
0.5132 - rmse: 0.7164 - mae: 0.3920 - mape: 11.9038 - val_loss: 0.3902 -
val_mse: 0.4741 - val_rmse: 0.6885 - val_mae: 0.3902 - val_mape: 12.1553 - lr:
0.0010
Epoch 25/2000
313/318 [=====>.] - ETA: 0s - loss: 0.3953 - mse: 0.5217
- rmse: 0.7223 - mae: 0.3953 - mape: 12.0080
Epoch 25: val_loss did not improve from 0.39017
318/318 [=====] - 0s 2ms/step - loss: 0.3954 - mse:
0.5225 - rmse: 0.7228 - mae: 0.3954 - mape: 12.0021 - val_loss: 0.4336 -
val_mse: 0.6269 - val_rmse: 0.7918 - val_mae: 0.4336 - val_mape: 12.8466 - lr:
0.0010
Epoch 26/2000
274/318 [=====>...] - ETA: 0s - loss: 0.4037 - mse: 0.5433
- rmse: 0.7371 - mae: 0.4037 - mape: 12.1365
Epoch 26: val_loss did not improve from 0.39017
318/318 [=====] - 0s 1ms/step - loss: 0.4028 - mse:
0.5436 - rmse: 0.7373 - mae: 0.4028 - mape: 12.1264 - val_loss: 0.4612 -
val_mse: 0.7441 - val_rmse: 0.8626 - val_mae: 0.4612 - val_mape: 13.2072 - lr:
0.0010
Epoch 27/2000

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280/318 [=====>...] - ETA: 0s - loss: 0.4043 - mse: 0.5367
- rmse: 0.7326 - mae: 0.4043 - mape: 12.2673
Epoch 27: val_loss did not improve from 0.39017
318/318 [=====] - 0s 1ms/step - loss: 0.4075 - mse:
0.5445 - rmse: 0.7379 - mae: 0.4075 - mape: 12.3444 - val_loss: 0.4189 -
val_mse: 0.6240 - val_rmse: 0.7899 - val_mae: 0.4189 - val_mape: 12.2872 - lr:
0.0010
Epoch 28/2000
269/318 [=====>...] - ETA: 0s - loss: 0.3890 - mse: 0.5053
- rmse: 0.7108 - mae: 0.3890 - mape: 11.8824
Epoch 28: val_loss improved from 0.39017 to 0.38269, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.3860 - mse:
0.4960 - rmse: 0.7043 - mae: 0.3860 - mape: 11.8130 - val_loss: 0.3827 -
val_mse: 0.5200 - val_rmse: 0.7211 - val_mae: 0.3827 - val_mape: 11.3926 - lr:
0.0010
Epoch 29/2000
271/318 [=====>...] - ETA: 0s - loss: 0.3969 - mse: 0.5230
- rmse: 0.7232 - mae: 0.3969 - mape: 12.1024
Epoch 29: val_loss did not improve from 0.38269
318/318 [=====] - 0s 1ms/step - loss: 0.3951 - mse:
0.5163 - rmse: 0.7185 - mae: 0.3951 - mape: 12.0783 - val_loss: 0.3915 -
val_mse: 0.4990 - val_rmse: 0.7064 - val_mae: 0.3915 - val_mape: 11.8105 - lr:
0.0010
Epoch 30/2000
315/318 [=====>.] - ETA: 0s - loss: 0.3869 - mse: 0.5028
- rmse: 0.7091 - mae: 0.3869 - mape: 11.8209
Epoch 30: val_loss did not improve from 0.38269
318/318 [=====] - 0s 2ms/step - loss: 0.3869 - mse:
0.5034 - rmse: 0.7095 - mae: 0.3869 - mape: 11.8196 - val_loss: 0.4310 -
val_mse: 0.7168 - val_rmse: 0.8466 - val_mae: 0.4310 - val_mape: 11.9200 - lr:
0.0010
Epoch 31/2000
273/318 [=====>...] - ETA: 0s - loss: 0.3858 - mse: 0.4906
- rmse: 0.7005 - mae: 0.3858 - mape: 11.8666
Epoch 31: val_loss did not improve from 0.38269
318/318 [=====] - 0s 1ms/step - loss: 0.3880 - mse:
0.4934 - rmse: 0.7024 - mae: 0.3880 - mape: 11.9222 - val_loss: 0.4537 -
val_mse: 0.7203 - val_rmse: 0.8487 - val_mae: 0.4537 - val_mape: 13.3532 - lr:
0.0010
Epoch 32/2000
268/318 [=====>...] - ETA: 0s - loss: 0.3812 - mse: 0.4828
- rmse: 0.6948 - mae: 0.3812 - mape: 11.7502
Epoch 32: val_loss did not improve from 0.38269
318/318 [=====] - 0s 1ms/step - loss: 0.3814 - mse:
0.4788 - rmse: 0.6919 - mae: 0.3814 - mape: 11.7752 - val_loss: 0.4090 -
val_mse: 0.4353 - val_rmse: 0.6598 - val_mae: 0.4090 - val_mape: 13.5530 - lr:
0.0010

Epoch 33/2000
270/318 [=====>...] - ETA: 0s - loss: 0.3763 - mse: 0.4658
- rmse: 0.6825 - mae: 0.3763 - mape: 11.6580
Epoch 33: val_loss improved from 0.38269 to 0.37046, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.3774 - mse:
0.4708 - rmse: 0.6862 - mae: 0.3774 - mape: 11.6565 - val_loss: 0.3705 -
val_mse: 0.4600 - val_rmse: 0.6783 - val_mae: 0.3705 - val_mape: 11.3585 - lr:
0.0010
Epoch 34/2000
271/318 [=====>...] - ETA: 0s - loss: 0.3831 - mse: 0.5006
- rmse: 0.7075 - mae: 0.3831 - mape: 11.6768
Epoch 34: val_loss did not improve from 0.37046
318/318 [=====] - 0s 1ms/step - loss: 0.3861 - mse:
0.5041 - rmse: 0.7100 - mae: 0.3861 - mape: 11.7833 - val_loss: 0.3938 -
val_mse: 0.5003 - val_rmse: 0.7073 - val_mae: 0.3938 - val_mape: 12.2329 - lr:
0.0010
Epoch 35/2000
281/318 [=====>...] - ETA: 0s - loss: 0.3796 - mse: 0.4828
- rmse: 0.6949 - mae: 0.3796 - mape: 11.6169
Epoch 35: val_loss did not improve from 0.37046
318/318 [=====] - 0s 1ms/step - loss: 0.3776 - mse:
0.4787 - rmse: 0.6919 - mae: 0.3776 - mape: 11.5893 - val_loss: 0.3853 -
val_mse: 0.4813 - val_rmse: 0.6937 - val_mae: 0.3853 - val_mape: 11.9809 - lr:
0.0010
Epoch 36/2000
294/318 [=====>...] - ETA: 0s - loss: 0.3819 - mse: 0.5017
- rmse: 0.7083 - mae: 0.3819 - mape: 11.6325
Epoch 36: val_loss did not improve from 0.37046
318/318 [=====] - 0s 1ms/step - loss: 0.3833 - mse:
0.5014 - rmse: 0.7081 - mae: 0.3833 - mape: 11.6805 - val_loss: 0.3861 -
val_mse: 0.5618 - val_rmse: 0.7496 - val_mae: 0.3861 - val_mape: 11.4726 - lr:
0.0010
Epoch 37/2000
286/318 [=====>...] - ETA: 0s - loss: 0.3919 - mse: 0.5263
- rmse: 0.7255 - mae: 0.3919 - mape: 11.8227
Epoch 37: val_loss did not improve from 0.37046
318/318 [=====] - 0s 1ms/step - loss: 0.3912 - mse:
0.5351 - rmse: 0.7315 - mae: 0.3912 - mape: 11.7178 - val_loss: 0.4027 -
val_mse: 0.6277 - val_rmse: 0.7923 - val_mae: 0.4027 - val_mape: 11.2631 - lr:
0.0010
Epoch 38/2000
293/318 [=====>...] - ETA: 0s - loss: 0.3918 - mse: 0.5223
- rmse: 0.7227 - mae: 0.3918 - mape: 11.8428
Epoch 38: val_loss did not improve from 0.37046
318/318 [=====] - 0s 1ms/step - loss: 0.3893 - mse:
0.5152 - rmse: 0.7178 - mae: 0.3893 - mape: 11.7930 - val_loss: 0.3731 -
val_mse: 0.4752 - val_rmse: 0.6893 - val_mae: 0.3731 - val_mape: 11.4145 - lr:

0.0010
Epoch 39/2000
294/318 [=====>...] - ETA: 0s - loss: 0.3733 - mse: 0.4653
- rmse: 0.6821 - mae: 0.3733 - mape: 11.5458
Epoch 39: val_loss improved from 0.37046 to 0.36373, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.3755 - mse:
0.4678 - rmse: 0.6839 - mae: 0.3755 - mape: 11.6219 - val_loss: 0.3637 -
val_mse: 0.4446 - val_rmse: 0.6668 - val_mae: 0.3637 - val_mape: 11.2631 - lr:
0.0010
Epoch 40/2000
278/318 [=====>...] - ETA: 0s - loss: 0.3985 - mse: 0.5525
- rmse: 0.7433 - mae: 0.3985 - mape: 11.9609
Epoch 40: val_loss did not improve from 0.36373
318/318 [=====] - 0s 1ms/step - loss: 0.3929 - mse:
0.5349 - rmse: 0.7314 - mae: 0.3929 - mape: 11.8416 - val_loss: 0.3854 -
val_mse: 0.4398 - val_rmse: 0.6632 - val_mae: 0.3854 - val_mape: 12.4710 - lr:
0.0010
Epoch 41/2000
289/318 [=====>...] - ETA: 0s - loss: 0.3734 - mse: 0.4621
- rmse: 0.6798 - mae: 0.3734 - mape: 11.5546
Epoch 41: val_loss did not improve from 0.36373
318/318 [=====] - 0s 1ms/step - loss: 0.3719 - mse:
0.4626 - rmse: 0.6801 - mae: 0.3719 - mape: 11.5036 - val_loss: 0.3728 -
val_mse: 0.4642 - val_rmse: 0.6813 - val_mae: 0.3728 - val_mape: 11.3743 - lr:
0.0010
Epoch 42/2000
291/318 [=====>...] - ETA: 0s - loss: 0.3698 - mse: 0.4535
- rmse: 0.6735 - mae: 0.3698 - mape: 11.4913
Epoch 42: val_loss did not improve from 0.36373
318/318 [=====] - 0s 1ms/step - loss: 0.3738 - mse:
0.4648 - rmse: 0.6818 - mae: 0.3738 - mape: 11.5921 - val_loss: 0.4383 -
val_mse: 0.7336 - val_rmse: 0.8565 - val_mae: 0.4383 - val_mape: 12.3814 - lr:
0.0010
Epoch 43/2000
283/318 [=====>...] - ETA: 0s - loss: 0.3762 - mse: 0.4808
- rmse: 0.6934 - mae: 0.3762 - mape: 11.5385
Epoch 43: val_loss did not improve from 0.36373
318/318 [=====] - 0s 1ms/step - loss: 0.3794 - mse:
0.4865 - rmse: 0.6975 - mae: 0.3794 - mape: 11.6423 - val_loss: 0.3883 -
val_mse: 0.5491 - val_rmse: 0.7410 - val_mae: 0.3883 - val_mape: 11.5569 - lr:
0.0010
Epoch 44/2000
285/318 [=====>...] - ETA: 0s - loss: 0.3908 - mse: 0.5402
- rmse: 0.7350 - mae: 0.3908 - mape: 11.6451
Epoch 44: val_loss did not improve from 0.36373
318/318 [=====] - 0s 1ms/step - loss: 0.3899 - mse:
0.5336 - rmse: 0.7304 - mae: 0.3899 - mape: 11.6674 - val_loss: 0.3766 -

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val_mse: 0.4757 - val_rmse: 0.6897 - val_mae: 0.3766 - val_mape: 11.4655 - lr:
0.0010
Epoch 45/2000
294/318 [=====>...] - ETA: 0s - loss: 0.3852 - mse: 0.5080
- rmse: 0.7128 - mae: 0.3852 - mape: 11.7003
Epoch 45: val_loss did not improve from 0.36373
318/318 [=====] - 0s 1ms/step - loss: 0.3845 - mse:
0.5048 - rmse: 0.7105 - mae: 0.3845 - mape: 11.7002 - val_loss: 0.4012 -
val_mse: 0.4930 - val_rmse: 0.7021 - val_mae: 0.4012 - val_mape: 12.4515 - lr:
0.0010
Epoch 46/2000
299/318 [=====>..] - ETA: 0s - loss: 0.3790 - mse: 0.4727
- rmse: 0.6875 - mae: 0.3790 - mape: 11.8156
Epoch 46: val_loss did not improve from 0.36373
318/318 [=====] - 0s 1ms/step - loss: 0.3776 - mse:
0.4702 - rmse: 0.6857 - mae: 0.3776 - mape: 11.7670 - val_loss: 0.3797 -
val_mse: 0.4295 - val_rmse: 0.6554 - val_mae: 0.3797 - val_mape: 12.1105 - lr:
0.0010
Epoch 47/2000
274/318 [=====>...] - ETA: 0s - loss: 0.3609 - mse: 0.4327
- rmse: 0.6578 - mae: 0.3609 - mape: 11.3462
Epoch 47: val_loss did not improve from 0.36373
318/318 [=====] - 0s 1ms/step - loss: 0.3609 - mse:
0.4332 - rmse: 0.6582 - mae: 0.3609 - mape: 11.3129 - val_loss: 0.3662 -
val_mse: 0.4092 - val_rmse: 0.6397 - val_mae: 0.3662 - val_mape: 11.8139 - lr:
0.0010
Epoch 48/2000
263/318 [=====>...] - ETA: 0s - loss: 0.3739 - mse: 0.4672
- rmse: 0.6835 - mae: 0.3739 - mape: 11.6092
Epoch 48: val_loss did not improve from 0.36373
318/318 [=====] - 0s 2ms/step - loss: 0.3730 - mse:
0.4623 - rmse: 0.6800 - mae: 0.3730 - mape: 11.6280 - val_loss: 0.3796 -
val_mse: 0.4746 - val_rmse: 0.6889 - val_mae: 0.3796 - val_mape: 12.0368 - lr:
0.0010
Epoch 49/2000
274/318 [=====>...] - ETA: 0s - loss: 0.3696 - mse: 0.4515
- rmse: 0.6719 - mae: 0.3696 - mape: 11.5861
Epoch 49: val_loss improved from 0.36373 to 0.34942, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.3669 - mse:
0.4451 - rmse: 0.6671 - mae: 0.3669 - mape: 11.5206 - val_loss: 0.3494 -
val_mse: 0.4055 - val_rmse: 0.6368 - val_mae: 0.3494 - val_mape: 10.9486 - lr:
0.0010
Epoch 50/2000
310/318 [=====>.] - ETA: 0s - loss: 0.3608 - mse: 0.4341
- rmse: 0.6589 - mae: 0.3608 - mape: 11.3089
Epoch 50: val_loss did not improve from 0.34942
318/318 [=====] - 0s 2ms/step - loss: 0.3608 - mse:

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0.4331 - rmse: 0.6581 - mae: 0.3608 - mape: 11.3175 - val_loss: 0.3535 -
val_mse: 0.3839 - val_rmse: 0.6196 - val_mae: 0.3535 - val_mape: 11.4883 - lr:
0.0010

Epoch 51/2000
271/318 [=====>...] - ETA: 0s - loss: 0.3532 - mse: 0.4132
- rmse: 0.6428 - mae: 0.3532 - mape: 11.1678
Epoch 51: val_loss did not improve from 0.34942
318/318 [=====] - 0s 2ms/step - loss: 0.3610 - mse:
0.4399 - rmse: 0.6632 - mae: 0.3610 - mape: 11.3136 - val_loss: 0.4243 -
val_mse: 0.7246 - val_rmse: 0.8512 - val_mae: 0.4243 - val_mape: 11.5844 - lr:
0.0010

Epoch 52/2000
267/318 [=====>...] - ETA: 0s - loss: 0.3720 - mse: 0.4642
- rmse: 0.6813 - mae: 0.3720 - mape: 11.6426
Epoch 52: val_loss did not improve from 0.34942
318/318 [=====] - 0s 2ms/step - loss: 0.3707 - mse:
0.4627 - rmse: 0.6802 - mae: 0.3707 - mape: 11.5706 - val_loss: 0.3842 -
val_mse: 0.5801 - val_rmse: 0.7616 - val_mae: 0.3842 - val_mape: 11.3419 - lr:
0.0010

Epoch 53/2000
270/318 [=====>...] - ETA: 0s - loss: 0.3568 - mse: 0.4284
- rmse: 0.6545 - mae: 0.3568 - mape: 11.2321
Epoch 53: val_loss did not improve from 0.34942
318/318 [=====] - 0s 2ms/step - loss: 0.3573 - mse:
0.4297 - rmse: 0.6555 - mae: 0.3573 - mape: 11.2402 - val_loss: 0.3755 -
val_mse: 0.4268 - val_rmse: 0.6533 - val_mae: 0.3755 - val_mape: 11.5763 - lr:
0.0010

Epoch 54/2000
275/318 [=====>...] - ETA: 0s - loss: 0.3579 - mse: 0.4279
- rmse: 0.6542 - mae: 0.3579 - mape: 11.1051
Epoch 54: val_loss did not improve from 0.34942
318/318 [=====] - 0s 1ms/step - loss: 0.3640 - mse:
0.4564 - rmse: 0.6755 - mae: 0.3640 - mape: 11.1252 - val_loss: 0.4169 -
val_mse: 0.6325 - val_rmse: 0.7953 - val_mae: 0.4169 - val_mape: 12.6343 - lr:
0.0010

Epoch 55/2000
276/318 [=====>...] - ETA: 0s - loss: 0.3729 - mse: 0.4652
- rmse: 0.6821 - mae: 0.3729 - mape: 11.6456
Epoch 55: val_loss did not improve from 0.34942
318/318 [=====] - 1s 2ms/step - loss: 0.3737 - mse:
0.4645 - rmse: 0.6816 - mae: 0.3737 - mape: 11.6808 - val_loss: 0.3562 -
val_mse: 0.4343 - val_rmse: 0.6590 - val_mae: 0.3562 - val_mape: 11.0780 - lr:
0.0010

Epoch 56/2000
270/318 [=====>...] - ETA: 0s - loss: 0.3735 - mse: 0.4719
- rmse: 0.6870 - mae: 0.3735 - mape: 11.6650
Epoch 56: val_loss did not improve from 0.34942
318/318 [=====] - 0s 1ms/step - loss: 0.3780 - mse:

0.4891 - rmse: 0.6994 - mae: 0.3780 - mape: 11.6418 - val_loss: 0.3963 -
val_mse: 0.5638 - val_rmse: 0.7509 - val_mae: 0.3963 - val_mape: 11.7644 - lr:
0.0010

Epoch 57/2000
287/318 [=====>...] - ETA: 0s - loss: 0.3694 - mse: 0.4692
- rmse: 0.6850 - mae: 0.3694 - mape: 11.4968
Epoch 57: val_loss did not improve from 0.34942
318/318 [=====] - 0s 1ms/step - loss: 0.3682 - mse:
0.4653 - rmse: 0.6821 - mae: 0.3682 - mape: 11.4606 - val_loss: 0.3685 -
val_mse: 0.4140 - val_rmse: 0.6434 - val_mae: 0.3685 - val_mape: 12.0785 - lr:
0.0010

Epoch 58/2000
291/318 [=====>...] - ETA: 0s - loss: 0.3597 - mse: 0.4215
- rmse: 0.6493 - mae: 0.3597 - mape: 11.4458
Epoch 58: val_loss did not improve from 0.34942
318/318 [=====] - 0s 1ms/step - loss: 0.3606 - mse:
0.4321 - rmse: 0.6573 - mae: 0.3606 - mape: 11.4123 - val_loss: 0.4252 -
val_mse: 0.5636 - val_rmse: 0.7507 - val_mae: 0.4252 - val_mape: 13.1040 - lr:
0.0010

Epoch 59/2000
282/318 [=====>...] - ETA: 0s - loss: 0.3834 - mse: 0.5241
- rmse: 0.7239 - mae: 0.3834 - mape: 11.6402
Epoch 59: val_loss did not improve from 0.34942
318/318 [=====] - 0s 1ms/step - loss: 0.3871 - mse:
0.5265 - rmse: 0.7256 - mae: 0.3871 - mape: 11.7915 - val_loss: 0.3866 -
val_mse: 0.4651 - val_rmse: 0.6820 - val_mae: 0.3866 - val_mape: 12.7831 - lr:
0.0010

Epoch 60/2000
295/318 [=====>...] - ETA: 0s - loss: 0.3840 - mse: 0.5072
- rmse: 0.7122 - mae: 0.3840 - mape: 11.9667
Epoch 60: val_loss did not improve from 0.34942
318/318 [=====] - 0s 1ms/step - loss: 0.3854 - mse:
0.5106 - rmse: 0.7146 - mae: 0.3854 - mape: 12.0199 - val_loss: 0.4222 -
val_mse: 0.5124 - val_rmse: 0.7158 - val_mae: 0.4222 - val_mape: 14.4078 - lr:
0.0010

Epoch 61/2000
278/318 [=====>...] - ETA: 0s - loss: 0.3811 - mse: 0.4998
- rmse: 0.7069 - mae: 0.3811 - mape: 11.9080
Epoch 61: val_loss did not improve from 0.34942
318/318 [=====] - 0s 1ms/step - loss: 0.3777 - mse:
0.4902 - rmse: 0.7002 - mae: 0.3777 - mape: 11.8305 - val_loss: 0.3571 -
val_mse: 0.4429 - val_rmse: 0.6655 - val_mae: 0.3571 - val_mape: 11.2607 - lr:
0.0010

Epoch 62/2000
295/318 [=====>...] - ETA: 0s - loss: 0.3767 - mse: 0.5183
- rmse: 0.7199 - mae: 0.3767 - mape: 11.5215
Epoch 62: val_loss did not improve from 0.34942
318/318 [=====] - 0s 1ms/step - loss: 0.3766 - mse:

0.5157 - rmse: 0.7181 - mae: 0.3766 - mape: 11.5382 - val_loss: 0.3778 -
val_mse: 0.4861 - val_rmse: 0.6972 - val_mae: 0.3778 - val_mape: 11.5432 - lr:
0.0010

Epoch 63/2000

298/318 [=====>..] - ETA: 0s - loss: 0.3659 - mse: 0.4599
- rmse: 0.6782 - mae: 0.3659 - mape: 11.5536

Epoch 63: val_loss did not improve from 0.34942

318/318 [=====] - 0s 1ms/step - loss: 0.3658 - mse:
0.4600 - rmse: 0.6783 - mae: 0.3658 - mape: 11.5404 - val_loss: 0.3626 -
val_mse: 0.4293 - val_rmse: 0.6552 - val_mae: 0.3626 - val_mape: 11.7844 - lr:
0.0010

Epoch 64/2000

294/318 [=====>...] - ETA: 0s - loss: 0.3620 - mse: 0.4499
- rmse: 0.6708 - mae: 0.3620 - mape: 11.4269

Epoch 64: val_loss did not improve from 0.34942

318/318 [=====] - 0s 1ms/step - loss: 0.3621 - mse:
0.4485 - rmse: 0.6697 - mae: 0.3621 - mape: 11.4362 - val_loss: 0.3518 -
val_mse: 0.4168 - val_rmse: 0.6456 - val_mae: 0.3518 - val_mape: 11.4054 - lr:
0.0010

Epoch 65/2000

308/318 [=====>.] - ETA: 0s - loss: 0.3624 - mse: 0.4414
- rmse: 0.6644 - mae: 0.3624 - mape: 11.4483

Epoch 65: val_loss did not improve from 0.34942

318/318 [=====] - 0s 1ms/step - loss: 0.3620 - mse:
0.4411 - rmse: 0.6641 - mae: 0.3620 - mape: 11.4338 - val_loss: 0.3569 -
val_mse: 0.4311 - val_rmse: 0.6566 - val_mae: 0.3569 - val_mape: 11.3541 - lr:
0.0010

Epoch 66/2000

283/318 [=====>...] - ETA: 0s - loss: 0.3592 - mse: 0.4331
- rmse: 0.6581 - mae: 0.3592 - mape: 11.3282

Epoch 66: val_loss improved from 0.34942 to 0.34400, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 0s 1ms/step - loss: 0.3563 - mse:
0.4262 - rmse: 0.6529 - mae: 0.3563 - mape: 11.2762 - val_loss: 0.3440 -
val_mse: 0.3975 - val_rmse: 0.6305 - val_mae: 0.3440 - val_mape: 10.8348 - lr:
0.0010

Epoch 67/2000

286/318 [=====>...] - ETA: 0s - loss: 0.3593 - mse: 0.4266
- rmse: 0.6532 - mae: 0.3593 - mape: 11.2948

Epoch 67: val_loss did not improve from 0.34400

318/318 [=====] - 0s 1ms/step - loss: 0.3572 - mse:
0.4206 - rmse: 0.6485 - mae: 0.3572 - mape: 11.2284 - val_loss: 0.3514 -
val_mse: 0.4030 - val_rmse: 0.6349 - val_mae: 0.3514 - val_mape: 11.0764 - lr:
0.0010

Epoch 68/2000

289/318 [=====>...] - ETA: 0s - loss: 0.3426 - mse: 0.3908
- rmse: 0.6252 - mae: 0.3426 - mape: 10.7502

Epoch 68: val_loss did not improve from 0.34400

318/318 [=====] - 0s 1ms/step - loss: 0.3436 - mse: 0.3932 - rmse: 0.6271 - mae: 0.3436 - mape: 10.7727 - val_loss: 0.3557 - val_mse: 0.4094 - val_rmse: 0.6398 - val_mae: 0.3557 - val_mape: 10.7363 - lr: 0.0010

Epoch 69/2000

264/318 [=====>...] - ETA: 0s - loss: 0.3481 - mse: 0.3974 - rmse: 0.6304 - mae: 0.3481 - mape: 10.8807

Epoch 69: val_loss improved from 0.34400 to 0.32969, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 0s 2ms/step - loss: 0.3467 - mse: 0.3975 - rmse: 0.6304 - mae: 0.3467 - mape: 10.7987 - val_loss: 0.3297 - val_mse: 0.3663 - val_rmse: 0.6052 - val_mae: 0.3297 - val_mape: 9.6970 - lr: 0.0010

Epoch 70/2000

315/318 [=====>.] - ETA: 0s - loss: 0.3556 - mse: 0.4031 - rmse: 0.6349 - mae: 0.3556 - mape: 10.9638

Epoch 70: val_loss did not improve from 0.32969

318/318 [=====] - 0s 2ms/step - loss: 0.3556 - mse: 0.4026 - rmse: 0.6345 - mae: 0.3556 - mape: 10.9698 - val_loss: 0.3547 - val_mse: 0.3979 - val_rmse: 0.6308 - val_mae: 0.3547 - val_mape: 11.4647 - lr: 0.0010

Epoch 71/2000

277/318 [=====>...] - ETA: 0s - loss: 0.3373 - mse: 0.3534 - rmse: 0.5945 - mae: 0.3373 - mape: 10.3325

Epoch 71: val_loss did not improve from 0.32969

318/318 [=====] - 0s 1ms/step - loss: 0.3395 - mse: 0.3624 - rmse: 0.6020 - mae: 0.3395 - mape: 10.3783 - val_loss: 0.4006 - val_mse: 0.6311 - val_rmse: 0.7944 - val_mae: 0.4006 - val_mape: 11.5481 - lr: 0.0010

Epoch 72/2000

280/318 [=====>...] - ETA: 0s - loss: 0.3374 - mse: 0.3643 - rmse: 0.6036 - mae: 0.3374 - mape: 10.3796

Epoch 72: val_loss improved from 0.32969 to 0.30251, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 0s 2ms/step - loss: 0.3365 - mse: 0.3621 - rmse: 0.6017 - mae: 0.3365 - mape: 10.3367 - val_loss: 0.3025 - val_mse: 0.3068 - val_rmse: 0.5539 - val_mae: 0.3025 - val_mape: 8.8518 - lr: 0.0010

Epoch 73/2000

317/318 [=====>.] - ETA: 0s - loss: 0.3241 - mse: 0.3355 - rmse: 0.5792 - mae: 0.3241 - mape: 9.9974

Epoch 73: val_loss did not improve from 0.30251

318/318 [=====] - 0s 2ms/step - loss: 0.3240 - mse: 0.3354 - rmse: 0.5791 - mae: 0.3240 - mape: 9.9967 - val_loss: 0.3040 - val_mse: 0.3024 - val_rmse: 0.5499 - val_mae: 0.3040 - val_mape: 9.7701 - lr: 0.0010

Epoch 74/2000

271/318 [=====>...] - ETA: 0s - loss: 0.3262 - mse: 0.3424 - rmse: 0.5852 - mae: 0.3262 - mape: 10.0804

Epoch 74: val_loss did not improve from 0.30251
318/318 [=====] - 0s 1ms/step - loss: 0.3241 - mse:
0.3361 - rmse: 0.5797 - mae: 0.3241 - mape: 10.0141 - val_loss: 0.3354 -
val_mse: 0.3609 - val_rmse: 0.6008 - val_mae: 0.3354 - val_mape: 10.1767 - lr:
0.0010
Epoch 75/2000
277/318 [=====>...] - ETA: 0s - loss: 0.3175 - mse: 0.3147
- rmse: 0.5610 - mae: 0.3175 - mape: 9.8720
Epoch 75: val_loss improved from 0.30251 to 0.29135, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.3187 - mse:
0.3173 - rmse: 0.5633 - mae: 0.3187 - mape: 9.9088 - val_loss: 0.2913 - val_mse:
0.2808 - val_rmse: 0.5299 - val_mae: 0.2913 - val_mape: 8.9902 - lr: 0.0010
Epoch 76/2000
307/318 [=====>..] - ETA: 0s - loss: 0.3344 - mse: 0.3820
- rmse: 0.6181 - mae: 0.3344 - mape: 10.2920
Epoch 76: val_loss did not improve from 0.29135
318/318 [=====] - 0s 2ms/step - loss: 0.3347 - mse:
0.3832 - rmse: 0.6190 - mae: 0.3347 - mape: 10.3061 - val_loss: 0.4013 -
val_mse: 0.6517 - val_rmse: 0.8073 - val_mae: 0.4013 - val_mape: 11.6764 - lr:
0.0010
Epoch 77/2000
266/318 [=====>...] - ETA: 0s - loss: 0.3481 - mse: 0.4169
- rmse: 0.6457 - mae: 0.3481 - mape: 10.6645
Epoch 77: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3457 - mse:
0.4113 - rmse: 0.6414 - mae: 0.3457 - mape: 10.6277 - val_loss: 0.3202 -
val_mse: 0.3531 - val_rmse: 0.5942 - val_mae: 0.3202 - val_mape: 9.7378 - lr:
0.0010
Epoch 78/2000
272/318 [=====>...] - ETA: 0s - loss: 0.3473 - mse: 0.4297
- rmse: 0.6555 - mae: 0.3473 - mape: 10.5713
Epoch 78: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3453 - mse:
0.4238 - rmse: 0.6510 - mae: 0.3453 - mape: 10.4877 - val_loss: 0.3366 -
val_mse: 0.3537 - val_rmse: 0.5947 - val_mae: 0.3366 - val_mape: 10.7114 - lr:
0.0010
Epoch 79/2000
295/318 [=====>...] - ETA: 0s - loss: 0.3459 - mse: 0.4267
- rmse: 0.6532 - mae: 0.3459 - mape: 10.4752
Epoch 79: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3488 - mse:
0.4364 - rmse: 0.6606 - mae: 0.3488 - mape: 10.5725 - val_loss: 0.3775 -
val_mse: 0.5772 - val_rmse: 0.7598 - val_mae: 0.3775 - val_mape: 11.2049 - lr:
0.0010
Epoch 80/2000
305/318 [=====>..] - ETA: 0s - loss: 0.3813 - mse: 0.5486
- rmse: 0.7407 - mae: 0.3813 - mape: 11.3572

Epoch 80: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3803 - mse:
0.5459 - rmse: 0.7388 - mae: 0.3803 - mape: 11.3302 - val_loss: 0.3772 -
val_mse: 0.4660 - val_rmse: 0.6826 - val_mae: 0.3772 - val_mape: 11.7831 - lr:
0.0010

Epoch 81/2000
283/318 [=====>...] - ETA: 0s - loss: 0.3632 - mse: 0.4707
- rmse: 0.6860 - mae: 0.3632 - mape: 11.1257

Epoch 81: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3611 - mse:
0.4651 - rmse: 0.6820 - mae: 0.3611 - mape: 11.0396 - val_loss: 0.3516 -
val_mse: 0.4270 - val_rmse: 0.6534 - val_mae: 0.3516 - val_mape: 10.9410 - lr:
0.0010

Epoch 82/2000
295/318 [=====>...] - ETA: 0s - loss: 0.3548 - mse: 0.4342
- rmse: 0.6589 - mae: 0.3548 - mape: 10.9797

Epoch 82: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3538 - mse:
0.4327 - rmse: 0.6578 - mae: 0.3538 - mape: 10.9328 - val_loss: 0.3531 -
val_mse: 0.4438 - val_rmse: 0.6662 - val_mae: 0.3531 - val_mape: 11.6282 - lr:
0.0010

Epoch 83/2000
294/318 [=====>...] - ETA: 0s - loss: 0.3366 - mse: 0.3917
- rmse: 0.6259 - mae: 0.3366 - mape: 10.3350

Epoch 83: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3384 - mse:
0.3950 - rmse: 0.6285 - mae: 0.3384 - mape: 10.3560 - val_loss: 0.3260 -
val_mse: 0.3509 - val_rmse: 0.5923 - val_mae: 0.3260 - val_mape: 10.2136 - lr:
0.0010

Epoch 84/2000
282/318 [=====>...] - ETA: 0s - loss: 0.3380 - mse: 0.3768
- rmse: 0.6138 - mae: 0.3380 - mape: 10.5025

Epoch 84: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3380 - mse:
0.3766 - rmse: 0.6136 - mae: 0.3380 - mape: 10.5151 - val_loss: 0.3141 -
val_mse: 0.3321 - val_rmse: 0.5763 - val_mae: 0.3141 - val_mape: 9.2847 - lr:
0.0010

Epoch 85/2000
296/318 [=====>...] - ETA: 0s - loss: 0.3375 - mse: 0.3746
- rmse: 0.6121 - mae: 0.3375 - mape: 10.5034

Epoch 85: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3401 - mse:
0.3768 - rmse: 0.6138 - mae: 0.3401 - mape: 10.5788 - val_loss: 0.3463 -
val_mse: 0.3329 - val_rmse: 0.5770 - val_mae: 0.3463 - val_mape: 11.4382 - lr:
0.0010

Epoch 86/2000
281/318 [=====>...] - ETA: 0s - loss: 0.3369 - mse: 0.3742
- rmse: 0.6117 - mae: 0.3369 - mape: 10.4861

Epoch 86: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3375 - mse:
0.3713 - rmse: 0.6093 - mae: 0.3375 - mape: 10.5225 - val_loss: 0.3184 -
val_mse: 0.3350 - val_rmse: 0.5788 - val_mae: 0.3184 - val_mape: 9.6193 - lr:
0.0010
Epoch 87/2000
301/318 [=====>..] - ETA: 0s - loss: 0.3364 - mse: 0.3751
- rmse: 0.6125 - mae: 0.3364 - mape: 10.3439
Epoch 87: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3364 - mse:
0.3729 - rmse: 0.6107 - mae: 0.3364 - mape: 10.3837 - val_loss: 0.2992 -
val_mse: 0.2816 - val_rmse: 0.5307 - val_mae: 0.2992 - val_mape: 8.9987 - lr:
0.0010
Epoch 88/2000
285/318 [=====>...] - ETA: 0s - loss: 0.3097 - mse: 0.3074
- rmse: 0.5544 - mae: 0.3097 - mape: 9.7205
Epoch 88: val_loss did not improve from 0.29135
318/318 [=====] - 0s 1ms/step - loss: 0.3104 - mse:
0.3106 - rmse: 0.5573 - mae: 0.3104 - mape: 9.7020 - val_loss: 0.2958 - val_mse:
0.2625 - val_rmse: 0.5124 - val_mae: 0.2958 - val_mape: 9.6117 - lr: 0.0010
Epoch 89/2000
291/318 [=====>...] - ETA: 0s - loss: 0.3113 - mse: 0.3113
- rmse: 0.5579 - mae: 0.3113 - mape: 9.7307
Epoch 89: val_loss improved from 0.29135 to 0.28459, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.3113 - mse:
0.3107 - rmse: 0.5574 - mae: 0.3113 - mape: 9.7371 - val_loss: 0.2846 - val_mse:
0.2632 - val_rmse: 0.5130 - val_mae: 0.2846 - val_mape: 8.9404 - lr: 0.0010
Epoch 90/2000
274/318 [=====>...] - ETA: 0s - loss: 0.3019 - mse: 0.2944
- rmse: 0.5426 - mae: 0.3019 - mape: 9.5703
Epoch 90: val_loss did not improve from 0.28459
318/318 [=====] - 0s 2ms/step - loss: 0.3030 - mse:
0.2972 - rmse: 0.5452 - mae: 0.3030 - mape: 9.5752 - val_loss: 0.3038 - val_mse:
0.2972 - val_rmse: 0.5451 - val_mae: 0.3038 - val_mape: 9.6611 - lr: 0.0010
Epoch 91/2000
288/318 [=====>...] - ETA: 0s - loss: 0.3116 - mse: 0.3207
- rmse: 0.5663 - mae: 0.3116 - mape: 9.7706
Epoch 91: val_loss did not improve from 0.28459
318/318 [=====] - 0s 1ms/step - loss: 0.3126 - mse:
0.3208 - rmse: 0.5664 - mae: 0.3126 - mape: 9.7888 - val_loss: 0.2999 - val_mse:
0.2727 - val_rmse: 0.5222 - val_mae: 0.2999 - val_mape: 9.4776 - lr: 0.0010
Epoch 92/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2973 - mse: 0.2875
- rmse: 0.5361 - mae: 0.2973 - mape: 9.3560
Epoch 92: val_loss did not improve from 0.28459
318/318 [=====] - 0s 2ms/step - loss: 0.2975 - mse:
0.2876 - rmse: 0.5363 - mae: 0.2975 - mape: 9.3617 - val_loss: 0.2865 - val_mse:

0.2693 - val_rmse: 0.5189 - val_mae: 0.2865 - val_mape: 9.4604 - lr: 0.0010
Epoch 93/2000
278/318 [=====>...] - ETA: 0s - loss: 0.3061 - mse: 0.3087
- rmse: 0.5556 - mae: 0.3061 - mape: 9.6529
Epoch 93: val_loss did not improve from 0.28459
318/318 [=====] - 0s 1ms/step - loss: 0.3067 - mse:
0.3092 - rmse: 0.5560 - mae: 0.3067 - mape: 9.6068 - val_loss: 0.2967 - val_mse:
0.2955 - val_rmse: 0.5436 - val_mae: 0.2967 - val_mape: 9.2404 - lr: 0.0010
Epoch 94/2000
276/318 [=====>...] - ETA: 0s - loss: 0.3059 - mse: 0.3036
- rmse: 0.5510 - mae: 0.3059 - mape: 9.4784
Epoch 94: val_loss did not improve from 0.28459
318/318 [=====] - 0s 1ms/step - loss: 0.3044 - mse:
0.3004 - rmse: 0.5481 - mae: 0.3044 - mape: 9.4669 - val_loss: 0.2920 - val_mse:
0.2879 - val_rmse: 0.5366 - val_mae: 0.2920 - val_mape: 8.6182 - lr: 0.0010
Epoch 95/2000
271/318 [=====>...] - ETA: 0s - loss: 0.2970 - mse: 0.2927
- rmse: 0.5410 - mae: 0.2970 - mape: 9.2233
Epoch 95: val_loss did not improve from 0.28459
318/318 [=====] - 0s 1ms/step - loss: 0.3003 - mse:
0.2985 - rmse: 0.5463 - mae: 0.3003 - mape: 9.3400 - val_loss: 0.3541 - val_mse:
0.3719 - val_rmse: 0.6098 - val_mae: 0.3541 - val_mape: 12.3791 - lr: 0.0010
Epoch 96/2000
318/318 [=====] - ETA: 0s - loss: 0.2958 - mse: 0.2849
- rmse: 0.5338 - mae: 0.2958 - mape: 9.2450
Epoch 96: val_loss did not improve from 0.28459
318/318 [=====] - 0s 2ms/step - loss: 0.2958 - mse:
0.2849 - rmse: 0.5338 - mae: 0.2958 - mape: 9.2450 - val_loss: 0.2885 - val_mse:
0.2752 - val_rmse: 0.5246 - val_mae: 0.2885 - val_mape: 8.7430 - lr: 0.0010
Epoch 97/2000
270/318 [=====>...] - ETA: 0s - loss: 0.2975 - mse: 0.2928
- rmse: 0.5411 - mae: 0.2975 - mape: 9.3536
Epoch 97: val_loss did not improve from 0.28459
318/318 [=====] - 0s 2ms/step - loss: 0.3097 - mse:
0.3211 - rmse: 0.5666 - mae: 0.3097 - mape: 9.6540 - val_loss: 0.3379 - val_mse:
0.3884 - val_rmse: 0.6232 - val_mae: 0.3379 - val_mape: 9.4490 - lr: 0.0010
Epoch 98/2000
273/318 [=====>...] - ETA: 0s - loss: 0.3235 - mse: 0.3628
- rmse: 0.6024 - mae: 0.3235 - mape: 9.7678
Epoch 98: val_loss did not improve from 0.28459
318/318 [=====] - 0s 1ms/step - loss: 0.3207 - mse:
0.3549 - rmse: 0.5957 - mae: 0.3207 - mape: 9.7068 - val_loss: 0.3178 - val_mse:
0.3138 - val_rmse: 0.5601 - val_mae: 0.3178 - val_mape: 10.3513 - lr: 0.0010
Epoch 99/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2934 - mse: 0.2873
- rmse: 0.5360 - mae: 0.2934 - mape: 9.1538
Epoch 99: val_loss improved from 0.28459 to 0.28407, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5

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318/318 [=====] - 0s 1ms/step - loss: 0.2938 - mse:
0.2879 - rmse: 0.5366 - mae: 0.2938 - mape: 9.1527 - val_loss: 0.2841 - val_mse:
0.2716 - val_rmse: 0.5212 - val_mae: 0.2841 - val_mape: 9.3026 - lr: 0.0010
Epoch 100/2000
269/318 [=====>...] - ETA: 0s - loss: 0.2916 - mse: 0.2811
- rmse: 0.5302 - mae: 0.2916 - mape: 9.1308
Epoch 100: val_loss did not improve from 0.28407
318/318 [=====] - 0s 1ms/step - loss: 0.2908 - mse:
0.2804 - rmse: 0.5295 - mae: 0.2908 - mape: 9.1205 - val_loss: 0.2953 - val_mse:
0.2891 - val_rmse: 0.5377 - val_mae: 0.2953 - val_mape: 9.7069 - lr: 0.0010
Epoch 101/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2921 - mse: 0.2827
- rmse: 0.5317 - mae: 0.2921 - mape: 9.1463
Epoch 101: val_loss did not improve from 0.28407
318/318 [=====] - 0s 1ms/step - loss: 0.2919 - mse:
0.2827 - rmse: 0.5317 - mae: 0.2919 - mape: 9.1387 - val_loss: 0.3402 - val_mse:
0.4554 - val_rmse: 0.6748 - val_mae: 0.3402 - val_mape: 9.3631 - lr: 0.0010
Epoch 102/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2926 - mse: 0.2847
- rmse: 0.5336 - mae: 0.2926 - mape: 9.1780
Epoch 102: val_loss improved from 0.28407 to 0.27608, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2923 - mse:
0.2835 - rmse: 0.5324 - mae: 0.2923 - mape: 9.1809 - val_loss: 0.2761 - val_mse:
0.2525 - val_rmse: 0.5025 - val_mae: 0.2761 - val_mape: 8.8206 - lr: 0.0010
Epoch 103/2000
289/318 [=====>...] - ETA: 0s - loss: 0.2913 - mse: 0.2873
- rmse: 0.5360 - mae: 0.2913 - mape: 9.1144
Epoch 103: val_loss improved from 0.27608 to 0.27188, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2898 - mse:
0.2843 - rmse: 0.5332 - mae: 0.2898 - mape: 9.0795 - val_loss: 0.2719 - val_mse:
0.2529 - val_rmse: 0.5028 - val_mae: 0.2719 - val_mape: 8.7810 - lr: 0.0010
Epoch 104/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2876 - mse: 0.2774
- rmse: 0.5267 - mae: 0.2876 - mape: 9.0391
Epoch 104: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2885 - mse:
0.2782 - rmse: 0.5274 - mae: 0.2885 - mape: 9.0585 - val_loss: 0.2783 - val_mse:
0.2796 - val_rmse: 0.5288 - val_mae: 0.2783 - val_mape: 9.0049 - lr: 0.0010
Epoch 105/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2942 - mse: 0.2929
- rmse: 0.5412 - mae: 0.2942 - mape: 9.2365
Epoch 105: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2924 - mse:
0.2888 - rmse: 0.5374 - mae: 0.2924 - mape: 9.1673 - val_loss: 0.2924 - val_mse:
0.2608 - val_rmse: 0.5106 - val_mae: 0.2924 - val_mape: 9.3433 - lr: 0.0010
Epoch 106/2000

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300/318 [=====>..] - ETA: 0s - loss: 0.2852 - mse: 0.2735
- rmse: 0.5230 - mae: 0.2852 - mape: 8.9626
Epoch 106: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2855 - mse:
0.2738 - rmse: 0.5233 - mae: 0.2855 - mape: 8.9607 - val_loss: 0.3057 - val_mse:
0.3255 - val_rmse: 0.5706 - val_mae: 0.3057 - val_mape: 9.3010 - lr: 0.0010
Epoch 107/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2880 - mse: 0.2832
- rmse: 0.5322 - mae: 0.2880 - mape: 9.0490
Epoch 107: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2886 - mse:
0.2831 - rmse: 0.5321 - mae: 0.2886 - mape: 9.0873 - val_loss: 0.2904 - val_mse:
0.2853 - val_rmse: 0.5341 - val_mae: 0.2904 - val_mape: 8.8606 - lr: 0.0010
Epoch 108/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2938 - mse: 0.2874
- rmse: 0.5361 - mae: 0.2938 - mape: 9.2031
Epoch 108: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2931 - mse:
0.2875 - rmse: 0.5362 - mae: 0.2931 - mape: 9.1892 - val_loss: 0.3361 - val_mse:
0.4008 - val_rmse: 0.6331 - val_mae: 0.3361 - val_mape: 9.8339 - lr: 0.0010
Epoch 109/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2821 - mse: 0.2716
- rmse: 0.5211 - mae: 0.2821 - mape: 8.8869
Epoch 109: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2823 - mse:
0.2712 - rmse: 0.5208 - mae: 0.2823 - mape: 8.8869 - val_loss: 0.3035 - val_mse:
0.3222 - val_rmse: 0.5676 - val_mae: 0.3035 - val_mape: 9.1581 - lr: 0.0010
Epoch 110/2000
300/318 [=====>..] - ETA: 0s - loss: 0.3485 - mse: 0.4300
- rmse: 0.6558 - mae: 0.3485 - mape: 10.6939
Epoch 110: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.3447 - mse:
0.4210 - rmse: 0.6488 - mae: 0.3447 - mape: 10.5857 - val_loss: 0.2749 -
val_mse: 0.2641 - val_rmse: 0.5139 - val_mae: 0.2749 - val_mape: 8.7736 - lr:
0.0010
Epoch 111/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2910 - mse: 0.2837
- rmse: 0.5327 - mae: 0.2910 - mape: 9.1434
Epoch 111: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2904 - mse:
0.2837 - rmse: 0.5327 - mae: 0.2904 - mape: 9.1223 - val_loss: 0.2729 - val_mse:
0.2492 - val_rmse: 0.4992 - val_mae: 0.2729 - val_mape: 8.6291 - lr: 0.0010
Epoch 112/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2877 - mse: 0.2797
- rmse: 0.5289 - mae: 0.2877 - mape: 9.0112
Epoch 112: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2861 - mse:
0.2759 - rmse: 0.5253 - mae: 0.2861 - mape: 8.9705 - val_loss: 0.2829 - val_mse:

0.2664 - val_rmse: 0.5161 - val_mae: 0.2829 - val_mape: 8.7453 - lr: 0.0010
Epoch 113/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2923 - mse: 0.2912
- rmse: 0.5396 - mae: 0.2923 - mape: 9.1341
Epoch 113: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2893 - mse:
0.2841 - rmse: 0.5330 - mae: 0.2893 - mape: 9.0498 - val_loss: 0.2846 - val_mse:
0.2778 - val_rmse: 0.5270 - val_mae: 0.2846 - val_mape: 8.7092 - lr: 0.0010
Epoch 114/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2910 - mse: 0.2910
- rmse: 0.5394 - mae: 0.2910 - mape: 9.1044
Epoch 114: val_loss did not improve from 0.27188
318/318 [=====] - 0s 2ms/step - loss: 0.2912 - mse:
0.2911 - rmse: 0.5395 - mae: 0.2912 - mape: 9.0997 - val_loss: 0.3011 - val_mse:
0.2889 - val_rmse: 0.5375 - val_mae: 0.3011 - val_mape: 9.5554 - lr: 0.0010
Epoch 115/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2904 - mse: 0.2854
- rmse: 0.5342 - mae: 0.2904 - mape: 8.9797
Epoch 115: val_loss did not improve from 0.27188
318/318 [=====] - 0s 2ms/step - loss: 0.2925 - mse:
0.2893 - rmse: 0.5379 - mae: 0.2925 - mape: 9.0631 - val_loss: 0.2820 - val_mse:
0.2691 - val_rmse: 0.5188 - val_mae: 0.2820 - val_mape: 8.4383 - lr: 0.0010
Epoch 116/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2847 - mse: 0.2779
- rmse: 0.5271 - mae: 0.2847 - mape: 8.8818
Epoch 116: val_loss did not improve from 0.27188
318/318 [=====] - 0s 2ms/step - loss: 0.2846 - mse:
0.2778 - rmse: 0.5271 - mae: 0.2846 - mape: 8.8797 - val_loss: 0.2909 - val_mse:
0.2938 - val_rmse: 0.5420 - val_mae: 0.2909 - val_mape: 8.3928 - lr: 0.0010
Epoch 117/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2936 - mse: 0.2944
- rmse: 0.5426 - mae: 0.2936 - mape: 9.0658
Epoch 117: val_loss did not improve from 0.27188
318/318 [=====] - 0s 2ms/step - loss: 0.2942 - mse:
0.2947 - rmse: 0.5429 - mae: 0.2942 - mape: 9.1020 - val_loss: 0.2730 - val_mse:
0.2608 - val_rmse: 0.5107 - val_mae: 0.2730 - val_mape: 8.6610 - lr: 0.0010
Epoch 118/2000
270/318 [=====>...] - ETA: 0s - loss: 0.2882 - mse: 0.2802
- rmse: 0.5293 - mae: 0.2882 - mape: 9.0022
Epoch 118: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2879 - mse:
0.2781 - rmse: 0.5274 - mae: 0.2879 - mape: 8.9938 - val_loss: 0.2887 - val_mse:
0.2852 - val_rmse: 0.5340 - val_mae: 0.2887 - val_mape: 8.4197 - lr: 0.0010
Epoch 119/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2868 - mse: 0.2776
- rmse: 0.5269 - mae: 0.2868 - mape: 8.8863
Epoch 119: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2870 - mse:

0.2784 - rmse: 0.5277 - mae: 0.2870 - mape: 8.9068 - val_loss: 0.2822 - val_mse: 0.2620 - val_rmse: 0.5118 - val_mae: 0.2822 - val_mape: 9.1921 - lr: 0.0010
Epoch 120/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2915 - mse: 0.2897
- rmse: 0.5383 - mae: 0.2915 - mape: 9.0305
Epoch 120: val_loss did not improve from 0.27188
318/318 [=====] - 1s 2ms/step - loss: 0.2923 - mse: 0.2936 - rmse: 0.5419 - mae: 0.2923 - mape: 9.0624 - val_loss: 0.2726 - val_mse: 0.2586 - val_rmse: 0.5085 - val_mae: 0.2726 - val_mape: 8.7561 - lr: 0.0010
Epoch 121/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2901 - mse: 0.2823
- rmse: 0.5313 - mae: 0.2901 - mape: 9.0379
Epoch 121: val_loss did not improve from 0.27188
318/318 [=====] - 0s 1ms/step - loss: 0.2910 - mse: 0.2859 - rmse: 0.5347 - mae: 0.2910 - mape: 9.0704 - val_loss: 0.2874 - val_mse: 0.2921 - val_rmse: 0.5404 - val_mae: 0.2874 - val_mape: 9.3633 - lr: 0.0010
Epoch 122/2000
273/318 [=====>...] - ETA: 0s - loss: 0.2864 - mse: 0.2840
- rmse: 0.5329 - mae: 0.2864 - mape: 8.9272
Epoch 122: val_loss improved from 0.27188 to 0.27155, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2864 - mse: 0.2814 - rmse: 0.5305 - mae: 0.2864 - mape: 8.9431 - val_loss: 0.2715 - val_mse: 0.2483 - val_rmse: 0.4983 - val_mae: 0.2715 - val_mape: 8.3926 - lr: 0.0010
Epoch 123/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2899 - mse: 0.2835
- rmse: 0.5325 - mae: 0.2899 - mape: 9.0144
Epoch 123: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2895 - mse: 0.2834 - rmse: 0.5323 - mae: 0.2895 - mape: 8.9855 - val_loss: 0.2761 - val_mse: 0.2662 - val_rmse: 0.5159 - val_mae: 0.2761 - val_mape: 8.8431 - lr: 0.0010
Epoch 124/2000
294/318 [=====>...] - ETA: 0s - loss: 0.2883 - mse: 0.2796
- rmse: 0.5288 - mae: 0.2883 - mape: 8.8912
Epoch 124: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2876 - mse: 0.2772 - rmse: 0.5265 - mae: 0.2876 - mape: 8.8912 - val_loss: 0.2975 - val_mse: 0.2902 - val_rmse: 0.5387 - val_mae: 0.2975 - val_mape: 9.8143 - lr: 0.0010
Epoch 125/2000
273/318 [=====>...] - ETA: 0s - loss: 0.2863 - mse: 0.2784
- rmse: 0.5276 - mae: 0.2863 - mape: 8.9053
Epoch 125: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2878 - mse: 0.2790 - rmse: 0.5282 - mae: 0.2878 - mape: 8.9526 - val_loss: 0.2731 - val_mse: 0.2441 - val_rmse: 0.4941 - val_mae: 0.2731 - val_mape: 8.5857 - lr: 0.0010
Epoch 126/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2838 - mse: 0.2721
- rmse: 0.5216 - mae: 0.2838 - mape: 8.8300

Epoch 126: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2855 - mse: 0.2772 - rmse: 0.5265 - mae: 0.2855 - mape: 8.8955 - val_loss: 0.2892 - val_mse: 0.2648 - val_rmse: 0.5146 - val_mae: 0.2892 - val_mape: 9.2972 - lr: 0.0010
Epoch 127/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2840 - mse: 0.2728 - rmse: 0.5223 - mae: 0.2840 - mape: 8.7781
Epoch 127: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2828 - mse: 0.2708 - rmse: 0.5204 - mae: 0.2828 - mape: 8.7539 - val_loss: 0.3015 - val_mse: 0.3275 - val_rmse: 0.5723 - val_mae: 0.3015 - val_mape: 9.9890 - lr: 0.0010
Epoch 128/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2848 - mse: 0.2713 - rmse: 0.5209 - mae: 0.2848 - mape: 8.8546
Epoch 128: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2849 - mse: 0.2719 - rmse: 0.5215 - mae: 0.2849 - mape: 8.8591 - val_loss: 0.2730 - val_mse: 0.2460 - val_rmse: 0.4960 - val_mae: 0.2730 - val_mape: 8.4398 - lr: 0.0010
Epoch 129/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2870 - mse: 0.2833 - rmse: 0.5323 - mae: 0.2870 - mape: 8.9324
Epoch 129: val_loss did not improve from 0.27155
318/318 [=====] - 0s 2ms/step - loss: 0.2866 - mse: 0.2825 - rmse: 0.5315 - mae: 0.2866 - mape: 8.9232 - val_loss: 0.3344 - val_mse: 0.4197 - val_rmse: 0.6478 - val_mae: 0.3344 - val_mape: 9.1904 - lr: 0.0010
Epoch 130/2000
292/318 [=====>...] - ETA: 0s - loss: 0.3175 - mse: 0.3584 - rmse: 0.5986 - mae: 0.3175 - mape: 9.7924
Epoch 130: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.3158 - mse: 0.3517 - rmse: 0.5930 - mae: 0.3158 - mape: 9.7268 - val_loss: 0.2829 - val_mse: 0.2602 - val_rmse: 0.5101 - val_mae: 0.2829 - val_mape: 8.5657 - lr: 0.0010
Epoch 131/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2915 - mse: 0.2806 - rmse: 0.5297 - mae: 0.2915 - mape: 9.0382
Epoch 131: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2900 - mse: 0.2782 - rmse: 0.5274 - mae: 0.2900 - mape: 8.9980 - val_loss: 0.2848 - val_mse: 0.2679 - val_rmse: 0.5176 - val_mae: 0.2848 - val_mape: 8.4231 - lr: 0.0010
Epoch 132/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2883 - mse: 0.2734 - rmse: 0.5228 - mae: 0.2883 - mape: 8.9020
Epoch 132: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2873 - mse: 0.2715 - rmse: 0.5210 - mae: 0.2873 - mape: 8.8713 - val_loss: 0.2810 - val_mse: 0.2573 - val_rmse: 0.5072 - val_mae: 0.2810 - val_mape: 8.9525 - lr: 0.0010
Epoch 133/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2918 - mse: 0.2827

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- rmse: 0.5317 - mae: 0.2918 - mape: 9.0522
Epoch 133: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2911 - mse:
0.2813 - rmse: 0.5303 - mae: 0.2911 - mape: 9.0241 - val_loss: 0.2755 - val_mse:
0.2533 - val_rmse: 0.5033 - val_mae: 0.2755 - val_mape: 8.4581 - lr: 0.0010
Epoch 134/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2855 - mse: 0.2742
- rmse: 0.5236 - mae: 0.2855 - mape: 8.8601
Epoch 134: val_loss did not improve from 0.27155
318/318 [=====] - 0s 2ms/step - loss: 0.2845 - mse:
0.2732 - rmse: 0.5227 - mae: 0.2845 - mape: 8.8352 - val_loss: 0.2782 - val_mse:
0.2640 - val_rmse: 0.5138 - val_mae: 0.2782 - val_mape: 8.1392 - lr: 0.0010
Epoch 135/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2874 - mse: 0.2734
- rmse: 0.5229 - mae: 0.2874 - mape: 8.9010
Epoch 135: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2899 - mse:
0.2820 - rmse: 0.5311 - mae: 0.2899 - mape: 8.9613 - val_loss: 0.2937 - val_mse:
0.2946 - val_rmse: 0.5428 - val_mae: 0.2937 - val_mape: 9.7139 - lr: 0.0010
Epoch 136/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2836 - mse: 0.2752
- rmse: 0.5246 - mae: 0.2836 - mape: 8.7840
Epoch 136: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2870 - mse:
0.2799 - rmse: 0.5291 - mae: 0.2870 - mape: 8.8676 - val_loss: 0.2819 - val_mse:
0.2628 - val_rmse: 0.5126 - val_mae: 0.2819 - val_mape: 8.3996 - lr: 0.0010
Epoch 137/2000
266/318 [=====>...] - ETA: 0s - loss: 0.2892 - mse: 0.2834
- rmse: 0.5323 - mae: 0.2892 - mape: 8.8965
Epoch 137: val_loss did not improve from 0.27155
318/318 [=====] - 1s 2ms/step - loss: 0.2907 - mse:
0.2850 - rmse: 0.5339 - mae: 0.2907 - mape: 8.9285 - val_loss: 0.2855 - val_mse:
0.2560 - val_rmse: 0.5059 - val_mae: 0.2855 - val_mape: 8.8532 - lr: 0.0010
Epoch 138/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2840 - mse: 0.2726
- rmse: 0.5221 - mae: 0.2840 - mape: 8.7979
Epoch 138: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2831 - mse:
0.2702 - rmse: 0.5198 - mae: 0.2831 - mape: 8.7703 - val_loss: 0.2816 - val_mse:
0.2642 - val_rmse: 0.5140 - val_mae: 0.2816 - val_mape: 8.3970 - lr: 0.0010
Epoch 139/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2873 - mse: 0.2790
- rmse: 0.5282 - mae: 0.2873 - mape: 8.9136
Epoch 139: val_loss did not improve from 0.27155
318/318 [=====] - 0s 2ms/step - loss: 0.2874 - mse:
0.2790 - rmse: 0.5282 - mae: 0.2874 - mape: 8.9144 - val_loss: 0.2833 - val_mse:
0.2645 - val_rmse: 0.5143 - val_mae: 0.2833 - val_mape: 9.2012 - lr: 0.0010
Epoch 140/2000

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306/318 [=====>..] - ETA: 0s - loss: 0.2863 - mse: 0.2772
- rmse: 0.5265 - mae: 0.2863 - mape: 8.8302
Epoch 140: val_loss did not improve from 0.27155
318/318 [=====] - 0s 2ms/step - loss: 0.2859 - mse:
0.2773 - rmse: 0.5266 - mae: 0.2859 - mape: 8.8264 - val_loss: 0.2902 - val_mse:
0.3196 - val_rmse: 0.5653 - val_mae: 0.2902 - val_mape: 8.1116 - lr: 0.0010
Epoch 141/2000
270/318 [=====>...] - ETA: 0s - loss: 0.2837 - mse: 0.2716
- rmse: 0.5212 - mae: 0.2837 - mape: 8.7766
Epoch 141: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2827 - mse:
0.2731 - rmse: 0.5226 - mae: 0.2827 - mape: 8.7378 - val_loss: 0.2735 - val_mse:
0.2452 - val_rmse: 0.4952 - val_mae: 0.2735 - val_mape: 8.3121 - lr: 0.0010
Epoch 142/2000
271/318 [=====>...] - ETA: 0s - loss: 0.2844 - mse: 0.2750
- rmse: 0.5244 - mae: 0.2844 - mape: 8.8178
Epoch 142: val_loss did not improve from 0.27155
318/318 [=====] - 0s 2ms/step - loss: 0.2848 - mse:
0.2760 - rmse: 0.5254 - mae: 0.2848 - mape: 8.8335 - val_loss: 0.2839 - val_mse:
0.2673 - val_rmse: 0.5170 - val_mae: 0.2839 - val_mape: 9.2010 - lr: 0.0010
Epoch 143/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2864 - mse: 0.2795
- rmse: 0.5287 - mae: 0.2864 - mape: 8.8396
Epoch 143: val_loss did not improve from 0.27155
318/318 [=====] - 0s 2ms/step - loss: 0.2857 - mse:
0.2784 - rmse: 0.5277 - mae: 0.2857 - mape: 8.8201 - val_loss: 0.2725 - val_mse:
0.2459 - val_rmse: 0.4958 - val_mae: 0.2725 - val_mape: 8.4861 - lr: 0.0010
Epoch 144/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2760 - mse: 0.2602
- rmse: 0.5101 - mae: 0.2760 - mape: 8.5736
Epoch 144: val_loss did not improve from 0.27155
318/318 [=====] - 0s 1ms/step - loss: 0.2754 - mse:
0.2591 - rmse: 0.5091 - mae: 0.2754 - mape: 8.5431 - val_loss: 0.2756 - val_mse:
0.2527 - val_rmse: 0.5027 - val_mae: 0.2756 - val_mape: 8.6159 - lr: 0.0010
Epoch 145/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2840 - mse: 0.2773
- rmse: 0.5266 - mae: 0.2840 - mape: 8.7796
Epoch 145: val_loss did not improve from 0.27155
318/318 [=====] - 0s 2ms/step - loss: 0.2846 - mse:
0.2792 - rmse: 0.5284 - mae: 0.2846 - mape: 8.8114 - val_loss: 0.2792 - val_mse:
0.2563 - val_rmse: 0.5063 - val_mae: 0.2792 - val_mape: 8.5911 - lr: 0.0010
Epoch 146/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2850 - mse: 0.2786
- rmse: 0.5278 - mae: 0.2850 - mape: 8.8708
Epoch 146: val_loss improved from 0.27155 to 0.27041, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2843 - mse:
0.2765 - rmse: 0.5259 - mae: 0.2843 - mape: 8.8354 - val_loss: 0.2704 - val_mse:

0.2467 - val_rmse: 0.4967 - val_mae: 0.2704 - val_mape: 8.4994 - lr: 0.0010
Epoch 147/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2834 - mse: 0.2722
- rmse: 0.5217 - mae: 0.2834 - mape: 8.7731
Epoch 147: val_loss improved from 0.27041 to 0.26801, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2820 - mse:
0.2692 - rmse: 0.5189 - mae: 0.2820 - mape: 8.7159 - val_loss: 0.2680 - val_mse:
0.2489 - val_rmse: 0.4989 - val_mae: 0.2680 - val_mape: 8.2129 - lr: 0.0010
Epoch 148/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2752 - mse: 0.2616
- rmse: 0.5114 - mae: 0.2752 - mape: 8.5030
Epoch 148: val_loss did not improve from 0.26801
318/318 [=====] - 0s 1ms/step - loss: 0.2769 - mse:
0.2635 - rmse: 0.5134 - mae: 0.2769 - mape: 8.5722 - val_loss: 0.2701 - val_mse:
0.2478 - val_rmse: 0.4978 - val_mae: 0.2701 - val_mape: 8.1350 - lr: 0.0010
Epoch 149/2000
289/318 [=====>...] - ETA: 0s - loss: 0.2817 - mse: 0.2681
- rmse: 0.5178 - mae: 0.2817 - mape: 8.7195
Epoch 149: val_loss did not improve from 0.26801
318/318 [=====] - 0s 1ms/step - loss: 0.2819 - mse:
0.2691 - rmse: 0.5188 - mae: 0.2819 - mape: 8.7242 - val_loss: 0.2759 - val_mse:
0.2605 - val_rmse: 0.5104 - val_mae: 0.2759 - val_mape: 8.8298 - lr: 0.0010
Epoch 150/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2771 - mse: 0.2615
- rmse: 0.5114 - mae: 0.2771 - mape: 8.6013
Epoch 150: val_loss did not improve from 0.26801
318/318 [=====] - 0s 1ms/step - loss: 0.2770 - mse:
0.2620 - rmse: 0.5119 - mae: 0.2770 - mape: 8.5929 - val_loss: 0.3085 - val_mse:
0.3223 - val_rmse: 0.5677 - val_mae: 0.3085 - val_mape: 8.7778 - lr: 0.0010
Epoch 151/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2869 - mse: 0.2841
- rmse: 0.5330 - mae: 0.2869 - mape: 8.8688
Epoch 151: val_loss did not improve from 0.26801
318/318 [=====] - 0s 1ms/step - loss: 0.2870 - mse:
0.2851 - rmse: 0.5340 - mae: 0.2870 - mape: 8.8774 - val_loss: 0.2729 - val_mse:
0.2565 - val_rmse: 0.5064 - val_mae: 0.2729 - val_mape: 8.3581 - lr: 0.0010
Epoch 152/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2772 - mse: 0.2647
- rmse: 0.5145 - mae: 0.2772 - mape: 8.6035
Epoch 152: val_loss did not improve from 0.26801
318/318 [=====] - 0s 1ms/step - loss: 0.2772 - mse:
0.2644 - rmse: 0.5142 - mae: 0.2772 - mape: 8.5952 - val_loss: 0.2748 - val_mse:
0.2654 - val_rmse: 0.5152 - val_mae: 0.2748 - val_mape: 8.9160 - lr: 0.0010
Epoch 153/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2805 - mse: 0.2668
- rmse: 0.5165 - mae: 0.2805 - mape: 8.6518
Epoch 153: val_loss improved from 0.26801 to 0.26647, saving model to

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model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2805 - mse:
0.2672 - rmse: 0.5170 - mae: 0.2805 - mape: 8.6457 - val_loss: 0.2665 - val_mse:
0.2447 - val_rmse: 0.4946 - val_mae: 0.2665 - val_mape: 8.2311 - lr: 0.0010
Epoch 154/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2782 - mse: 0.2638
- rmse: 0.5137 - mae: 0.2782 - mape: 8.5705
Epoch 154: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2767 - mse:
0.2622 - rmse: 0.5120 - mae: 0.2767 - mape: 8.5524 - val_loss: 0.2711 - val_mse:
0.2589 - val_rmse: 0.5089 - val_mae: 0.2711 - val_mape: 8.7362 - lr: 0.0010
Epoch 155/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2718 - mse: 0.2580
- rmse: 0.5080 - mae: 0.2718 - mape: 8.4541
Epoch 155: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2736 - mse:
0.2637 - rmse: 0.5135 - mae: 0.2736 - mape: 8.4851 - val_loss: 0.3929 - val_mse:
0.7050 - val_rmse: 0.8397 - val_mae: 0.3929 - val_mape: 10.2932 - lr: 0.0010
Epoch 156/2000
267/318 [=====>...] - ETA: 0s - loss: 0.3309 - mse: 0.4421
- rmse: 0.6649 - mae: 0.3309 - mape: 9.7251
Epoch 156: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.3376 - mse:
0.4620 - rmse: 0.6797 - mae: 0.3376 - mape: 9.8376 - val_loss: 0.3735 - val_mse:
0.5709 - val_rmse: 0.7556 - val_mae: 0.3735 - val_mape: 10.6038 - lr: 0.0010
Epoch 157/2000
266/318 [=====>...] - ETA: 0s - loss: 0.3588 - mse: 0.5118
- rmse: 0.7154 - mae: 0.3588 - mape: 10.3159
Epoch 157: val_loss did not improve from 0.26647
318/318 [=====] - 0s 2ms/step - loss: 0.3540 - mse:
0.4893 - rmse: 0.6995 - mae: 0.3540 - mape: 10.2530 - val_loss: 0.3115 -
val_mse: 0.3342 - val_rmse: 0.5781 - val_mae: 0.3115 - val_mape: 9.4463 - lr:
0.0010
Epoch 158/2000
317/318 [=====>.] - ETA: 0s - loss: 0.3142 - mse: 0.3222
- rmse: 0.5676 - mae: 0.3142 - mape: 9.6861
Epoch 158: val_loss did not improve from 0.26647
318/318 [=====] - 1s 2ms/step - loss: 0.3141 - mse:
0.3220 - rmse: 0.5675 - mae: 0.3141 - mape: 9.6849 - val_loss: 0.3672 - val_mse:
0.3890 - val_rmse: 0.6237 - val_mae: 0.3672 - val_mape: 11.3592 - lr: 0.0010
Epoch 159/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2891 - mse: 0.2725
- rmse: 0.5220 - mae: 0.2891 - mape: 8.9534
Epoch 159: val_loss did not improve from 0.26647
318/318 [=====] - 1s 2ms/step - loss: 0.2901 - mse:
0.2743 - rmse: 0.5237 - mae: 0.2901 - mape: 8.9750 - val_loss: 0.3532 - val_mse:
0.3912 - val_rmse: 0.6255 - val_mae: 0.3532 - val_mape: 11.2929 - lr: 0.0010
Epoch 160/2000

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274/318 [=====>...] - ETA: 0s - loss: 0.2829 - mse: 0.2661
- rmse: 0.5158 - mae: 0.2829 - mape: 8.7778
Epoch 160: val_loss did not improve from 0.26647
318/318 [=====] - 0s 2ms/step - loss: 0.2858 - mse:
0.2731 - rmse: 0.5226 - mae: 0.2858 - mape: 8.8809 - val_loss: 0.3196 - val_mse:
0.3442 - val_rmse: 0.5867 - val_mae: 0.3196 - val_mape: 9.3205 - lr: 0.0010
Epoch 161/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2863 - mse: 0.2747
- rmse: 0.5242 - mae: 0.2863 - mape: 8.8904
Epoch 161: val_loss did not improve from 0.26647
318/318 [=====] - 0s 2ms/step - loss: 0.2847 - mse:
0.2725 - rmse: 0.5220 - mae: 0.2847 - mape: 8.8433 - val_loss: 0.2686 - val_mse:
0.2595 - val_rmse: 0.5094 - val_mae: 0.2686 - val_mape: 8.4511 - lr: 0.0010
Epoch 162/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2827 - mse: 0.2683
- rmse: 0.5180 - mae: 0.2827 - mape: 8.7656
Epoch 162: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2816 - mse:
0.2670 - rmse: 0.5167 - mae: 0.2816 - mape: 8.7415 - val_loss: 0.2667 - val_mse:
0.2483 - val_rmse: 0.4983 - val_mae: 0.2667 - val_mape: 8.3736 - lr: 0.0010
Epoch 163/2000
263/318 [=====>...] - ETA: 0s - loss: 0.2923 - mse: 0.2931
- rmse: 0.5414 - mae: 0.2923 - mape: 9.1272
Epoch 163: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2938 - mse:
0.2996 - rmse: 0.5474 - mae: 0.2938 - mape: 9.1330 - val_loss: 0.2831 - val_mse:
0.2878 - val_rmse: 0.5365 - val_mae: 0.2831 - val_mape: 9.2769 - lr: 0.0010
Epoch 164/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2903 - mse: 0.2898
- rmse: 0.5383 - mae: 0.2903 - mape: 8.9780
Epoch 164: val_loss did not improve from 0.26647
318/318 [=====] - 1s 2ms/step - loss: 0.2888 - mse:
0.2873 - rmse: 0.5360 - mae: 0.2888 - mape: 8.9264 - val_loss: 0.2702 - val_mse:
0.2569 - val_rmse: 0.5069 - val_mae: 0.2702 - val_mape: 8.3558 - lr: 0.0010
Epoch 165/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2868 - mse: 0.2785
- rmse: 0.5277 - mae: 0.2868 - mape: 8.9028
Epoch 165: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2864 - mse:
0.2771 - rmse: 0.5264 - mae: 0.2864 - mape: 8.8805 - val_loss: 0.2754 - val_mse:
0.2598 - val_rmse: 0.5097 - val_mae: 0.2754 - val_mape: 8.4854 - lr: 0.0010
Epoch 166/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2808 - mse: 0.2762
- rmse: 0.5256 - mae: 0.2808 - mape: 8.7326
Epoch 166: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2807 - mse:
0.2753 - rmse: 0.5247 - mae: 0.2807 - mape: 8.7070 - val_loss: 0.2786 - val_mse:
0.2587 - val_rmse: 0.5086 - val_mae: 0.2786 - val_mape: 8.3904 - lr: 0.0010

Epoch 167/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2815 - mse: 0.2758
- rmse: 0.5251 - mae: 0.2815 - mape: 8.7747
Epoch 167: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2812 - mse:
0.2741 - rmse: 0.5236 - mae: 0.2812 - mape: 8.7353 - val_loss: 0.2742 - val_mse:
0.2599 - val_rmse: 0.5098 - val_mae: 0.2742 - val_mape: 8.3858 - lr: 0.0010
Epoch 168/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2810 - mse: 0.2737
- rmse: 0.5231 - mae: 0.2810 - mape: 8.7065
Epoch 168: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2826 - mse:
0.2746 - rmse: 0.5240 - mae: 0.2826 - mape: 8.7483 - val_loss: 0.3035 - val_mse:
0.3161 - val_rmse: 0.5622 - val_mae: 0.3035 - val_mape: 10.1616 - lr: 0.0010
Epoch 169/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2907 - mse: 0.2930
- rmse: 0.5413 - mae: 0.2907 - mape: 9.0305
Epoch 169: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2903 - mse:
0.2924 - rmse: 0.5407 - mae: 0.2903 - mape: 9.0272 - val_loss: 0.2864 - val_mse:
0.2765 - val_rmse: 0.5258 - val_mae: 0.2864 - val_mape: 8.7132 - lr: 0.0010
Epoch 170/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2810 - mse: 0.2736
- rmse: 0.5230 - mae: 0.2810 - mape: 8.6541
Epoch 170: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2787 - mse:
0.2697 - rmse: 0.5194 - mae: 0.2787 - mape: 8.6114 - val_loss: 0.2707 - val_mse:
0.2676 - val_rmse: 0.5173 - val_mae: 0.2707 - val_mape: 8.6831 - lr: 0.0010
Epoch 171/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2832 - mse: 0.2823
- rmse: 0.5314 - mae: 0.2832 - mape: 8.7652
Epoch 171: val_loss did not improve from 0.26647
318/318 [=====] - 1s 2ms/step - loss: 0.2845 - mse:
0.2865 - rmse: 0.5352 - mae: 0.2845 - mape: 8.8130 - val_loss: 0.2727 - val_mse:
0.2522 - val_rmse: 0.5022 - val_mae: 0.2727 - val_mape: 8.3892 - lr: 0.0010
Epoch 172/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2765 - mse: 0.2675
- rmse: 0.5172 - mae: 0.2765 - mape: 8.5732
Epoch 172: val_loss did not improve from 0.26647
318/318 [=====] - 0s 1ms/step - loss: 0.2773 - mse:
0.2690 - rmse: 0.5186 - mae: 0.2773 - mape: 8.5898 - val_loss: 0.2831 - val_mse:
0.2881 - val_rmse: 0.5368 - val_mae: 0.2831 - val_mape: 8.1185 - lr: 0.0010
Epoch 173/2000
289/318 [=====>...] - ETA: 0s - loss: 0.2782 - mse: 0.2715
- rmse: 0.5211 - mae: 0.2782 - mape: 8.5955
Epoch 173: val_loss improved from 0.26647 to 0.26526, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2769 - mse:

0.2679 - rmse: 0.5176 - mae: 0.2769 - mape: 8.5586 - val_loss: 0.2653 - val_mse: 0.2425 - val_rmse: 0.4925 - val_mae: 0.2653 - val_mape: 8.1982 - lr: 0.0010
Epoch 174/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2777 - mse: 0.2683
- rmse: 0.5180 - mae: 0.2777 - mape: 8.5672
Epoch 174: val_loss did not improve from 0.26526
318/318 [=====] - 0s 1ms/step - loss: 0.2767 - mse: 0.2657 - rmse: 0.5155 - mae: 0.2767 - mape: 8.5479 - val_loss: 0.2661 - val_mse: 0.2517 - val_rmse: 0.5017 - val_mae: 0.2661 - val_mape: 8.4832 - lr: 0.0010
Epoch 175/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2820 - mse: 0.2747
- rmse: 0.5242 - mae: 0.2820 - mape: 8.7668
Epoch 175: val_loss did not improve from 0.26526
318/318 [=====] - 0s 1ms/step - loss: 0.2822 - mse: 0.2753 - rmse: 0.5246 - mae: 0.2822 - mape: 8.7640 - val_loss: 0.2711 - val_mse: 0.2528 - val_rmse: 0.5028 - val_mae: 0.2711 - val_mape: 8.5875 - lr: 0.0010
Epoch 176/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2823 - mse: 0.2767
- rmse: 0.5261 - mae: 0.2823 - mape: 8.6867
Epoch 176: val_loss did not improve from 0.26526
318/318 [=====] - 1s 2ms/step - loss: 0.2817 - mse: 0.2762 - rmse: 0.5256 - mae: 0.2817 - mape: 8.6660 - val_loss: 0.2691 - val_mse: 0.2478 - val_rmse: 0.4978 - val_mae: 0.2691 - val_mape: 8.2995 - lr: 0.0010
Epoch 177/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2765 - mse: 0.2675
- rmse: 0.5172 - mae: 0.2765 - mape: 8.5370
Epoch 177: val_loss improved from 0.26526 to 0.26469, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2763 - mse: 0.2673 - rmse: 0.5170 - mae: 0.2763 - mape: 8.5281 - val_loss: 0.2647 - val_mse: 0.2431 - val_rmse: 0.4931 - val_mae: 0.2647 - val_mape: 8.0254 - lr: 0.0010
Epoch 178/2000
268/318 [=====>...] - ETA: 0s - loss: 0.2792 - mse: 0.2783
- rmse: 0.5275 - mae: 0.2792 - mape: 8.5835
Epoch 178: val_loss did not improve from 0.26469
318/318 [=====] - 0s 1ms/step - loss: 0.2769 - mse: 0.2721 - rmse: 0.5217 - mae: 0.2769 - mape: 8.5274 - val_loss: 0.2888 - val_mse: 0.2858 - val_rmse: 0.5346 - val_mae: 0.2888 - val_mape: 8.6738 - lr: 0.0010
Epoch 179/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2851 - mse: 0.2849
- rmse: 0.5338 - mae: 0.2851 - mape: 8.7744
Epoch 179: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2848 - mse: 0.2844 - rmse: 0.5333 - mae: 0.2848 - mape: 8.7648 - val_loss: 0.2664 - val_mse: 0.2540 - val_rmse: 0.5039 - val_mae: 0.2664 - val_mape: 8.1457 - lr: 0.0010
Epoch 180/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2766 - mse: 0.2667
- rmse: 0.5164 - mae: 0.2766 - mape: 8.5442

Epoch 180: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2763 - mse: 0.2659 - rmse: 0.5157 - mae: 0.2763 - mape: 8.5374 - val_loss: 0.2870 - val_mse: 0.2833 - val_rmse: 0.5323 - val_mae: 0.2870 - val_mape: 8.5942 - lr: 0.0010
Epoch 181/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2739 - mse: 0.2615 - rmse: 0.5113 - mae: 0.2739 - mape: 8.5224
Epoch 181: val_loss did not improve from 0.26469
318/318 [=====] - 1s 2ms/step - loss: 0.2737 - mse: 0.2603 - rmse: 0.5102 - mae: 0.2737 - mape: 8.5376 - val_loss: 0.2735 - val_mse: 0.2592 - val_rmse: 0.5091 - val_mae: 0.2735 - val_mape: 8.1616 - lr: 0.0010
Epoch 182/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2775 - mse: 0.2678 - rmse: 0.5175 - mae: 0.2775 - mape: 8.5717
Epoch 182: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2777 - mse: 0.2684 - rmse: 0.5181 - mae: 0.2777 - mape: 8.5807 - val_loss: 0.2657 - val_mse: 0.2606 - val_rmse: 0.5105 - val_mae: 0.2657 - val_mape: 8.2363 - lr: 0.0010
Epoch 183/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2783 - mse: 0.2712 - rmse: 0.5208 - mae: 0.2783 - mape: 8.6313
Epoch 183: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2783 - mse: 0.2706 - rmse: 0.5202 - mae: 0.2783 - mape: 8.6324 - val_loss: 0.2738 - val_mse: 0.2443 - val_rmse: 0.4943 - val_mae: 0.2738 - val_mape: 8.6046 - lr: 0.0010
Epoch 184/2000
272/318 [=====>...] - ETA: 0s - loss: 0.2808 - mse: 0.2718 - rmse: 0.5213 - mae: 0.2808 - mape: 8.7247
Epoch 184: val_loss did not improve from 0.26469
318/318 [=====] - 0s 1ms/step - loss: 0.2793 - mse: 0.2681 - rmse: 0.5178 - mae: 0.2793 - mape: 8.6689 - val_loss: 0.2686 - val_mse: 0.2492 - val_rmse: 0.4992 - val_mae: 0.2686 - val_mape: 8.4460 - lr: 0.0010
Epoch 185/2000
315/318 [=====>.] - ETA: 0s - loss: 0.3002 - mse: 0.3041 - rmse: 0.5514 - mae: 0.3002 - mape: 9.1972
Epoch 185: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.3002 - mse: 0.3038 - rmse: 0.5512 - mae: 0.3002 - mape: 9.2094 - val_loss: 0.3037 - val_mse: 0.3035 - val_rmse: 0.5510 - val_mae: 0.3037 - val_mape: 8.9051 - lr: 0.0010
Epoch 186/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2925 - mse: 0.2812 - rmse: 0.5303 - mae: 0.2925 - mape: 8.8521
Epoch 186: val_loss did not improve from 0.26469
318/318 [=====] - 1s 2ms/step - loss: 0.2918 - mse: 0.2787 - rmse: 0.5280 - mae: 0.2918 - mape: 8.8495 - val_loss: 0.2988 - val_mse: 0.2811 - val_rmse: 0.5302 - val_mae: 0.2988 - val_mape: 9.6500 - lr: 0.0010
Epoch 187/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2809 - mse: 0.2620

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- rmse: 0.5118 - mae: 0.2809 - mape: 8.5205
Epoch 187: val_loss did not improve from 0.26469
318/318 [=====] - 0s 1ms/step - loss: 0.2805 - mse:
0.2623 - rmse: 0.5121 - mae: 0.2805 - mape: 8.5081 - val_loss: 0.2692 - val_mse:
0.2542 - val_rmse: 0.5042 - val_mae: 0.2692 - val_mape: 8.0228 - lr: 0.0010
Epoch 188/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2793 - mse: 0.2619
- rmse: 0.5117 - mae: 0.2793 - mape: 8.4800
Epoch 188: val_loss did not improve from 0.26469
318/318 [=====] - 0s 1ms/step - loss: 0.2796 - mse:
0.2636 - rmse: 0.5134 - mae: 0.2796 - mape: 8.4877 - val_loss: 0.2880 - val_mse:
0.2680 - val_rmse: 0.5177 - val_mae: 0.2880 - val_mape: 9.2524 - lr: 0.0010
Epoch 189/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2842 - mse: 0.2759
- rmse: 0.5253 - mae: 0.2842 - mape: 8.6635
Epoch 189: val_loss did not improve from 0.26469
318/318 [=====] - 0s 1ms/step - loss: 0.2862 - mse:
0.2769 - rmse: 0.5262 - mae: 0.2862 - mape: 8.6909 - val_loss: 0.2766 - val_mse:
0.2489 - val_rmse: 0.4989 - val_mae: 0.2766 - val_mape: 8.4794 - lr: 0.0010
Epoch 190/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2862 - mse: 0.2761
- rmse: 0.5255 - mae: 0.2862 - mape: 8.6659
Epoch 190: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2860 - mse:
0.2757 - rmse: 0.5251 - mae: 0.2860 - mape: 8.6561 - val_loss: 0.3021 - val_mse:
0.2999 - val_rmse: 0.5477 - val_mae: 0.3021 - val_mape: 9.7946 - lr: 0.0010
Epoch 191/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2802 - mse: 0.2694
- rmse: 0.5191 - mae: 0.2802 - mape: 8.4960
Epoch 191: val_loss did not improve from 0.26469
318/318 [=====] - 1s 2ms/step - loss: 0.2803 - mse:
0.2695 - rmse: 0.5192 - mae: 0.2803 - mape: 8.4883 - val_loss: 0.3028 - val_mse:
0.2981 - val_rmse: 0.5459 - val_mae: 0.3028 - val_mape: 9.9264 - lr: 0.0010
Epoch 192/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2802 - mse: 0.2672
- rmse: 0.5169 - mae: 0.2802 - mape: 8.4912
Epoch 192: val_loss did not improve from 0.26469
318/318 [=====] - 0s 1ms/step - loss: 0.2800 - mse:
0.2677 - rmse: 0.5174 - mae: 0.2800 - mape: 8.4910 - val_loss: 0.3119 - val_mse:
0.3182 - val_rmse: 0.5641 - val_mae: 0.3119 - val_mape: 10.3813 - lr: 0.0010
Epoch 193/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2821 - mse: 0.2718
- rmse: 0.5214 - mae: 0.2821 - mape: 8.5726
Epoch 193: val_loss did not improve from 0.26469
318/318 [=====] - 0s 1ms/step - loss: 0.2823 - mse:
0.2710 - rmse: 0.5206 - mae: 0.2823 - mape: 8.5746 - val_loss: 0.2702 - val_mse:
0.2548 - val_rmse: 0.5048 - val_mae: 0.2702 - val_mape: 8.1976 - lr: 0.0010
Epoch 194/2000

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306/318 [=====>..] - ETA: 0s - loss: 0.2859 - mse: 0.2757
- rmse: 0.5251 - mae: 0.2859 - mape: 8.7269
Epoch 194: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2861 - mse:
0.2767 - rmse: 0.5260 - mae: 0.2861 - mape: 8.7276 - val_loss: 0.2737 - val_mse:
0.2494 - val_rmse: 0.4994 - val_mae: 0.2737 - val_mape: 8.2866 - lr: 0.0010
Epoch 195/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2792 - mse: 0.2625
- rmse: 0.5124 - mae: 0.2792 - mape: 8.4788
Epoch 195: val_loss did not improve from 0.26469
318/318 [=====] - 0s 1ms/step - loss: 0.2789 - mse:
0.2645 - rmse: 0.5143 - mae: 0.2789 - mape: 8.4731 - val_loss: 0.2699 - val_mse:
0.2480 - val_rmse: 0.4980 - val_mae: 0.2699 - val_mape: 8.3830 - lr: 0.0010
Epoch 196/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2763 - mse: 0.2562
- rmse: 0.5061 - mae: 0.2763 - mape: 8.4729
Epoch 196: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2778 - mse:
0.2616 - rmse: 0.5115 - mae: 0.2778 - mape: 8.5079 - val_loss: 0.3000 - val_mse:
0.3010 - val_rmse: 0.5486 - val_mae: 0.3000 - val_mape: 9.5695 - lr: 0.0010
Epoch 197/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2842 - mse: 0.2806
- rmse: 0.5297 - mae: 0.2842 - mape: 8.6909
Epoch 197: val_loss did not improve from 0.26469
318/318 [=====] - 0s 1ms/step - loss: 0.2837 - mse:
0.2804 - rmse: 0.5296 - mae: 0.2837 - mape: 8.6729 - val_loss: 0.2744 - val_mse:
0.2788 - val_rmse: 0.5280 - val_mae: 0.2744 - val_mape: 7.8932 - lr: 0.0010
Epoch 198/2000
316/318 [=====>..] - ETA: 0s - loss: 0.2765 - mse: 0.2665
- rmse: 0.5163 - mae: 0.2765 - mape: 8.4031
Epoch 198: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2766 - mse:
0.2667 - rmse: 0.5164 - mae: 0.2766 - mape: 8.4097 - val_loss: 0.2694 - val_mse:
0.2515 - val_rmse: 0.5015 - val_mae: 0.2694 - val_mape: 8.1419 - lr: 0.0010
Epoch 199/2000
315/318 [=====>..] - ETA: 0s - loss: 0.2805 - mse: 0.2727
- rmse: 0.5222 - mae: 0.2805 - mape: 8.5634
Epoch 199: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2803 - mse:
0.2723 - rmse: 0.5218 - mae: 0.2803 - mape: 8.5565 - val_loss: 0.3113 - val_mse:
0.3645 - val_rmse: 0.6037 - val_mae: 0.3113 - val_mape: 8.6159 - lr: 0.0010
Epoch 200/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2850 - mse: 0.2741
- rmse: 0.5235 - mae: 0.2850 - mape: 8.7204
Epoch 200: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2823 - mse:
0.2697 - rmse: 0.5193 - mae: 0.2823 - mape: 8.6357 - val_loss: 0.2745 - val_mse:
0.2533 - val_rmse: 0.5033 - val_mae: 0.2745 - val_mape: 8.4696 - lr: 0.0010

Epoch 201/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2779 - mse: 0.2651
- rmse: 0.5149 - mae: 0.2779 - mape: 8.5254
Epoch 201: val_loss did not improve from 0.26469
318/318 [=====] - 1s 2ms/step - loss: 0.2779 - mse:
0.2646 - rmse: 0.5144 - mae: 0.2779 - mape: 8.5220 - val_loss: 0.2702 - val_mse:
0.2440 - val_rmse: 0.4940 - val_mae: 0.2702 - val_mape: 8.3042 - lr: 0.0010
Epoch 202/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2806 - mse: 0.2700
- rmse: 0.5196 - mae: 0.2806 - mape: 8.6029
Epoch 202: val_loss did not improve from 0.26469
318/318 [=====] - 1s 2ms/step - loss: 0.2796 - mse:
0.2678 - rmse: 0.5175 - mae: 0.2796 - mape: 8.5724 - val_loss: 0.2745 - val_mse:
0.2525 - val_rmse: 0.5025 - val_mae: 0.2745 - val_mape: 8.6870 - lr: 0.0010
Epoch 203/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2760 - mse: 0.2664
- rmse: 0.5162 - mae: 0.2760 - mape: 8.4648
Epoch 203: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2761 - mse:
0.2662 - rmse: 0.5159 - mae: 0.2761 - mape: 8.4666 - val_loss: 0.2855 - val_mse:
0.2789 - val_rmse: 0.5281 - val_mae: 0.2855 - val_mape: 9.1856 - lr: 0.0010
Epoch 204/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2753 - mse: 0.2651
- rmse: 0.5148 - mae: 0.2753 - mape: 8.3964
Epoch 204: val_loss did not improve from 0.26469
318/318 [=====] - 0s 2ms/step - loss: 0.2759 - mse:
0.2660 - rmse: 0.5157 - mae: 0.2759 - mape: 8.4244 - val_loss: 0.2852 - val_mse:
0.2851 - val_rmse: 0.5339 - val_mae: 0.2852 - val_mape: 8.2528 - lr: 0.0010
Epoch 205/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2780 - mse: 0.2663
- rmse: 0.5160 - mae: 0.2780 - mape: 8.4450
Epoch 205: val_loss did not improve from 0.26469
318/318 [=====] - 1s 2ms/step - loss: 0.2773 - mse:
0.2644 - rmse: 0.5142 - mae: 0.2773 - mape: 8.4330 - val_loss: 0.2677 - val_mse:
0.2516 - val_rmse: 0.5016 - val_mae: 0.2677 - val_mape: 8.0385 - lr: 0.0010
Epoch 206/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2757 - mse: 0.2623
- rmse: 0.5122 - mae: 0.2757 - mape: 8.4598
Epoch 206: val_loss improved from 0.26469 to 0.26440, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2750 - mse:
0.2619 - rmse: 0.5117 - mae: 0.2750 - mape: 8.4456 - val_loss: 0.2644 - val_mse:
0.2456 - val_rmse: 0.4956 - val_mae: 0.2644 - val_mape: 8.0397 - lr: 0.0010
Epoch 207/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2842 - mse: 0.2771
- rmse: 0.5264 - mae: 0.2842 - mape: 8.7287
Epoch 207: val_loss did not improve from 0.26440
318/318 [=====] - 0s 1ms/step - loss: 0.2842 - mse:

0.2766 - rmse: 0.5260 - mae: 0.2842 - mape: 8.7097 - val_loss: 0.3216 - val_mse:
0.3870 - val_rmse: 0.6221 - val_mae: 0.3216 - val_mape: 8.8489 - lr: 0.0010
Epoch 208/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2759 - mse: 0.2636
- rmse: 0.5134 - mae: 0.2759 - mape: 8.4280
Epoch 208: val_loss did not improve from 0.26440
318/318 [=====] - 0s 1ms/step - loss: 0.2771 - mse:
0.2647 - rmse: 0.5145 - mae: 0.2771 - mape: 8.4713 - val_loss: 0.2903 - val_mse:
0.2839 - val_rmse: 0.5328 - val_mae: 0.2903 - val_mape: 9.4143 - lr: 0.0010
Epoch 209/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2818 - mse: 0.2729
- rmse: 0.5224 - mae: 0.2818 - mape: 8.6210
Epoch 209: val_loss did not improve from 0.26440
318/318 [=====] - 0s 1ms/step - loss: 0.2805 - mse:
0.2702 - rmse: 0.5198 - mae: 0.2805 - mape: 8.5926 - val_loss: 0.2679 - val_mse:
0.2583 - val_rmse: 0.5082 - val_mae: 0.2679 - val_mape: 8.4369 - lr: 0.0010
Epoch 210/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2765 - mse: 0.2658
- rmse: 0.5156 - mae: 0.2765 - mape: 8.4562
Epoch 210: val_loss did not improve from 0.26440
318/318 [=====] - 0s 2ms/step - loss: 0.2761 - mse:
0.2648 - rmse: 0.5146 - mae: 0.2761 - mape: 8.4549 - val_loss: 0.2711 - val_mse:
0.2452 - val_rmse: 0.4952 - val_mae: 0.2711 - val_mape: 8.3274 - lr: 0.0010
Epoch 211/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2740 - mse: 0.2586
- rmse: 0.5085 - mae: 0.2740 - mape: 8.4118
Epoch 211: val_loss did not improve from 0.26440
318/318 [=====] - 0s 1ms/step - loss: 0.2767 - mse:
0.2641 - rmse: 0.5139 - mae: 0.2767 - mape: 8.4712 - val_loss: 0.2694 - val_mse:
0.2527 - val_rmse: 0.5027 - val_mae: 0.2694 - val_mape: 8.0945 - lr: 0.0010
Epoch 212/2000
289/318 [=====>...] - ETA: 0s - loss: 0.2734 - mse: 0.2563
- rmse: 0.5063 - mae: 0.2734 - mape: 8.3928
Epoch 212: val_loss did not improve from 0.26440
318/318 [=====] - 0s 1ms/step - loss: 0.2733 - mse:
0.2574 - rmse: 0.5074 - mae: 0.2733 - mape: 8.3923 - val_loss: 0.2801 - val_mse:
0.2686 - val_rmse: 0.5183 - val_mae: 0.2801 - val_mape: 8.9924 - lr: 0.0010
Epoch 213/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2760 - mse: 0.2628
- rmse: 0.5127 - mae: 0.2760 - mape: 8.4848
Epoch 213: val_loss did not improve from 0.26440
318/318 [=====] - 1s 2ms/step - loss: 0.2753 - mse:
0.2618 - rmse: 0.5117 - mae: 0.2753 - mape: 8.4735 - val_loss: 0.2738 - val_mse:
0.2622 - val_rmse: 0.5121 - val_mae: 0.2738 - val_mape: 8.1771 - lr: 0.0010
Epoch 214/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2727 - mse: 0.2571
- rmse: 0.5070 - mae: 0.2727 - mape: 8.4451
Epoch 214: val_loss did not improve from 0.26440

318/318 [=====] - 0s 2ms/step - loss: 0.2740 - mse: 0.2591 - rmse: 0.5090 - mae: 0.2740 - mape: 8.4534 - val_loss: 0.2678 - val_mse: 0.2497 - val_rmse: 0.4997 - val_mae: 0.2678 - val_mape: 8.3484 - lr: 0.0010
Epoch 215/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2723 - mse: 0.2560 - rmse: 0.5060 - mae: 0.2723 - mape: 8.3667
Epoch 215: val_loss did not improve from 0.26440
318/318 [=====] - 1s 2ms/step - loss: 0.2734 - mse: 0.2591 - rmse: 0.5091 - mae: 0.2734 - mape: 8.4089 - val_loss: 0.2655 - val_mse: 0.2485 - val_rmse: 0.4985 - val_mae: 0.2655 - val_mape: 8.2219 - lr: 0.0010
Epoch 216/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2736 - mse: 0.2635 - rmse: 0.5133 - mae: 0.2736 - mape: 8.3820
Epoch 216: val_loss did not improve from 0.26440
318/318 [=====] - 0s 1ms/step - loss: 0.2734 - mse: 0.2624 - rmse: 0.5123 - mae: 0.2734 - mape: 8.3725 - val_loss: 0.2798 - val_mse: 0.2590 - val_rmse: 0.5090 - val_mae: 0.2798 - val_mape: 8.7375 - lr: 0.0010
Epoch 217/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2785 - mse: 0.2687 - rmse: 0.5184 - mae: 0.2785 - mape: 8.5388
Epoch 217: val_loss did not improve from 0.26440
318/318 [=====] - 1s 2ms/step - loss: 0.2777 - mse: 0.2666 - rmse: 0.5163 - mae: 0.2777 - mape: 8.5072 - val_loss: 0.2713 - val_mse: 0.2653 - val_rmse: 0.5151 - val_mae: 0.2713 - val_mape: 8.6307 - lr: 0.0010
Epoch 218/2000
268/318 [=====>...] - ETA: 0s - loss: 0.2823 - mse: 0.2778 - rmse: 0.5271 - mae: 0.2823 - mape: 8.6377
Epoch 218: val_loss did not improve from 0.26440
318/318 [=====] - 0s 2ms/step - loss: 0.2775 - mse: 0.2680 - rmse: 0.5177 - mae: 0.2775 - mape: 8.5117 - val_loss: 0.2800 - val_mse: 0.2872 - val_rmse: 0.5359 - val_mae: 0.2800 - val_mape: 9.0871 - lr: 0.0010
Epoch 219/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2773 - mse: 0.2752 - rmse: 0.5246 - mae: 0.2773 - mape: 8.5384
Epoch 219: val_loss did not improve from 0.26440
318/318 [=====] - 1s 2ms/step - loss: 0.2777 - mse: 0.2755 - rmse: 0.5249 - mae: 0.2777 - mape: 8.5498 - val_loss: 0.2677 - val_mse: 0.2468 - val_rmse: 0.4968 - val_mae: 0.2677 - val_mape: 8.3062 - lr: 0.0010
Epoch 220/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2739 - mse: 0.2615 - rmse: 0.5114 - mae: 0.2739 - mape: 8.4185
Epoch 220: val_loss did not improve from 0.26440
318/318 [=====] - 1s 2ms/step - loss: 0.2738 - mse: 0.2613 - rmse: 0.5112 - mae: 0.2738 - mape: 8.4129 - val_loss: 0.2947 - val_mse: 0.3127 - val_rmse: 0.5592 - val_mae: 0.2947 - val_mape: 8.3223 - lr: 0.0010
Epoch 221/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2754 - mse: 0.2668 - rmse: 0.5165 - mae: 0.2754 - mape: 8.4487

Epoch 221: val_loss did not improve from 0.26440
 318/318 [=====] - 0s 2ms/step - loss: 0.2749 - mse: 0.2652 - rmse: 0.5150 - mae: 0.2749 - mape: 8.4313 - val_loss: 0.2679 - val_mse: 0.2475 - val_rmse: 0.4975 - val_mae: 0.2679 - val_mape: 8.3432 - lr: 0.0010
 Epoch 222/2000
 302/318 [=====>..] - ETA: 0s - loss: 0.2735 - mse: 0.2618 - rmse: 0.5116 - mae: 0.2735 - mape: 8.4165
 Epoch 222: val_loss did not improve from 0.26440
 318/318 [=====] - 1s 2ms/step - loss: 0.2743 - mse: 0.2626 - rmse: 0.5125 - mae: 0.2743 - mape: 8.4319 - val_loss: 0.2869 - val_mse: 0.2806 - val_rmse: 0.5297 - val_mae: 0.2869 - val_mape: 9.1774 - lr: 0.0010
 Epoch 223/2000
 306/318 [=====>..] - ETA: 0s - loss: 0.2803 - mse: 0.2733 - rmse: 0.5228 - mae: 0.2803 - mape: 8.6161
 Epoch 223: val_loss did not improve from 0.26440
 318/318 [=====] - 0s 2ms/step - loss: 0.2798 - mse: 0.2725 - rmse: 0.5220 - mae: 0.2798 - mape: 8.6013 - val_loss: 0.2873 - val_mse: 0.2848 - val_rmse: 0.5337 - val_mae: 0.2873 - val_mape: 8.3659 - lr: 0.0010
 Epoch 224/2000
 312/318 [=====>.] - ETA: 0s - loss: 0.2736 - mse: 0.2622 - rmse: 0.5121 - mae: 0.2736 - mape: 8.4001
 Epoch 224: val_loss did not improve from 0.26440
 318/318 [=====] - 1s 2ms/step - loss: 0.2743 - mse: 0.2635 - rmse: 0.5133 - mae: 0.2743 - mape: 8.4237 - val_loss: 0.2698 - val_mse: 0.2570 - val_rmse: 0.5070 - val_mae: 0.2698 - val_mape: 8.0780 - lr: 0.0010
 Epoch 225/2000
 311/318 [=====>..] - ETA: 0s - loss: 0.2740 - mse: 0.2650 - rmse: 0.5148 - mae: 0.2740 - mape: 8.4035
 Epoch 225: val_loss did not improve from 0.26440
 318/318 [=====] - 0s 2ms/step - loss: 0.2735 - mse: 0.2640 - rmse: 0.5138 - mae: 0.2735 - mape: 8.3924 - val_loss: 0.2800 - val_mse: 0.2779 - val_rmse: 0.5272 - val_mae: 0.2800 - val_mape: 8.1901 - lr: 0.0010
 Epoch 226/2000
 311/318 [=====>..] - ETA: 0s - loss: 0.2750 - mse: 0.2673 - rmse: 0.5170 - mae: 0.2750 - mape: 8.4706
 Epoch 226: val_loss did not improve from 0.26440
 318/318 [=====] - 0s 2ms/step - loss: 0.2745 - mse: 0.2675 - rmse: 0.5172 - mae: 0.2745 - mape: 8.4605 - val_loss: 0.2652 - val_mse: 0.2582 - val_rmse: 0.5081 - val_mae: 0.2652 - val_mape: 8.2478 - lr: 0.0010
 Epoch 227/2000
 309/318 [=====>..] - ETA: 0s - loss: 0.2794 - mse: 0.2737 - rmse: 0.5232 - mae: 0.2794 - mape: 8.5520
 Epoch 227: val_loss did not improve from 0.26440
 318/318 [=====] - 0s 2ms/step - loss: 0.2795 - mse: 0.2735 - rmse: 0.5229 - mae: 0.2795 - mape: 8.5617 - val_loss: 0.2700 - val_mse: 0.2514 - val_rmse: 0.5014 - val_mae: 0.2700 - val_mape: 8.6975 - lr: 0.0010
 Epoch 228/2000
 309/318 [=====>..] - ETA: 0s - loss: 0.2710 - mse: 0.2638

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- rmse: 0.5136 - mae: 0.2710 - mape: 8.3747
Epoch 228: val_loss did not improve from 0.26440
318/318 [=====] - 0s 2ms/step - loss: 0.2701 - mse:
0.2626 - rmse: 0.5124 - mae: 0.2701 - mape: 8.3487 - val_loss: 0.2719 - val_mse:
0.2556 - val_rmse: 0.5056 - val_mae: 0.2719 - val_mape: 8.1071 - lr: 0.0010
Epoch 229/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2708 - mse: 0.2615
- rmse: 0.5114 - mae: 0.2708 - mape: 8.3079
Epoch 229: val_loss did not improve from 0.26440
318/318 [=====] - 0s 1ms/step - loss: 0.2721 - mse:
0.2634 - rmse: 0.5132 - mae: 0.2721 - mape: 8.3581 - val_loss: 0.2666 - val_mse:
0.2536 - val_rmse: 0.5036 - val_mae: 0.2666 - val_mape: 7.9104 - lr: 0.0010
Epoch 230/2000
269/318 [=====>...] - ETA: 0s - loss: 0.2708 - mse: 0.2576
- rmse: 0.5076 - mae: 0.2708 - mape: 8.3110
Epoch 230: val_loss did not improve from 0.26440
318/318 [=====] - 0s 1ms/step - loss: 0.2734 - mse:
0.2646 - rmse: 0.5144 - mae: 0.2734 - mape: 8.3786 - val_loss: 0.3022 - val_mse:
0.3038 - val_rmse: 0.5512 - val_mae: 0.3022 - val_mape: 10.1154 - lr: 0.0010
Epoch 231/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2764 - mse: 0.2720
- rmse: 0.5215 - mae: 0.2764 - mape: 8.5098
Epoch 231: val_loss did not improve from 0.26440
318/318 [=====] - 0s 1ms/step - loss: 0.2764 - mse:
0.2720 - rmse: 0.5216 - mae: 0.2764 - mape: 8.5074 - val_loss: 0.2711 - val_mse:
0.2551 - val_rmse: 0.5051 - val_mae: 0.2711 - val_mape: 8.2432 - lr: 0.0010
Epoch 232/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2694 - mse: 0.2564
- rmse: 0.5064 - mae: 0.2694 - mape: 8.3313
Epoch 232: val_loss improved from 0.26440 to 0.26404, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2712 - mse:
0.2588 - rmse: 0.5087 - mae: 0.2712 - mape: 8.3700 - val_loss: 0.2640 - val_mse:
0.2437 - val_rmse: 0.4937 - val_mae: 0.2640 - val_mape: 8.1156 - lr: 0.0010
Epoch 233/2000
272/318 [=====>...] - ETA: 0s - loss: 0.2741 - mse: 0.2585
- rmse: 0.5084 - mae: 0.2741 - mape: 8.4515
Epoch 233: val_loss did not improve from 0.26404
318/318 [=====] - 0s 1ms/step - loss: 0.2749 - mse:
0.2615 - rmse: 0.5114 - mae: 0.2749 - mape: 8.4499 - val_loss: 0.2729 - val_mse:
0.2582 - val_rmse: 0.5082 - val_mae: 0.2729 - val_mape: 8.2622 - lr: 0.0010
Epoch 234/2000
273/318 [=====>...] - ETA: 0s - loss: 0.2738 - mse: 0.2668
- rmse: 0.5165 - mae: 0.2738 - mape: 8.4464
Epoch 234: val_loss did not improve from 0.26404
318/318 [=====] - 0s 1ms/step - loss: 0.2734 - mse:
0.2642 - rmse: 0.5140 - mae: 0.2734 - mape: 8.4520 - val_loss: 0.2751 - val_mse:
0.2528 - val_rmse: 0.5028 - val_mae: 0.2751 - val_mape: 8.6667 - lr: 0.0010

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Epoch 235/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2751 - mse: 0.2641
- rmse: 0.5139 - mae: 0.2751 - mape: 8.4601
Epoch 235: val_loss did not improve from 0.26404
318/318 [=====] - 0s 1ms/step - loss: 0.2731 - mse:
0.2609 - rmse: 0.5108 - mae: 0.2731 - mape: 8.4079 - val_loss: 0.2649 - val_mse:
0.2530 - val_rmse: 0.5030 - val_mae: 0.2649 - val_mape: 8.0594 - lr: 0.0010
Epoch 236/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2709 - mse: 0.2631
- rmse: 0.5129 - mae: 0.2709 - mape: 8.3060
Epoch 236: val_loss improved from 0.26404 to 0.26227, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2718 - mse:
0.2644 - rmse: 0.5142 - mae: 0.2718 - mape: 8.3299 - val_loss: 0.2623 - val_mse:
0.2488 - val_rmse: 0.4988 - val_mae: 0.2623 - val_mape: 8.1572 - lr: 0.0010
Epoch 237/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2775 - mse: 0.2678
- rmse: 0.5175 - mae: 0.2775 - mape: 8.5313
Epoch 237: val_loss did not improve from 0.26227
318/318 [=====] - 1s 2ms/step - loss: 0.2760 - mse:
0.2646 - rmse: 0.5144 - mae: 0.2760 - mape: 8.4726 - val_loss: 0.2699 - val_mse:
0.2601 - val_rmse: 0.5100 - val_mae: 0.2699 - val_mape: 8.0463 - lr: 0.0010
Epoch 238/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2762 - mse: 0.2698
- rmse: 0.5195 - mae: 0.2762 - mape: 8.4807
Epoch 238: val_loss did not improve from 0.26227
318/318 [=====] - 0s 1ms/step - loss: 0.2741 - mse:
0.2644 - rmse: 0.5142 - mae: 0.2741 - mape: 8.4209 - val_loss: 0.2627 - val_mse:
0.2519 - val_rmse: 0.5019 - val_mae: 0.2627 - val_mape: 8.2047 - lr: 0.0010
Epoch 239/2000
261/318 [=====>...] - ETA: 0s - loss: 0.2735 - mse: 0.2626
- rmse: 0.5124 - mae: 0.2735 - mape: 8.4209
Epoch 239: val_loss did not improve from 0.26227
318/318 [=====] - 0s 2ms/step - loss: 0.2736 - mse:
0.2635 - rmse: 0.5133 - mae: 0.2736 - mape: 8.4092 - val_loss: 0.2654 - val_mse:
0.2499 - val_rmse: 0.4999 - val_mae: 0.2654 - val_mape: 8.2645 - lr: 0.0010
Epoch 240/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2716 - mse: 0.2590
- rmse: 0.5089 - mae: 0.2716 - mape: 8.3290
Epoch 240: val_loss did not improve from 0.26227
318/318 [=====] - 0s 2ms/step - loss: 0.2710 - mse:
0.2598 - rmse: 0.5097 - mae: 0.2710 - mape: 8.3010 - val_loss: 0.2698 - val_mse:
0.2628 - val_rmse: 0.5126 - val_mae: 0.2698 - val_mape: 8.0164 - lr: 0.0010
Epoch 241/2000
289/318 [=====>...] - ETA: 0s - loss: 0.2784 - mse: 0.2744
- rmse: 0.5239 - mae: 0.2784 - mape: 8.5603
Epoch 241: val_loss improved from 0.26227 to 0.26217, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 1s 2ms/step - loss: 0.2773 - mse: 0.2715 - rmse: 0.5211 - mae: 0.2773 - mape: 8.5222 - val_loss: 0.2622 - val_mse: 0.2502 - val_rmse: 0.5002 - val_mae: 0.2622 - val_mape: 8.0829 - lr: 0.0010
Epoch 242/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2697 - mse: 0.2629 - rmse: 0.5127 - mae: 0.2697 - mape: 8.3255
Epoch 242: val_loss did not improve from 0.26217
318/318 [=====] - 1s 2ms/step - loss: 0.2700 - mse: 0.2627 - rmse: 0.5126 - mae: 0.2700 - mape: 8.3267 - val_loss: 0.2704 - val_mse: 0.2515 - val_rmse: 0.5015 - val_mae: 0.2704 - val_mape: 8.6426 - lr: 0.0010
Epoch 243/2000
301/318 [=====>..] - ETA: 0s - loss: 0.2694 - mse: 0.2569 - rmse: 0.5069 - mae: 0.2694 - mape: 8.2583
Epoch 243: val_loss did not improve from 0.26217
318/318 [=====] - 1s 2ms/step - loss: 0.2698 - mse: 0.2578 - rmse: 0.5077 - mae: 0.2698 - mape: 8.2778 - val_loss: 0.2636 - val_mse: 0.2501 - val_rmse: 0.5001 - val_mae: 0.2636 - val_mape: 8.1175 - lr: 0.0010
Epoch 244/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2717 - mse: 0.2620 - rmse: 0.5119 - mae: 0.2717 - mape: 8.3649
Epoch 244: val_loss improved from 0.26217 to 0.26153, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2719 - mse: 0.2612 - rmse: 0.5111 - mae: 0.2719 - mape: 8.3658 - val_loss: 0.2615 - val_mse: 0.2435 - val_rmse: 0.4934 - val_mae: 0.2615 - val_mape: 7.9434 - lr: 0.0010
Epoch 245/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2705 - mse: 0.2600 - rmse: 0.5099 - mae: 0.2705 - mape: 8.2867
Epoch 245: val_loss did not improve from 0.26153
318/318 [=====] - 1s 2ms/step - loss: 0.2718 - mse: 0.2626 - rmse: 0.5125 - mae: 0.2718 - mape: 8.3216 - val_loss: 0.2824 - val_mse: 0.2817 - val_rmse: 0.5308 - val_mae: 0.2824 - val_mape: 8.1801 - lr: 0.0010
Epoch 246/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2756 - mse: 0.2686 - rmse: 0.5183 - mae: 0.2756 - mape: 8.4630
Epoch 246: val_loss did not improve from 0.26153
318/318 [=====] - 1s 2ms/step - loss: 0.2753 - mse: 0.2676 - rmse: 0.5173 - mae: 0.2753 - mape: 8.4479 - val_loss: 0.2708 - val_mse: 0.2454 - val_rmse: 0.4954 - val_mae: 0.2708 - val_mape: 8.3857 - lr: 0.0010
Epoch 247/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2723 - mse: 0.2622 - rmse: 0.5120 - mae: 0.2723 - mape: 8.3914
Epoch 247: val_loss did not improve from 0.26153
318/318 [=====] - 1s 2ms/step - loss: 0.2721 - mse: 0.2617 - rmse: 0.5116 - mae: 0.2721 - mape: 8.3931 - val_loss: 0.2742 - val_mse: 0.2692 - val_rmse: 0.5188 - val_mae: 0.2742 - val_mape: 8.0991 - lr: 0.0010
Epoch 248/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2745 - mse: 0.2667

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- rmse: 0.5164 - mae: 0.2745 - mape: 8.4412
Epoch 248: val_loss did not improve from 0.26153
318/318 [=====] - 1s 2ms/step - loss: 0.2745 - mse:
0.2666 - rmse: 0.5163 - mae: 0.2745 - mape: 8.4415 - val_loss: 0.2860 - val_mse:
0.2979 - val_rmse: 0.5458 - val_mae: 0.2860 - val_mape: 9.1857 - lr: 0.0010
Epoch 249/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2724 - mse: 0.2623
- rmse: 0.5121 - mae: 0.2724 - mape: 8.4031
Epoch 249: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2717 - mse:
0.2618 - rmse: 0.5116 - mae: 0.2717 - mape: 8.3651 - val_loss: 0.2826 - val_mse:
0.2678 - val_rmse: 0.5175 - val_mae: 0.2826 - val_mape: 8.3527 - lr: 0.0010
Epoch 250/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2728 - mse: 0.2614
- rmse: 0.5113 - mae: 0.2728 - mape: 8.4180
Epoch 250: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2747 - mse:
0.2644 - rmse: 0.5142 - mae: 0.2747 - mape: 8.4834 - val_loss: 0.2647 - val_mse:
0.2455 - val_rmse: 0.4954 - val_mae: 0.2647 - val_mape: 7.9163 - lr: 0.0010
Epoch 251/2000
267/318 [=====>...] - ETA: 0s - loss: 0.2723 - mse: 0.2644
- rmse: 0.5142 - mae: 0.2723 - mape: 8.3963
Epoch 251: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2737 - mse:
0.2666 - rmse: 0.5164 - mae: 0.2737 - mape: 8.4118 - val_loss: 0.2696 - val_mse:
0.2558 - val_rmse: 0.5058 - val_mae: 0.2696 - val_mape: 8.3886 - lr: 0.0010
Epoch 252/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2756 - mse: 0.2647
- rmse: 0.5145 - mae: 0.2756 - mape: 8.4835
Epoch 252: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2771 - mse:
0.2674 - rmse: 0.5171 - mae: 0.2771 - mape: 8.5191 - val_loss: 0.2843 - val_mse:
0.2829 - val_rmse: 0.5319 - val_mae: 0.2843 - val_mape: 8.2830 - lr: 0.0010
Epoch 253/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2718 - mse: 0.2622
- rmse: 0.5121 - mae: 0.2718 - mape: 8.3567
Epoch 253: val_loss did not improve from 0.26153
318/318 [=====] - 1s 2ms/step - loss: 0.2717 - mse:
0.2615 - rmse: 0.5113 - mae: 0.2717 - mape: 8.3771 - val_loss: 0.2653 - val_mse:
0.2552 - val_rmse: 0.5051 - val_mae: 0.2653 - val_mape: 8.2265 - lr: 0.0010
Epoch 254/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2739 - mse: 0.2621
- rmse: 0.5119 - mae: 0.2739 - mape: 8.4875
Epoch 254: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2711 - mse:
0.2586 - rmse: 0.5085 - mae: 0.2711 - mape: 8.3903 - val_loss: 0.2761 - val_mse:
0.2990 - val_rmse: 0.5468 - val_mae: 0.2761 - val_mape: 7.8109 - lr: 0.0010
Epoch 255/2000

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282/318 [=====>...] - ETA: 0s - loss: 0.2742 - mse: 0.2673
- rmse: 0.5171 - mae: 0.2742 - mape: 8.4108
Epoch 255: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2741 - mse:
0.2668 - rmse: 0.5165 - mae: 0.2741 - mape: 8.4235 - val_loss: 0.2641 - val_mse:
0.2507 - val_rmse: 0.5007 - val_mae: 0.2641 - val_mape: 8.1481 - lr: 0.0010
Epoch 256/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2722 - mse: 0.2619
- rmse: 0.5117 - mae: 0.2722 - mape: 8.3795
Epoch 256: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2722 - mse:
0.2621 - rmse: 0.5119 - mae: 0.2722 - mape: 8.3846 - val_loss: 0.2997 - val_mse:
0.3225 - val_rmse: 0.5679 - val_mae: 0.2997 - val_mape: 9.7083 - lr: 0.0010
Epoch 257/2000
298/318 [=====>..] - ETA: 0s - loss: 0.2818 - mse: 0.2779
- rmse: 0.5271 - mae: 0.2818 - mape: 8.7366
Epoch 257: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2813 - mse:
0.2766 - rmse: 0.5259 - mae: 0.2813 - mape: 8.7129 - val_loss: 0.2779 - val_mse:
0.2748 - val_rmse: 0.5242 - val_mae: 0.2779 - val_mape: 8.9678 - lr: 0.0010
Epoch 258/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2679 - mse: 0.2511
- rmse: 0.5011 - mae: 0.2679 - mape: 8.2598
Epoch 258: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2687 - mse:
0.2521 - rmse: 0.5021 - mae: 0.2687 - mape: 8.2883 - val_loss: 0.2882 - val_mse:
0.3071 - val_rmse: 0.5541 - val_mae: 0.2882 - val_mape: 9.3862 - lr: 0.0010
Epoch 259/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2717 - mse: 0.2615
- rmse: 0.5114 - mae: 0.2717 - mape: 8.3919
Epoch 259: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2721 - mse:
0.2626 - rmse: 0.5125 - mae: 0.2721 - mape: 8.3903 - val_loss: 0.2795 - val_mse:
0.2714 - val_rmse: 0.5209 - val_mae: 0.2795 - val_mape: 9.0046 - lr: 0.0010
Epoch 260/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2714 - mse: 0.2592
- rmse: 0.5091 - mae: 0.2714 - mape: 8.3802
Epoch 260: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2715 - mse:
0.2591 - rmse: 0.5090 - mae: 0.2715 - mape: 8.3898 - val_loss: 0.2629 - val_mse:
0.2460 - val_rmse: 0.4960 - val_mae: 0.2629 - val_mape: 8.1566 - lr: 0.0010
Epoch 261/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2738 - mse: 0.2664
- rmse: 0.5161 - mae: 0.2738 - mape: 8.4961
Epoch 261: val_loss did not improve from 0.26153
318/318 [=====] - 1s 2ms/step - loss: 0.2738 - mse:
0.2667 - rmse: 0.5164 - mae: 0.2738 - mape: 8.4921 - val_loss: 0.2787 - val_mse:
0.2761 - val_rmse: 0.5255 - val_mae: 0.2787 - val_mape: 8.9761 - lr: 0.0010

Epoch 262/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2704 - mse: 0.2572
- rmse: 0.5071 - mae: 0.2704 - mape: 8.3456
Epoch 262: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2704 - mse:
0.2579 - rmse: 0.5078 - mae: 0.2704 - mape: 8.3398 - val_loss: 0.2867 - val_mse:
0.2807 - val_rmse: 0.5298 - val_mae: 0.2867 - val_mape: 8.4692 - lr: 0.0010
Epoch 263/2000
266/318 [=====>...] - ETA: 0s - loss: 0.2670 - mse: 0.2477
- rmse: 0.4977 - mae: 0.2670 - mape: 8.2566
Epoch 263: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2706 - mse:
0.2565 - rmse: 0.5065 - mae: 0.2706 - mape: 8.3554 - val_loss: 0.2733 - val_mse:
0.2633 - val_rmse: 0.5131 - val_mae: 0.2733 - val_mape: 8.2020 - lr: 0.0010
Epoch 264/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2711 - mse: 0.2571
- rmse: 0.5070 - mae: 0.2711 - mape: 8.3915
Epoch 264: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2715 - mse:
0.2583 - rmse: 0.5082 - mae: 0.2715 - mape: 8.4056 - val_loss: 0.2635 - val_mse:
0.2432 - val_rmse: 0.4932 - val_mae: 0.2635 - val_mape: 8.2153 - lr: 0.0010
Epoch 265/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2723 - mse: 0.2591
- rmse: 0.5090 - mae: 0.2723 - mape: 8.4130
Epoch 265: val_loss did not improve from 0.26153
318/318 [=====] - 1s 2ms/step - loss: 0.2716 - mse:
0.2578 - rmse: 0.5077 - mae: 0.2716 - mape: 8.3868 - val_loss: 0.2637 - val_mse:
0.2484 - val_rmse: 0.4984 - val_mae: 0.2637 - val_mape: 7.9694 - lr: 0.0010
Epoch 266/2000
318/318 [=====] - ETA: 0s - loss: 0.2724 - mse: 0.2611
- rmse: 0.5110 - mae: 0.2724 - mape: 8.4244
Epoch 266: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2724 - mse:
0.2611 - rmse: 0.5110 - mae: 0.2724 - mape: 8.4244 - val_loss: 0.2658 - val_mse:
0.2516 - val_rmse: 0.5016 - val_mae: 0.2658 - val_mape: 7.9340 - lr: 0.0010
Epoch 267/2000
263/318 [=====>...] - ETA: 0s - loss: 0.2688 - mse: 0.2558
- rmse: 0.5058 - mae: 0.2688 - mape: 8.2706
Epoch 267: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2703 - mse:
0.2594 - rmse: 0.5093 - mae: 0.2703 - mape: 8.3028 - val_loss: 0.2648 - val_mse:
0.2554 - val_rmse: 0.5054 - val_mae: 0.2648 - val_mape: 8.3857 - lr: 0.0010
Epoch 268/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2741 - mse: 0.2663
- rmse: 0.5161 - mae: 0.2741 - mape: 8.4282
Epoch 268: val_loss did not improve from 0.26153
318/318 [=====] - 1s 2ms/step - loss: 0.2723 - mse:
0.2634 - rmse: 0.5132 - mae: 0.2723 - mape: 8.3834 - val_loss: 0.2711 - val_mse:

0.2740 - val_rmse: 0.5235 - val_mae: 0.2711 - val_mape: 7.8512 - lr: 0.0010
Epoch 269/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2725 - mse: 0.2612
- rmse: 0.5110 - mae: 0.2725 - mape: 8.3479
Epoch 269: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2724 - mse:
0.2597 - rmse: 0.5096 - mae: 0.2724 - mape: 8.3638 - val_loss: 0.2781 - val_mse:
0.2792 - val_rmse: 0.5284 - val_mae: 0.2781 - val_mape: 8.9799 - lr: 0.0010
Epoch 270/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2714 - mse: 0.2640
- rmse: 0.5138 - mae: 0.2714 - mape: 8.3122
Epoch 270: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2709 - mse:
0.2626 - rmse: 0.5124 - mae: 0.2709 - mape: 8.3175 - val_loss: 0.2643 - val_mse:
0.2472 - val_rmse: 0.4972 - val_mae: 0.2643 - val_mape: 8.3156 - lr: 0.0010
Epoch 271/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2715 - mse: 0.2633
- rmse: 0.5131 - mae: 0.2715 - mape: 8.4198
Epoch 271: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2702 - mse:
0.2597 - rmse: 0.5096 - mae: 0.2702 - mape: 8.3605 - val_loss: 0.2625 - val_mse:
0.2461 - val_rmse: 0.4961 - val_mae: 0.2625 - val_mape: 8.0210 - lr: 0.0010
Epoch 272/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2701 - mse: 0.2613
- rmse: 0.5111 - mae: 0.2701 - mape: 8.3363
Epoch 272: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2704 - mse:
0.2618 - rmse: 0.5117 - mae: 0.2704 - mape: 8.3440 - val_loss: 0.2759 - val_mse:
0.2644 - val_rmse: 0.5142 - val_mae: 0.2759 - val_mape: 8.4090 - lr: 0.0010
Epoch 273/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2744 - mse: 0.2634
- rmse: 0.5132 - mae: 0.2744 - mape: 8.4842
Epoch 273: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2733 - mse:
0.2630 - rmse: 0.5129 - mae: 0.2733 - mape: 8.4480 - val_loss: 0.2662 - val_mse:
0.2522 - val_rmse: 0.5022 - val_mae: 0.2662 - val_mape: 7.9173 - lr: 0.0010
Epoch 274/2000
294/318 [=====>...] - ETA: 0s - loss: 0.2708 - mse: 0.2582
- rmse: 0.5082 - mae: 0.2708 - mape: 8.3542
Epoch 274: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2700 - mse:
0.2579 - rmse: 0.5078 - mae: 0.2700 - mape: 8.3261 - val_loss: 0.2624 - val_mse:
0.2526 - val_rmse: 0.5026 - val_mae: 0.2624 - val_mape: 8.0759 - lr: 0.0010
Epoch 275/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2707 - mse: 0.2585
- rmse: 0.5084 - mae: 0.2707 - mape: 8.3656
Epoch 275: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2709 - mse:

0.2595 - rmse: 0.5094 - mae: 0.2709 - mape: 8.3547 - val_loss: 0.2624 - val_mse:
0.2512 - val_rmse: 0.5012 - val_mae: 0.2624 - val_mape: 7.8576 - lr: 0.0010
Epoch 276/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2746 - mse: 0.2710
- rmse: 0.5206 - mae: 0.2746 - mape: 8.4369
Epoch 276: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2742 - mse:
0.2701 - rmse: 0.5197 - mae: 0.2742 - mape: 8.4297 - val_loss: 0.2779 - val_mse:
0.2609 - val_rmse: 0.5108 - val_mae: 0.2779 - val_mape: 8.3403 - lr: 0.0010
Epoch 277/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2707 - mse: 0.2609
- rmse: 0.5108 - mae: 0.2707 - mape: 8.3684
Epoch 277: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2705 - mse:
0.2599 - rmse: 0.5098 - mae: 0.2705 - mape: 8.3621 - val_loss: 0.2699 - val_mse:
0.2568 - val_rmse: 0.5067 - val_mae: 0.2699 - val_mape: 8.5426 - lr: 0.0010
Epoch 278/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2686 - mse: 0.2551
- rmse: 0.5051 - mae: 0.2686 - mape: 8.3146
Epoch 278: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2693 - mse:
0.2565 - rmse: 0.5065 - mae: 0.2693 - mape: 8.3265 - val_loss: 0.2619 - val_mse:
0.2418 - val_rmse: 0.4918 - val_mae: 0.2619 - val_mape: 8.0293 - lr: 0.0010
Epoch 279/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2712 - mse: 0.2588
- rmse: 0.5087 - mae: 0.2712 - mape: 8.3603
Epoch 279: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2704 - mse:
0.2593 - rmse: 0.5092 - mae: 0.2704 - mape: 8.3511 - val_loss: 0.2662 - val_mse:
0.2511 - val_rmse: 0.5011 - val_mae: 0.2662 - val_mape: 8.4885 - lr: 0.0010
Epoch 280/2000
268/318 [=====>...] - ETA: 0s - loss: 0.2691 - mse: 0.2558
- rmse: 0.5058 - mae: 0.2691 - mape: 8.2700
Epoch 280: val_loss did not improve from 0.26153
318/318 [=====] - 0s 1ms/step - loss: 0.2708 - mse:
0.2597 - rmse: 0.5097 - mae: 0.2708 - mape: 8.3249 - val_loss: 0.2676 - val_mse:
0.2474 - val_rmse: 0.4974 - val_mae: 0.2676 - val_mape: 8.4874 - lr: 0.0010
Epoch 281/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2702 - mse: 0.2575
- rmse: 0.5075 - mae: 0.2702 - mape: 8.3272
Epoch 281: val_loss did not improve from 0.26153
318/318 [=====] - 0s 2ms/step - loss: 0.2704 - mse:
0.2581 - rmse: 0.5080 - mae: 0.2704 - mape: 8.3377 - val_loss: 0.2782 - val_mse:
0.2663 - val_rmse: 0.5161 - val_mae: 0.2782 - val_mape: 9.0629 - lr: 0.0010
Epoch 282/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2714 - mse: 0.2609
- rmse: 0.5108 - mae: 0.2714 - mape: 8.4080
Epoch 282: val_loss improved from 0.26153 to 0.26140, saving model to

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model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2706 - mse:
0.2594 - rmse: 0.5093 - mae: 0.2706 - mape: 8.3695 - val_loss: 0.2614 - val_mse:
0.2373 - val_rmse: 0.4872 - val_mae: 0.2614 - val_mape: 7.9844 - lr: 0.0010
Epoch 283/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2721 - mse: 0.2605
- rmse: 0.5104 - mae: 0.2721 - mape: 8.4099
Epoch 283: val_loss did not improve from 0.26140
318/318 [=====] - 1s 2ms/step - loss: 0.2718 - mse:
0.2597 - rmse: 0.5096 - mae: 0.2718 - mape: 8.4143 - val_loss: 0.2616 - val_mse:
0.2472 - val_rmse: 0.4972 - val_mae: 0.2616 - val_mape: 8.2080 - lr: 0.0010
Epoch 284/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2705 - mse: 0.2604
- rmse: 0.5103 - mae: 0.2705 - mape: 8.3687
Epoch 284: val_loss did not improve from 0.26140
318/318 [=====] - 0s 2ms/step - loss: 0.2709 - mse:
0.2606 - rmse: 0.5105 - mae: 0.2709 - mape: 8.3787 - val_loss: 0.2652 - val_mse:
0.2408 - val_rmse: 0.4907 - val_mae: 0.2652 - val_mape: 8.1742 - lr: 0.0010
Epoch 285/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2682 - mse: 0.2550
- rmse: 0.5049 - mae: 0.2682 - mape: 8.3061
Epoch 285: val_loss did not improve from 0.26140
318/318 [=====] - 0s 2ms/step - loss: 0.2681 - mse:
0.2548 - rmse: 0.5048 - mae: 0.2681 - mape: 8.3034 - val_loss: 0.2697 - val_mse:
0.2445 - val_rmse: 0.4945 - val_mae: 0.2697 - val_mape: 8.1372 - lr: 0.0010
Epoch 286/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2699 - mse: 0.2598
- rmse: 0.5097 - mae: 0.2699 - mape: 8.3436
Epoch 286: val_loss did not improve from 0.26140
318/318 [=====] - 1s 2ms/step - loss: 0.2696 - mse:
0.2588 - rmse: 0.5087 - mae: 0.2696 - mape: 8.3459 - val_loss: 0.2646 - val_mse:
0.2466 - val_rmse: 0.4966 - val_mae: 0.2646 - val_mape: 8.3556 - lr: 0.0010
Epoch 287/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2661 - mse: 0.2534
- rmse: 0.5034 - mae: 0.2661 - mape: 8.2030
Epoch 287: val_loss did not improve from 0.26140
318/318 [=====] - 0s 2ms/step - loss: 0.2666 - mse:
0.2537 - rmse: 0.5037 - mae: 0.2666 - mape: 8.2154 - val_loss: 0.2672 - val_mse:
0.2603 - val_rmse: 0.5102 - val_mae: 0.2672 - val_mape: 7.9460 - lr: 0.0010
Epoch 288/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2765 - mse: 0.2714
- rmse: 0.5210 - mae: 0.2765 - mape: 8.5645
Epoch 288: val_loss did not improve from 0.26140
318/318 [=====] - 0s 2ms/step - loss: 0.2769 - mse:
0.2716 - rmse: 0.5211 - mae: 0.2769 - mape: 8.5662 - val_loss: 0.2674 - val_mse:
0.2403 - val_rmse: 0.4903 - val_mae: 0.2674 - val_mape: 8.2939 - lr: 0.0010
Epoch 289/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2664 - mse: 0.2558

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- rmse: 0.5057 - mae: 0.2664 - mape: 8.2429
Epoch 289: val_loss did not improve from 0.26140
318/318 [=====] - 0s 2ms/step - loss: 0.2669 - mse:
0.2573 - rmse: 0.5073 - mae: 0.2669 - mape: 8.2565 - val_loss: 0.2643 - val_mse:
0.2511 - val_rmse: 0.5011 - val_mae: 0.2643 - val_mape: 8.4444 - lr: 0.0010
Epoch 290/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2692 - mse: 0.2579
- rmse: 0.5079 - mae: 0.2692 - mape: 8.3812
Epoch 290: val_loss did not improve from 0.26140
318/318 [=====] - 1s 2ms/step - loss: 0.2703 - mse:
0.2595 - rmse: 0.5095 - mae: 0.2703 - mape: 8.4096 - val_loss: 0.2751 - val_mse:
0.2654 - val_rmse: 0.5152 - val_mae: 0.2751 - val_mape: 8.8727 - lr: 0.0010
Epoch 291/2000
266/318 [=====>...] - ETA: 0s - loss: 0.2659 - mse: 0.2538
- rmse: 0.5038 - mae: 0.2659 - mape: 8.2228
Epoch 291: val_loss improved from 0.26140 to 0.25980, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2666 - mse:
0.2544 - rmse: 0.5044 - mae: 0.2666 - mape: 8.2466 - val_loss: 0.2598 - val_mse:
0.2429 - val_rmse: 0.4928 - val_mae: 0.2598 - val_mape: 8.1150 - lr: 0.0010
Epoch 292/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2664 - mse: 0.2565
- rmse: 0.5064 - mae: 0.2664 - mape: 8.2352
Epoch 292: val_loss did not improve from 0.25980
318/318 [=====] - 0s 1ms/step - loss: 0.2666 - mse:
0.2573 - rmse: 0.5072 - mae: 0.2666 - mape: 8.2297 - val_loss: 0.2629 - val_mse:
0.2471 - val_rmse: 0.4971 - val_mae: 0.2629 - val_mape: 8.2235 - lr: 0.0010
Epoch 293/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2698 - mse: 0.2561
- rmse: 0.5061 - mae: 0.2698 - mape: 8.3295
Epoch 293: val_loss improved from 0.25980 to 0.25902, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2688 - mse:
0.2551 - rmse: 0.5050 - mae: 0.2688 - mape: 8.2971 - val_loss: 0.2590 - val_mse:
0.2469 - val_rmse: 0.4969 - val_mae: 0.2590 - val_mape: 8.0865 - lr: 0.0010
Epoch 294/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2727 - mse: 0.2649
- rmse: 0.5147 - mae: 0.2727 - mape: 8.4226
Epoch 294: val_loss did not improve from 0.25902
318/318 [=====] - 0s 1ms/step - loss: 0.2708 - mse:
0.2602 - rmse: 0.5101 - mae: 0.2708 - mape: 8.3751 - val_loss: 0.2591 - val_mse:
0.2426 - val_rmse: 0.4925 - val_mae: 0.2591 - val_mape: 7.9995 - lr: 0.0010
Epoch 295/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2672 - mse: 0.2532
- rmse: 0.5032 - mae: 0.2672 - mape: 8.2808
Epoch 295: val_loss did not improve from 0.25902
318/318 [=====] - 0s 1ms/step - loss: 0.2670 - mse:
0.2525 - rmse: 0.5025 - mae: 0.2670 - mape: 8.2652 - val_loss: 0.2964 - val_mse:

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0.3173 - val_rmse: 0.5633 - val_mae: 0.2964 - val_mape: 9.5244 - lr: 0.0010
Epoch 296/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2673 - mse: 0.2550
- rmse: 0.5050 - mae: 0.2673 - mape: 8.2514
Epoch 296: val_loss did not improve from 0.25902
318/318 [=====] - 0s 1ms/step - loss: 0.2666 - mse:
0.2540 - rmse: 0.5040 - mae: 0.2666 - mape: 8.2451 - val_loss: 0.2751 - val_mse:
0.2612 - val_rmse: 0.5111 - val_mae: 0.2751 - val_mape: 8.0802 - lr: 0.0010
Epoch 297/2000
272/318 [=====>...] - ETA: 0s - loss: 0.2689 - mse: 0.2578
- rmse: 0.5077 - mae: 0.2689 - mape: 8.2940
Epoch 297: val_loss did not improve from 0.25902
318/318 [=====] - 0s 1ms/step - loss: 0.2693 - mse:
0.2592 - rmse: 0.5091 - mae: 0.2693 - mape: 8.3094 - val_loss: 0.2632 - val_mse:
0.2545 - val_rmse: 0.5045 - val_mae: 0.2632 - val_mape: 8.0976 - lr: 0.0010
Epoch 298/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2676 - mse: 0.2535
- rmse: 0.5035 - mae: 0.2676 - mape: 8.2594
Epoch 298: val_loss did not improve from 0.25902
318/318 [=====] - 0s 1ms/step - loss: 0.2687 - mse:
0.2567 - rmse: 0.5067 - mae: 0.2687 - mape: 8.3151 - val_loss: 0.2596 - val_mse:
0.2437 - val_rmse: 0.4937 - val_mae: 0.2596 - val_mape: 8.1309 - lr: 0.0010
Epoch 299/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2688 - mse: 0.2574
- rmse: 0.5074 - mae: 0.2688 - mape: 8.3281
Epoch 299: val_loss did not improve from 0.25902
318/318 [=====] - 0s 1ms/step - loss: 0.2672 - mse:
0.2552 - rmse: 0.5052 - mae: 0.2672 - mape: 8.2761 - val_loss: 0.2627 - val_mse:
0.2490 - val_rmse: 0.4990 - val_mae: 0.2627 - val_mape: 8.2874 - lr: 0.0010
Epoch 300/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2653 - mse: 0.2538
- rmse: 0.5038 - mae: 0.2653 - mape: 8.1578
Epoch 300: val_loss did not improve from 0.25902
318/318 [=====] - 1s 2ms/step - loss: 0.2652 - mse:
0.2539 - rmse: 0.5039 - mae: 0.2652 - mape: 8.1591 - val_loss: 0.2656 - val_mse:
0.2510 - val_rmse: 0.5010 - val_mae: 0.2656 - val_mape: 8.0014 - lr: 0.0010
Epoch 301/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2653 - mse: 0.2546
- rmse: 0.5046 - mae: 0.2653 - mape: 8.1657
Epoch 301: val_loss did not improve from 0.25902
318/318 [=====] - 0s 2ms/step - loss: 0.2654 - mse:
0.2545 - rmse: 0.5045 - mae: 0.2654 - mape: 8.1676 - val_loss: 0.2596 - val_mse:
0.2432 - val_rmse: 0.4932 - val_mae: 0.2596 - val_mape: 8.0966 - lr: 0.0010
Epoch 302/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2698 - mse: 0.2568
- rmse: 0.5067 - mae: 0.2698 - mape: 8.3208
Epoch 302: val_loss did not improve from 0.25902
318/318 [=====] - 0s 2ms/step - loss: 0.2699 - mse:

0.2569 - rmse: 0.5069 - mae: 0.2699 - mape: 8.3247 - val_loss: 0.2712 - val_mse:
0.2447 - val_rmse: 0.4947 - val_mae: 0.2712 - val_mape: 8.6554 - lr: 0.0010
Epoch 303/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2646 - mse: 0.2505
- rmse: 0.5005 - mae: 0.2646 - mape: 8.1501
Epoch 303: val_loss did not improve from 0.25902
318/318 [=====] - 1s 2ms/step - loss: 0.2643 - mse:
0.2508 - rmse: 0.5008 - mae: 0.2643 - mape: 8.1534 - val_loss: 0.2612 - val_mse:
0.2443 - val_rmse: 0.4943 - val_mae: 0.2612 - val_mape: 8.0442 - lr: 0.0010
Epoch 304/2000
261/318 [=====>...] - ETA: 0s - loss: 0.2697 - mse: 0.2599
- rmse: 0.5098 - mae: 0.2697 - mape: 8.3508
Epoch 304: val_loss did not improve from 0.25902
318/318 [=====] - 0s 2ms/step - loss: 0.2705 - mse:
0.2584 - rmse: 0.5084 - mae: 0.2705 - mape: 8.3662 - val_loss: 0.2634 - val_mse:
0.2440 - val_rmse: 0.4940 - val_mae: 0.2634 - val_mape: 8.2160 - lr: 0.0010
Epoch 305/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2663 - mse: 0.2509
- rmse: 0.5009 - mae: 0.2663 - mape: 8.2678
Epoch 305: val_loss did not improve from 0.25902
318/318 [=====] - 0s 2ms/step - loss: 0.2666 - mse:
0.2505 - rmse: 0.5005 - mae: 0.2666 - mape: 8.2770 - val_loss: 0.4077 - val_mse:
0.7552 - val_rmse: 0.8691 - val_mae: 0.4077 - val_mape: 10.4445 - lr: 0.0010
Epoch 306/2000
264/318 [=====>...] - ETA: 0s - loss: 0.2737 - mse: 0.2653
- rmse: 0.5150 - mae: 0.2737 - mape: 8.4986
Epoch 306: val_loss did not improve from 0.25902
318/318 [=====] - 1s 2ms/step - loss: 0.2705 - mse:
0.2586 - rmse: 0.5086 - mae: 0.2705 - mape: 8.4023 - val_loss: 0.2786 - val_mse:
0.2767 - val_rmse: 0.5260 - val_mae: 0.2786 - val_mape: 8.9017 - lr: 0.0010
Epoch 307/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2723 - mse: 0.2627
- rmse: 0.5125 - mae: 0.2723 - mape: 8.4136
Epoch 307: val_loss did not improve from 0.25902
318/318 [=====] - 0s 2ms/step - loss: 0.2725 - mse:
0.2626 - rmse: 0.5125 - mae: 0.2725 - mape: 8.4181 - val_loss: 0.2780 - val_mse:
0.2660 - val_rmse: 0.5158 - val_mae: 0.2780 - val_mape: 8.3206 - lr: 0.0010
Epoch 308/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2709 - mse: 0.2629
- rmse: 0.5127 - mae: 0.2709 - mape: 8.3645
Epoch 308: val_loss did not improve from 0.25902
318/318 [=====] - 0s 2ms/step - loss: 0.2703 - mse:
0.2616 - rmse: 0.5115 - mae: 0.2703 - mape: 8.3511 - val_loss: 0.2600 - val_mse:
0.2427 - val_rmse: 0.4926 - val_mae: 0.2600 - val_mape: 8.0185 - lr: 0.0010
Epoch 309/2000
317/318 [=====>..] - ETA: 0s - loss: 0.2646 - mse: 0.2518
- rmse: 0.5018 - mae: 0.2646 - mape: 8.1729
Epoch 309: val_loss did not improve from 0.25902

318/318 [=====] - 1s 2ms/step - loss: 0.2646 - mse: 0.2517 - rmse: 0.5017 - mae: 0.2646 - mape: 8.1725 - val_loss: 0.2595 - val_mse: 0.2452 - val_rmse: 0.4952 - val_mae: 0.2595 - val_mape: 8.1421 - lr: 0.0010
Epoch 310/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2702 - mse: 0.2578 - rmse: 0.5077 - mae: 0.2702 - mape: 8.3653
Epoch 310: val_loss did not improve from 0.25902
318/318 [=====] - 0s 2ms/step - loss: 0.2702 - mse: 0.2583 - rmse: 0.5082 - mae: 0.2702 - mape: 8.3597 - val_loss: 0.2663 - val_mse: 0.2496 - val_rmse: 0.4996 - val_mae: 0.2663 - val_mape: 7.9802 - lr: 0.0010
Epoch 311/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2671 - mse: 0.2561 - rmse: 0.5060 - mae: 0.2671 - mape: 8.2829
Epoch 311: val_loss did not improve from 0.25902
318/318 [=====] - 0s 1ms/step - loss: 0.2684 - mse: 0.2569 - rmse: 0.5068 - mae: 0.2684 - mape: 8.3212 - val_loss: 0.3031 - val_mse: 0.3129 - val_rmse: 0.5594 - val_mae: 0.3031 - val_mape: 8.7222 - lr: 0.0010
Epoch 312/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2673 - mse: 0.2577 - rmse: 0.5076 - mae: 0.2673 - mape: 8.2792
Epoch 312: val_loss did not improve from 0.25902
318/318 [=====] - 0s 2ms/step - loss: 0.2660 - mse: 0.2547 - rmse: 0.5047 - mae: 0.2660 - mape: 8.2302 - val_loss: 0.2609 - val_mse: 0.2416 - val_rmse: 0.4916 - val_mae: 0.2609 - val_mape: 8.1394 - lr: 0.0010
Epoch 313/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2698 - mse: 0.2587 - rmse: 0.5087 - mae: 0.2698 - mape: 8.2869
Epoch 313: val_loss improved from 0.25902 to 0.25855, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2681 - mse: 0.2575 - rmse: 0.5075 - mae: 0.2681 - mape: 8.2524 - val_loss: 0.2586 - val_mse: 0.2453 - val_rmse: 0.4953 - val_mae: 0.2586 - val_mape: 7.9726 - lr: 0.0010
Epoch 314/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2713 - mse: 0.2622 - rmse: 0.5121 - mae: 0.2713 - mape: 8.3883
Epoch 314: val_loss did not improve from 0.25855
318/318 [=====] - 0s 1ms/step - loss: 0.2692 - mse: 0.2586 - rmse: 0.5086 - mae: 0.2692 - mape: 8.3396 - val_loss: 0.2676 - val_mse: 0.2389 - val_rmse: 0.4888 - val_mae: 0.2676 - val_mape: 8.4326 - lr: 0.0010
Epoch 315/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2730 - mse: 0.2651 - rmse: 0.5149 - mae: 0.2730 - mape: 8.4235
Epoch 315: val_loss did not improve from 0.25855
318/318 [=====] - 0s 2ms/step - loss: 0.2707 - mse: 0.2609 - rmse: 0.5108 - mae: 0.2707 - mape: 8.3645 - val_loss: 0.2591 - val_mse: 0.2405 - val_rmse: 0.4904 - val_mae: 0.2591 - val_mape: 7.9661 - lr: 0.0010
Epoch 316/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2645 - mse: 0.2533

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- rmse: 0.5032 - mae: 0.2645 - mape: 8.1729
Epoch 316: val_loss did not improve from 0.25855
318/318 [=====] - 0s 1ms/step - loss: 0.2653 - mse:
0.2534 - rmse: 0.5033 - mae: 0.2653 - mape: 8.1862 - val_loss: 0.2587 - val_mse:
0.2434 - val_rmse: 0.4933 - val_mae: 0.2587 - val_mape: 8.0051 - lr: 0.0010
Epoch 317/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2670 - mse: 0.2551
- rmse: 0.5050 - mae: 0.2670 - mape: 8.2472
Epoch 317: val_loss did not improve from 0.25855
318/318 [=====] - 0s 1ms/step - loss: 0.2682 - mse:
0.2569 - rmse: 0.5069 - mae: 0.2682 - mape: 8.2731 - val_loss: 0.2909 - val_mse:
0.2990 - val_rmse: 0.5468 - val_mae: 0.2909 - val_mape: 8.4029 - lr: 0.0010
Epoch 318/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2679 - mse: 0.2571
- rmse: 0.5070 - mae: 0.2679 - mape: 8.3174
Epoch 318: val_loss did not improve from 0.25855
318/318 [=====] - 0s 1ms/step - loss: 0.2682 - mse:
0.2579 - rmse: 0.5078 - mae: 0.2682 - mape: 8.3210 - val_loss: 0.2597 - val_mse:
0.2437 - val_rmse: 0.4937 - val_mae: 0.2597 - val_mape: 8.0274 - lr: 0.0010
Epoch 319/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2677 - mse: 0.2629
- rmse: 0.5127 - mae: 0.2677 - mape: 8.2637
Epoch 319: val_loss improved from 0.25855 to 0.25842, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2657 - mse:
0.2593 - rmse: 0.5092 - mae: 0.2657 - mape: 8.2025 - val_loss: 0.2584 - val_mse:
0.2443 - val_rmse: 0.4943 - val_mae: 0.2584 - val_mape: 8.0883 - lr: 0.0010
Epoch 320/2000
272/318 [=====>...] - ETA: 0s - loss: 0.2657 - mse: 0.2533
- rmse: 0.5033 - mae: 0.2657 - mape: 8.1677
Epoch 320: val_loss did not improve from 0.25842
318/318 [=====] - 0s 1ms/step - loss: 0.2644 - mse:
0.2512 - rmse: 0.5012 - mae: 0.2644 - mape: 8.1390 - val_loss: 0.2686 - val_mse:
0.2642 - val_rmse: 0.5140 - val_mae: 0.2686 - val_mape: 8.7267 - lr: 0.0010
Epoch 321/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2661 - mse: 0.2558
- rmse: 0.5058 - mae: 0.2661 - mape: 8.2200
Epoch 321: val_loss did not improve from 0.25842
318/318 [=====] - 0s 2ms/step - loss: 0.2661 - mse:
0.2535 - rmse: 0.5035 - mae: 0.2661 - mape: 8.2404 - val_loss: 0.2777 - val_mse:
0.2618 - val_rmse: 0.5116 - val_mae: 0.2777 - val_mape: 8.9766 - lr: 0.0010
Epoch 322/2000
267/318 [=====>...] - ETA: 0s - loss: 0.2751 - mse: 0.2694
- rmse: 0.5191 - mae: 0.2751 - mape: 8.4792
Epoch 322: val_loss did not improve from 0.25842
318/318 [=====] - 1s 2ms/step - loss: 0.2738 - mse:
0.2662 - rmse: 0.5159 - mae: 0.2738 - mape: 8.4404 - val_loss: 0.2666 - val_mse:
0.2432 - val_rmse: 0.4931 - val_mae: 0.2666 - val_mape: 8.3370 - lr: 0.0010

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Epoch 323/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2664 - mse: 0.2560
- rmse: 0.5060 - mae: 0.2664 - mape: 8.1811
Epoch 323: val_loss did not improve from 0.25842
318/318 [=====] - 0s 2ms/step - loss: 0.2662 - mse:
0.2549 - rmse: 0.5048 - mae: 0.2662 - mape: 8.1682 - val_loss: 0.2644 - val_mse:
0.2432 - val_rmse: 0.4932 - val_mae: 0.2644 - val_mape: 8.4081 - lr: 0.0010
Epoch 324/2000
301/318 [=====>..] - ETA: 0s - loss: 0.2637 - mse: 0.2503
- rmse: 0.5003 - mae: 0.2637 - mape: 8.1537
Epoch 324: val_loss did not improve from 0.25842
318/318 [=====] - 1s 2ms/step - loss: 0.2633 - mse:
0.2492 - rmse: 0.4992 - mae: 0.2633 - mape: 8.1385 - val_loss: 0.2671 - val_mse:
0.2588 - val_rmse: 0.5087 - val_mae: 0.2671 - val_mape: 7.9519 - lr: 0.0010
Epoch 325/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2644 - mse: 0.2520
- rmse: 0.5020 - mae: 0.2644 - mape: 8.2035
Epoch 325: val_loss did not improve from 0.25842
318/318 [=====] - 1s 2ms/step - loss: 0.2642 - mse:
0.2518 - rmse: 0.5018 - mae: 0.2642 - mape: 8.2000 - val_loss: 0.2927 - val_mse:
0.3444 - val_rmse: 0.5868 - val_mae: 0.2927 - val_mape: 8.2672 - lr: 0.0010
Epoch 326/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2661 - mse: 0.2545
- rmse: 0.5045 - mae: 0.2661 - mape: 8.2390
Epoch 326: val_loss did not improve from 0.25842
318/318 [=====] - 0s 2ms/step - loss: 0.2661 - mse:
0.2544 - rmse: 0.5043 - mae: 0.2661 - mape: 8.2329 - val_loss: 0.2657 - val_mse:
0.2580 - val_rmse: 0.5080 - val_mae: 0.2657 - val_mape: 8.4115 - lr: 0.0010
Epoch 327/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2671 - mse: 0.2550
- rmse: 0.5050 - mae: 0.2671 - mape: 8.2753
Epoch 327: val_loss did not improve from 0.25842
318/318 [=====] - 0s 2ms/step - loss: 0.2671 - mse:
0.2551 - rmse: 0.5050 - mae: 0.2671 - mape: 8.2724 - val_loss: 0.2616 - val_mse:
0.2429 - val_rmse: 0.4928 - val_mae: 0.2616 - val_mape: 8.0516 - lr: 0.0010
Epoch 328/2000
269/318 [=====>...] - ETA: 0s - loss: 0.2649 - mse: 0.2540
- rmse: 0.5040 - mae: 0.2649 - mape: 8.1842
Epoch 328: val_loss improved from 0.25842 to 0.25829, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2653 - mse:
0.2527 - rmse: 0.5027 - mae: 0.2653 - mape: 8.1933 - val_loss: 0.2583 - val_mse:
0.2473 - val_rmse: 0.4973 - val_mae: 0.2583 - val_mape: 8.0409 - lr: 0.0010
Epoch 329/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2667 - mse: 0.2539
- rmse: 0.5038 - mae: 0.2667 - mape: 8.2391
Epoch 329: val_loss did not improve from 0.25829
318/318 [=====] - 1s 2ms/step - loss: 0.2661 - mse:

0.2533 - rmse: 0.5033 - mae: 0.2661 - mape: 8.2357 - val_loss: 0.2672 - val_mse:
0.2565 - val_rmse: 0.5064 - val_mae: 0.2672 - val_mape: 8.0065 - lr: 0.0010
Epoch 330/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2695 - mse: 0.2605
- rmse: 0.5104 - mae: 0.2695 - mape: 8.3156
Epoch 330: val_loss did not improve from 0.25829
318/318 [=====] - 0s 2ms/step - loss: 0.2708 - mse:
0.2630 - rmse: 0.5129 - mae: 0.2708 - mape: 8.3438 - val_loss: 0.2587 - val_mse:
0.2378 - val_rmse: 0.4877 - val_mae: 0.2587 - val_mape: 8.0844 - lr: 0.0010
Epoch 331/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2724 - mse: 0.2593
- rmse: 0.5092 - mae: 0.2724 - mape: 8.3971
Epoch 331: val_loss did not improve from 0.25829
318/318 [=====] - 1s 2ms/step - loss: 0.2735 - mse:
0.2619 - rmse: 0.5117 - mae: 0.2735 - mape: 8.4663 - val_loss: 0.2647 - val_mse:
0.2408 - val_rmse: 0.4907 - val_mae: 0.2647 - val_mape: 8.0975 - lr: 0.0010
Epoch 332/2000
272/318 [=====>...] - ETA: 0s - loss: 0.2671 - mse: 0.2534
- rmse: 0.5034 - mae: 0.2671 - mape: 8.2633
Epoch 332: val_loss did not improve from 0.25829
318/318 [=====] - 0s 2ms/step - loss: 0.2665 - mse:
0.2522 - rmse: 0.5022 - mae: 0.2665 - mape: 8.2366 - val_loss: 0.2653 - val_mse:
0.2515 - val_rmse: 0.5015 - val_mae: 0.2653 - val_mape: 8.4501 - lr: 0.0010
Epoch 333/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2656 - mse: 0.2532
- rmse: 0.5032 - mae: 0.2656 - mape: 8.1531
Epoch 333: val_loss did not improve from 0.25829
318/318 [=====] - 0s 1ms/step - loss: 0.2662 - mse:
0.2539 - rmse: 0.5039 - mae: 0.2662 - mape: 8.1825 - val_loss: 0.2968 - val_mse:
0.3213 - val_rmse: 0.5668 - val_mae: 0.2968 - val_mape: 9.8302 - lr: 0.0010
Epoch 334/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2669 - mse: 0.2582
- rmse: 0.5082 - mae: 0.2669 - mape: 8.2298
Epoch 334: val_loss did not improve from 0.25829
318/318 [=====] - 1s 2ms/step - loss: 0.2666 - mse:
0.2585 - rmse: 0.5084 - mae: 0.2666 - mape: 8.2207 - val_loss: 0.2645 - val_mse:
0.2539 - val_rmse: 0.5039 - val_mae: 0.2645 - val_mape: 7.9109 - lr: 0.0010
Epoch 335/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2656 - mse: 0.2512
- rmse: 0.5012 - mae: 0.2656 - mape: 8.1731
Epoch 335: val_loss did not improve from 0.25829
318/318 [=====] - 0s 1ms/step - loss: 0.2660 - mse:
0.2520 - rmse: 0.5020 - mae: 0.2660 - mape: 8.1968 - val_loss: 0.2603 - val_mse:
0.2425 - val_rmse: 0.4925 - val_mae: 0.2603 - val_mape: 8.1058 - lr: 0.0010
Epoch 336/2000
273/318 [=====>...] - ETA: 0s - loss: 0.2636 - mse: 0.2515
- rmse: 0.5015 - mae: 0.2636 - mape: 8.0999
Epoch 336: val_loss did not improve from 0.25829

318/318 [=====] - 0s 1ms/step - loss: 0.2646 - mse: 0.2541 - rmse: 0.5041 - mae: 0.2646 - mape: 8.1382 - val_loss: 0.2657 - val_mse: 0.2424 - val_rmse: 0.4924 - val_mae: 0.2657 - val_mape: 8.2604 - lr: 0.0010
Epoch 337/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2668 - mse: 0.2563 - rmse: 0.5062 - mae: 0.2668 - mape: 8.2543
Epoch 337: val_loss did not improve from 0.25829
318/318 [=====] - 0s 2ms/step - loss: 0.2661 - mse: 0.2538 - rmse: 0.5038 - mae: 0.2661 - mape: 8.2483 - val_loss: 0.2637 - val_mse: 0.2507 - val_rmse: 0.5007 - val_mae: 0.2637 - val_mape: 7.9065 - lr: 0.0010
Epoch 338/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2652 - mse: 0.2514 - rmse: 0.5014 - mae: 0.2652 - mape: 8.2085
Epoch 338: val_loss did not improve from 0.25829
318/318 [=====] - 0s 1ms/step - loss: 0.2667 - mse: 0.2539 - rmse: 0.5039 - mae: 0.2667 - mape: 8.2536 - val_loss: 0.2605 - val_mse: 0.2458 - val_rmse: 0.4958 - val_mae: 0.2605 - val_mape: 8.0266 - lr: 0.0010
Epoch 339/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2664 - mse: 0.2518 - rmse: 0.5018 - mae: 0.2664 - mape: 8.2368
Epoch 339: val_loss did not improve from 0.25829
318/318 [=====] - 0s 1ms/step - loss: 0.2664 - mse: 0.2523 - rmse: 0.5023 - mae: 0.2664 - mape: 8.2508 - val_loss: 0.2588 - val_mse: 0.2433 - val_rmse: 0.4932 - val_mae: 0.2588 - val_mape: 8.0040 - lr: 0.0010
Epoch 340/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2693 - mse: 0.2560 - rmse: 0.5060 - mae: 0.2693 - mape: 8.3144
Epoch 340: val_loss improved from 0.25829 to 0.25813, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2687 - mse: 0.2549 - rmse: 0.5049 - mae: 0.2687 - mape: 8.3045 - val_loss: 0.2581 - val_mse: 0.2454 - val_rmse: 0.4954 - val_mae: 0.2581 - val_mape: 7.9412 - lr: 0.0010
Epoch 341/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2684 - mse: 0.2583 - rmse: 0.5082 - mae: 0.2684 - mape: 8.3067
Epoch 341: val_loss did not improve from 0.25813
318/318 [=====] - 0s 1ms/step - loss: 0.2684 - mse: 0.2591 - rmse: 0.5090 - mae: 0.2684 - mape: 8.3053 - val_loss: 0.2748 - val_mse: 0.2601 - val_rmse: 0.5100 - val_mae: 0.2748 - val_mape: 8.1179 - lr: 0.0010
Epoch 342/2000
298/318 [=====>..] - ETA: 0s - loss: 0.2682 - mse: 0.2560 - rmse: 0.5060 - mae: 0.2682 - mape: 8.2546
Epoch 342: val_loss did not improve from 0.25813
318/318 [=====] - 1s 2ms/step - loss: 0.2684 - mse: 0.2566 - rmse: 0.5066 - mae: 0.2684 - mape: 8.2601 - val_loss: 0.2603 - val_mse: 0.2448 - val_rmse: 0.4948 - val_mae: 0.2603 - val_mape: 7.8566 - lr: 0.0010
Epoch 343/2000
308/318 [=====>..] - ETA: 0s - loss: 0.2642 - mse: 0.2497

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- rmse: 0.4997 - mae: 0.2642 - mape: 8.1883
Epoch 343: val_loss did not improve from 0.25813
318/318 [=====] - 1s 2ms/step - loss: 0.2647 - mse:
0.2504 - rmse: 0.5004 - mae: 0.2647 - mape: 8.2070 - val_loss: 0.2649 - val_mse:
0.2516 - val_rmse: 0.5016 - val_mae: 0.2649 - val_mape: 7.9399 - lr: 0.0010
Epoch 344/2000
318/318 [=====] - ETA: 0s - loss: 0.2667 - mse: 0.2548
- rmse: 0.5048 - mae: 0.2667 - mape: 8.2694
Epoch 344: val_loss did not improve from 0.25813
318/318 [=====] - 0s 2ms/step - loss: 0.2667 - mse:
0.2548 - rmse: 0.5048 - mae: 0.2667 - mape: 8.2694 - val_loss: 0.2751 - val_mse:
0.2610 - val_rmse: 0.5109 - val_mae: 0.2751 - val_mape: 8.1429 - lr: 0.0010
Epoch 345/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2669 - mse: 0.2574
- rmse: 0.5073 - mae: 0.2669 - mape: 8.2635
Epoch 345: val_loss did not improve from 0.25813
318/318 [=====] - 0s 2ms/step - loss: 0.2680 - mse:
0.2590 - rmse: 0.5089 - mae: 0.2680 - mape: 8.2824 - val_loss: 0.2658 - val_mse:
0.2379 - val_rmse: 0.4878 - val_mae: 0.2658 - val_mape: 8.1566 - lr: 0.0010
Epoch 346/2000
318/318 [=====] - ETA: 0s - loss: 0.2651 - mse: 0.2523
- rmse: 0.5023 - mae: 0.2651 - mape: 8.1954
Epoch 346: val_loss did not improve from 0.25813
318/318 [=====] - 1s 2ms/step - loss: 0.2651 - mse:
0.2523 - rmse: 0.5023 - mae: 0.2651 - mape: 8.1954 - val_loss: 0.2603 - val_mse:
0.2448 - val_rmse: 0.4948 - val_mae: 0.2603 - val_mape: 8.1777 - lr: 0.0010
Epoch 347/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2663 - mse: 0.2534
- rmse: 0.5034 - mae: 0.2663 - mape: 8.2803
Epoch 347: val_loss did not improve from 0.25813
318/318 [=====] - 0s 2ms/step - loss: 0.2667 - mse:
0.2536 - rmse: 0.5036 - mae: 0.2667 - mape: 8.2808 - val_loss: 0.2595 - val_mse:
0.2454 - val_rmse: 0.4954 - val_mae: 0.2595 - val_mape: 8.2001 - lr: 0.0010
Epoch 348/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2687 - mse: 0.2623
- rmse: 0.5121 - mae: 0.2687 - mape: 8.3101
Epoch 348: val_loss did not improve from 0.25813
318/318 [=====] - 1s 2ms/step - loss: 0.2684 - mse:
0.2616 - rmse: 0.5115 - mae: 0.2684 - mape: 8.2996 - val_loss: 0.2963 - val_mse:
0.3181 - val_rmse: 0.5640 - val_mae: 0.2963 - val_mape: 9.7327 - lr: 0.0010
Epoch 349/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2652 - mse: 0.2553
- rmse: 0.5053 - mae: 0.2652 - mape: 8.1660
Epoch 349: val_loss did not improve from 0.25813
318/318 [=====] - 0s 2ms/step - loss: 0.2655 - mse:
0.2560 - rmse: 0.5060 - mae: 0.2655 - mape: 8.1787 - val_loss: 0.2878 - val_mse:
0.2939 - val_rmse: 0.5421 - val_mae: 0.2878 - val_mape: 9.4475 - lr: 0.0010
Epoch 350/2000

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312/318 [=====>.] - ETA: 0s - loss: 0.2654 - mse: 0.2560
- rmse: 0.5060 - mae: 0.2654 - mape: 8.2241
Epoch 350: val_loss did not improve from 0.25813
318/318 [=====] - 0s 2ms/step - loss: 0.2654 - mse:
0.2562 - rmse: 0.5062 - mae: 0.2654 - mape: 8.2259 - val_loss: 0.2704 - val_mse:
0.2582 - val_rmse: 0.5082 - val_mae: 0.2704 - val_mape: 8.7026 - lr: 0.0010
Epoch 351/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2676 - mse: 0.2574
- rmse: 0.5074 - mae: 0.2676 - mape: 8.2743
Epoch 351: val_loss did not improve from 0.25813
318/318 [=====] - 1s 2ms/step - loss: 0.2676 - mse:
0.2588 - rmse: 0.5087 - mae: 0.2676 - mape: 8.2575 - val_loss: 0.2625 - val_mse:
0.2514 - val_rmse: 0.5014 - val_mae: 0.2625 - val_mape: 8.3213 - lr: 0.0010
Epoch 352/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2641 - mse: 0.2533
- rmse: 0.5033 - mae: 0.2641 - mape: 8.1826
Epoch 352: val_loss improved from 0.25813 to 0.25744, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2660 - mse:
0.2555 - rmse: 0.5054 - mae: 0.2660 - mape: 8.2404 - val_loss: 0.2574 - val_mse:
0.2441 - val_rmse: 0.4941 - val_mae: 0.2574 - val_mape: 7.9901 - lr: 0.0010
Epoch 353/2000
264/318 [=====>...] - ETA: 0s - loss: 0.2677 - mse: 0.2599
- rmse: 0.5098 - mae: 0.2677 - mape: 8.2453
Epoch 353: val_loss did not improve from 0.25744
318/318 [=====] - 0s 1ms/step - loss: 0.2682 - mse:
0.2599 - rmse: 0.5098 - mae: 0.2682 - mape: 8.2799 - val_loss: 0.2606 - val_mse:
0.2484 - val_rmse: 0.4984 - val_mae: 0.2606 - val_mape: 8.1841 - lr: 0.0010
Epoch 354/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2718 - mse: 0.2610
- rmse: 0.5109 - mae: 0.2718 - mape: 8.4354
Epoch 354: val_loss did not improve from 0.25744
318/318 [=====] - 0s 1ms/step - loss: 0.2725 - mse:
0.2613 - rmse: 0.5111 - mae: 0.2725 - mape: 8.4473 - val_loss: 0.2702 - val_mse:
0.2697 - val_rmse: 0.5193 - val_mae: 0.2702 - val_mape: 8.7229 - lr: 0.0010
Epoch 355/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2670 - mse: 0.2559
- rmse: 0.5059 - mae: 0.2670 - mape: 8.2782
Epoch 355: val_loss did not improve from 0.25744
318/318 [=====] - 0s 2ms/step - loss: 0.2661 - mse:
0.2539 - rmse: 0.5039 - mae: 0.2661 - mape: 8.2445 - val_loss: 0.2680 - val_mse:
0.2596 - val_rmse: 0.5096 - val_mae: 0.2680 - val_mape: 8.6279 - lr: 0.0010
Epoch 356/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2663 - mse: 0.2577
- rmse: 0.5076 - mae: 0.2663 - mape: 8.2125
Epoch 356: val_loss did not improve from 0.25744
318/318 [=====] - 0s 1ms/step - loss: 0.2651 - mse:
0.2556 - rmse: 0.5056 - mae: 0.2651 - mape: 8.1735 - val_loss: 0.2599 - val_mse:

0.2473 - val_rmse: 0.4973 - val_mae: 0.2599 - val_mape: 8.1699 - lr: 0.0010
Epoch 357/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2631 - mse: 0.2519
- rmse: 0.5019 - mae: 0.2631 - mape: 8.1110
Epoch 357: val_loss did not improve from 0.25744
318/318 [=====] - 0s 1ms/step - loss: 0.2639 - mse:
0.2507 - rmse: 0.5007 - mae: 0.2639 - mape: 8.1584 - val_loss: 0.3139 - val_mse:
0.3629 - val_rmse: 0.6024 - val_mae: 0.3139 - val_mape: 8.7687 - lr: 0.0010
Epoch 358/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2748 - mse: 0.2711
- rmse: 0.5206 - mae: 0.2748 - mape: 8.4572
Epoch 358: val_loss did not improve from 0.25744
318/318 [=====] - 0s 2ms/step - loss: 0.2740 - mse:
0.2700 - rmse: 0.5196 - mae: 0.2740 - mape: 8.4348 - val_loss: 0.2665 - val_mse:
0.2501 - val_rmse: 0.5001 - val_mae: 0.2665 - val_mape: 8.4645 - lr: 0.0010
Epoch 359/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2658 - mse: 0.2545
- rmse: 0.5044 - mae: 0.2658 - mape: 8.2016
Epoch 359: val_loss did not improve from 0.25744
318/318 [=====] - 0s 1ms/step - loss: 0.2643 - mse:
0.2514 - rmse: 0.5014 - mae: 0.2643 - mape: 8.1427 - val_loss: 0.2842 - val_mse:
0.2864 - val_rmse: 0.5352 - val_mae: 0.2842 - val_mape: 8.2349 - lr: 0.0010
Epoch 360/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2634 - mse: 0.2516
- rmse: 0.5016 - mae: 0.2634 - mape: 8.1448
Epoch 360: val_loss did not improve from 0.25744
318/318 [=====] - 0s 1ms/step - loss: 0.2629 - mse:
0.2509 - rmse: 0.5009 - mae: 0.2629 - mape: 8.1334 - val_loss: 0.2586 - val_mse:
0.2421 - val_rmse: 0.4920 - val_mae: 0.2586 - val_mape: 8.0515 - lr: 0.0010
Epoch 361/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2684 - mse: 0.2606
- rmse: 0.5105 - mae: 0.2684 - mape: 8.2912
Epoch 361: val_loss did not improve from 0.25744
318/318 [=====] - 0s 2ms/step - loss: 0.2674 - mse:
0.2598 - rmse: 0.5097 - mae: 0.2674 - mape: 8.2708 - val_loss: 0.2707 - val_mse:
0.2476 - val_rmse: 0.4976 - val_mae: 0.2707 - val_mape: 8.1509 - lr: 0.0010
Epoch 362/2000
318/318 [=====] - ETA: 0s - loss: 0.2645 - mse: 0.2514
- rmse: 0.5014 - mae: 0.2645 - mape: 8.1499
Epoch 362: val_loss did not improve from 0.25744
318/318 [=====] - 0s 2ms/step - loss: 0.2645 - mse:
0.2514 - rmse: 0.5014 - mae: 0.2645 - mape: 8.1499 - val_loss: 0.2576 - val_mse:
0.2454 - val_rmse: 0.4954 - val_mae: 0.2576 - val_mape: 8.1071 - lr: 0.0010
Epoch 363/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2639 - mse: 0.2538
- rmse: 0.5038 - mae: 0.2639 - mape: 8.1519
Epoch 363: val_loss did not improve from 0.25744
318/318 [=====] - 0s 2ms/step - loss: 0.2647 - mse:

0.2545 - rmse: 0.5045 - mae: 0.2647 - mape: 8.1787 - val_loss: 0.2576 - val_mse:
0.2405 - val_rmse: 0.4904 - val_mae: 0.2576 - val_mape: 8.0213 - lr: 0.0010
Epoch 364/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2692 - mse: 0.2626
- rmse: 0.5124 - mae: 0.2692 - mape: 8.2581
Epoch 364: val_loss did not improve from 0.25744
318/318 [=====] - 1s 2ms/step - loss: 0.2687 - mse:
0.2617 - rmse: 0.5116 - mae: 0.2687 - mape: 8.2355 - val_loss: 0.2753 - val_mse:
0.2824 - val_rmse: 0.5314 - val_mae: 0.2753 - val_mape: 8.9146 - lr: 0.0010
Epoch 365/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2674 - mse: 0.2578
- rmse: 0.5077 - mae: 0.2674 - mape: 8.2347
Epoch 365: val_loss did not improve from 0.25744
318/318 [=====] - 0s 2ms/step - loss: 0.2674 - mse:
0.2576 - rmse: 0.5075 - mae: 0.2674 - mape: 8.2353 - val_loss: 0.2605 - val_mse:
0.2446 - val_rmse: 0.4945 - val_mae: 0.2605 - val_mape: 8.3002 - lr: 0.0010
Epoch 366/2000
272/318 [=====>...] - ETA: 0s - loss: 0.2671 - mse: 0.2525
- rmse: 0.5025 - mae: 0.2671 - mape: 8.2550
Epoch 366: val_loss did not improve from 0.25744
318/318 [=====] - 1s 2ms/step - loss: 0.2674 - mse:
0.2552 - rmse: 0.5051 - mae: 0.2674 - mape: 8.2698 - val_loss: 0.2588 - val_mse:
0.2405 - val_rmse: 0.4904 - val_mae: 0.2588 - val_mape: 8.0216 - lr: 0.0010
Epoch 367/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2653 - mse: 0.2523
- rmse: 0.5023 - mae: 0.2653 - mape: 8.1891
Epoch 367: val_loss did not improve from 0.25744
318/318 [=====] - 0s 2ms/step - loss: 0.2648 - mse:
0.2513 - rmse: 0.5013 - mae: 0.2648 - mape: 8.1784 - val_loss: 0.2627 - val_mse:
0.2436 - val_rmse: 0.4936 - val_mae: 0.2627 - val_mape: 8.0209 - lr: 0.0010
Epoch 368/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2672 - mse: 0.2564
- rmse: 0.5064 - mae: 0.2672 - mape: 8.2674
Epoch 368: val_loss did not improve from 0.25744
318/318 [=====] - 0s 2ms/step - loss: 0.2672 - mse:
0.2564 - rmse: 0.5064 - mae: 0.2672 - mape: 8.2685 - val_loss: 0.2996 - val_mse:
0.3225 - val_rmse: 0.5679 - val_mae: 0.2996 - val_mape: 9.5393 - lr: 0.0010
Epoch 369/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2658 - mse: 0.2538
- rmse: 0.5037 - mae: 0.2658 - mape: 8.1959
Epoch 369: val_loss did not improve from 0.25744
318/318 [=====] - 1s 2ms/step - loss: 0.2649 - mse:
0.2529 - rmse: 0.5028 - mae: 0.2649 - mape: 8.1746 - val_loss: 0.2628 - val_mse:
0.2443 - val_rmse: 0.4942 - val_mae: 0.2628 - val_mape: 8.3731 - lr: 0.0010
Epoch 370/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2648 - mse: 0.2507
- rmse: 0.5007 - mae: 0.2648 - mape: 8.1802
Epoch 370: val_loss did not improve from 0.25744

318/318 [=====] - 0s 2ms/step - loss: 0.2646 - mse: 0.2501 - rmse: 0.5001 - mae: 0.2646 - mape: 8.1738 - val_loss: 0.2782 - val_mse: 0.2791 - val_rmse: 0.5283 - val_mae: 0.2782 - val_mape: 9.0072 - lr: 0.0010
Epoch 371/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2669 - mse: 0.2576 - rmse: 0.5075 - mae: 0.2669 - mape: 8.2733
Epoch 371: val_loss did not improve from 0.25744
318/318 [=====] - 0s 2ms/step - loss: 0.2663 - mse: 0.2563 - rmse: 0.5062 - mae: 0.2663 - mape: 8.2506 - val_loss: 0.2597 - val_mse: 0.2455 - val_rmse: 0.4955 - val_mae: 0.2597 - val_mape: 7.8957 - lr: 0.0010
Epoch 372/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2668 - mse: 0.2549 - rmse: 0.5049 - mae: 0.2668 - mape: 8.2363
Epoch 372: val_loss improved from 0.25744 to 0.25634, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2662 - mse: 0.2540 - rmse: 0.5040 - mae: 0.2662 - mape: 8.2171 - val_loss: 0.2563 - val_mse: 0.2415 - val_rmse: 0.4914 - val_mae: 0.2563 - val_mape: 7.9585 - lr: 0.0010
Epoch 373/2000
273/318 [=====>...] - ETA: 0s - loss: 0.2736 - mse: 0.2656 - rmse: 0.5154 - mae: 0.2736 - mape: 8.4879
Epoch 373: val_loss did not improve from 0.25634
318/318 [=====] - 0s 1ms/step - loss: 0.2703 - mse: 0.2602 - rmse: 0.5101 - mae: 0.2703 - mape: 8.3629 - val_loss: 0.2695 - val_mse: 0.2642 - val_rmse: 0.5140 - val_mae: 0.2695 - val_mape: 8.0560 - lr: 0.0010
Epoch 374/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2706 - mse: 0.2656 - rmse: 0.5153 - mae: 0.2706 - mape: 8.4018
Epoch 374: val_loss did not improve from 0.25634
318/318 [=====] - 0s 1ms/step - loss: 0.2697 - mse: 0.2630 - rmse: 0.5129 - mae: 0.2697 - mape: 8.3695 - val_loss: 0.2630 - val_mse: 0.2502 - val_rmse: 0.5002 - val_mae: 0.2630 - val_mape: 8.3028 - lr: 0.0010
Epoch 375/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2618 - mse: 0.2485 - rmse: 0.4985 - mae: 0.2618 - mape: 8.0609
Epoch 375: val_loss did not improve from 0.25634
318/318 [=====] - 1s 2ms/step - loss: 0.2630 - mse: 0.2504 - rmse: 0.5004 - mae: 0.2630 - mape: 8.0860 - val_loss: 0.2636 - val_mse: 0.2572 - val_rmse: 0.5072 - val_mae: 0.2636 - val_mape: 7.7604 - lr: 0.0010
Epoch 376/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2665 - mse: 0.2526 - rmse: 0.5026 - mae: 0.2665 - mape: 8.2196
Epoch 376: val_loss did not improve from 0.25634
318/318 [=====] - 0s 1ms/step - loss: 0.2656 - mse: 0.2523 - rmse: 0.5023 - mae: 0.2656 - mape: 8.2197 - val_loss: 0.2587 - val_mse: 0.2467 - val_rmse: 0.4967 - val_mae: 0.2587 - val_mape: 7.8926 - lr: 0.0010
Epoch 377/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2633 - mse: 0.2471


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- rmse: 0.4971 - mae: 0.2633 - mape: 8.1417
Epoch 377: val_loss did not improve from 0.25634
318/318 [=====] - 0s 1ms/step - loss: 0.2636 - mse:
0.2488 - rmse: 0.4988 - mae: 0.2636 - mape: 8.1387 - val_loss: 0.2608 - val_mse:
0.2474 - val_rmse: 0.4974 - val_mae: 0.2608 - val_mape: 8.1849 - lr: 0.0010
Epoch 378/2000
264/318 [=====>...] - ETA: 0s - loss: 0.2640 - mse: 0.2518
- rmse: 0.5018 - mae: 0.2640 - mape: 8.1836
Epoch 378: val_loss did not improve from 0.25634
318/318 [=====] - 1s 2ms/step - loss: 0.2639 - mse:
0.2512 - rmse: 0.5012 - mae: 0.2639 - mape: 8.1771 - val_loss: 0.2691 - val_mse:
0.2525 - val_rmse: 0.5024 - val_mae: 0.2691 - val_mape: 8.1383 - lr: 0.0010
Epoch 379/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2659 - mse: 0.2552
- rmse: 0.5052 - mae: 0.2659 - mape: 8.1769
Epoch 379: val_loss did not improve from 0.25634
318/318 [=====] - 0s 1ms/step - loss: 0.2648 - mse:
0.2532 - rmse: 0.5032 - mae: 0.2648 - mape: 8.1443 - val_loss: 0.2639 - val_mse:
0.2532 - val_rmse: 0.5032 - val_mae: 0.2639 - val_mape: 8.3920 - lr: 0.0010
Epoch 380/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2685 - mse: 0.2580
- rmse: 0.5080 - mae: 0.2685 - mape: 8.3252
Epoch 380: val_loss did not improve from 0.25634
318/318 [=====] - 0s 2ms/step - loss: 0.2678 - mse:
0.2570 - rmse: 0.5070 - mae: 0.2678 - mape: 8.3023 - val_loss: 0.2680 - val_mse:
0.2553 - val_rmse: 0.5052 - val_mae: 0.2680 - val_mape: 8.5420 - lr: 0.0010
Epoch 381/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2646 - mse: 0.2517
- rmse: 0.5017 - mae: 0.2646 - mape: 8.1593
Epoch 381: val_loss did not improve from 0.25634
318/318 [=====] - 0s 1ms/step - loss: 0.2635 - mse:
0.2499 - rmse: 0.4999 - mae: 0.2635 - mape: 8.1221 - val_loss: 0.2590 - val_mse:
0.2517 - val_rmse: 0.5017 - val_mae: 0.2590 - val_mape: 8.1417 - lr: 0.0010
Epoch 382/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2642 - mse: 0.2539
- rmse: 0.5038 - mae: 0.2642 - mape: 8.1365
Epoch 382: val_loss did not improve from 0.25634
318/318 [=====] - 0s 1ms/step - loss: 0.2657 - mse:
0.2579 - rmse: 0.5078 - mae: 0.2657 - mape: 8.1631 - val_loss: 0.2658 - val_mse:
0.2571 - val_rmse: 0.5071 - val_mae: 0.2658 - val_mape: 8.4444 - lr: 0.0010
Epoch 383/2000
318/318 [=====] - ETA: 0s - loss: 0.2655 - mse: 0.2537
- rmse: 0.5037 - mae: 0.2655 - mape: 8.2035
Epoch 383: val_loss did not improve from 0.25634
318/318 [=====] - 1s 2ms/step - loss: 0.2655 - mse:
0.2537 - rmse: 0.5037 - mae: 0.2655 - mape: 8.2035 - val_loss: 0.2595 - val_mse:
0.2519 - val_rmse: 0.5019 - val_mae: 0.2595 - val_mape: 8.1450 - lr: 0.0010
Epoch 384/2000

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314/318 [=====>.] - ETA: 0s - loss: 0.2695 - mse: 0.2623
- rmse: 0.5121 - mae: 0.2695 - mape: 8.3390
Epoch 384: val_loss did not improve from 0.25634
318/318 [=====] - 0s 2ms/step - loss: 0.2691 - mse:
0.2614 - rmse: 0.5112 - mae: 0.2691 - mape: 8.3271 - val_loss: 0.2623 - val_mse:
0.2534 - val_rmse: 0.5034 - val_mae: 0.2623 - val_mape: 8.2809 - lr: 0.0010
Epoch 385/2000
272/318 [=====>...] - ETA: 0s - loss: 0.2659 - mse: 0.2586
- rmse: 0.5085 - mae: 0.2659 - mape: 8.2163
Epoch 385: val_loss did not improve from 0.25634
318/318 [=====] - 0s 1ms/step - loss: 0.2656 - mse:
0.2563 - rmse: 0.5062 - mae: 0.2656 - mape: 8.1752 - val_loss: 0.2635 - val_mse:
0.2571 - val_rmse: 0.5070 - val_mae: 0.2635 - val_mape: 7.9102 - lr: 0.0010
Epoch 386/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2622 - mse: 0.2519
- rmse: 0.5019 - mae: 0.2622 - mape: 8.1071
Epoch 386: val_loss did not improve from 0.25634
318/318 [=====] - 1s 2ms/step - loss: 0.2628 - mse:
0.2533 - rmse: 0.5033 - mae: 0.2628 - mape: 8.1324 - val_loss: 0.2705 - val_mse:
0.2661 - val_rmse: 0.5158 - val_mae: 0.2705 - val_mape: 7.9372 - lr: 0.0010
Epoch 387/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2632 - mse: 0.2502
- rmse: 0.5002 - mae: 0.2632 - mape: 8.1213
Epoch 387: val_loss did not improve from 0.25634
318/318 [=====] - 0s 2ms/step - loss: 0.2627 - mse:
0.2494 - rmse: 0.4994 - mae: 0.2627 - mape: 8.1075 - val_loss: 0.2564 - val_mse:
0.2450 - val_rmse: 0.4949 - val_mae: 0.2564 - val_mape: 8.0254 - lr: 0.0010
Epoch 388/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2647 - mse: 0.2530
- rmse: 0.5030 - mae: 0.2647 - mape: 8.1744
Epoch 388: val_loss did not improve from 0.25634
318/318 [=====] - 0s 2ms/step - loss: 0.2646 - mse:
0.2533 - rmse: 0.5033 - mae: 0.2646 - mape: 8.1627 - val_loss: 0.2589 - val_mse:
0.2457 - val_rmse: 0.4957 - val_mae: 0.2589 - val_mape: 8.1183 - lr: 0.0010
Epoch 389/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2632 - mse: 0.2523
- rmse: 0.5023 - mae: 0.2632 - mape: 8.1426
Epoch 389: val_loss did not improve from 0.25634
318/318 [=====] - 0s 2ms/step - loss: 0.2630 - mse:
0.2512 - rmse: 0.5012 - mae: 0.2630 - mape: 8.1329 - val_loss: 0.2643 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2643 - val_mape: 8.3110 - lr: 0.0010
Epoch 390/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2642 - mse: 0.2502
- rmse: 0.5002 - mae: 0.2642 - mape: 8.1857
Epoch 390: val_loss did not improve from 0.25634
318/318 [=====] - 0s 2ms/step - loss: 0.2646 - mse:
0.2514 - rmse: 0.5014 - mae: 0.2646 - mape: 8.2051 - val_loss: 0.2780 - val_mse:
0.2729 - val_rmse: 0.5224 - val_mae: 0.2780 - val_mape: 8.1424 - lr: 0.0010

Epoch 391/2000
306/318 [=====>...] - ETA: 0s - loss: 0.2668 - mse: 0.2564
- rmse: 0.5064 - mae: 0.2668 - mape: 8.2482
Epoch 391: val_loss did not improve from 0.25634
318/318 [=====] - 1s 2ms/step - loss: 0.2659 - mse:
0.2544 - rmse: 0.5044 - mae: 0.2659 - mape: 8.2258 - val_loss: 0.2601 - val_mse:
0.2386 - val_rmse: 0.4884 - val_mae: 0.2601 - val_mape: 7.9839 - lr: 0.0010
Epoch 392/2000
305/318 [=====>...] - ETA: 0s - loss: 0.2653 - mse: 0.2575
- rmse: 0.5075 - mae: 0.2653 - mape: 8.1742
Epoch 392: val_loss did not improve from 0.25634
318/318 [=====] - 0s 2ms/step - loss: 0.2670 - mse:
0.2603 - rmse: 0.5102 - mae: 0.2670 - mape: 8.2148 - val_loss: 0.3607 - val_mse:
0.4492 - val_rmse: 0.6703 - val_mae: 0.3607 - val_mape: 10.1177 - lr: 0.0010
Epoch 393/2000
306/318 [=====>...] - ETA: 0s - loss: 0.2651 - mse: 0.2546
- rmse: 0.5046 - mae: 0.2651 - mape: 8.2091
Epoch 393: val_loss did not improve from 0.25634
318/318 [=====] - 0s 2ms/step - loss: 0.2656 - mse:
0.2551 - rmse: 0.5050 - mae: 0.2656 - mape: 8.2165 - val_loss: 0.2608 - val_mse:
0.2416 - val_rmse: 0.4915 - val_mae: 0.2608 - val_mape: 7.9598 - lr: 0.0010
Epoch 394/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2648 - mse: 0.2536
- rmse: 0.5036 - mae: 0.2648 - mape: 8.1475
Epoch 394: val_loss did not improve from 0.25634
318/318 [=====] - 0s 1ms/step - loss: 0.2647 - mse:
0.2549 - rmse: 0.5049 - mae: 0.2647 - mape: 8.1481 - val_loss: 0.2577 - val_mse:
0.2409 - val_rmse: 0.4909 - val_mae: 0.2577 - val_mape: 8.0376 - lr: 0.0010
Epoch 395/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2631 - mse: 0.2507
- rmse: 0.5007 - mae: 0.2631 - mape: 8.1381
Epoch 395: val_loss improved from 0.25634 to 0.25607, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2626 - mse:
0.2501 - rmse: 0.5001 - mae: 0.2626 - mape: 8.1214 - val_loss: 0.2561 - val_mse:
0.2435 - val_rmse: 0.4935 - val_mae: 0.2561 - val_mape: 7.8700 - lr: 0.0010
Epoch 396/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2634 - mse: 0.2530
- rmse: 0.5029 - mae: 0.2634 - mape: 8.1538
Epoch 396: val_loss did not improve from 0.25607
318/318 [=====] - 1s 2ms/step - loss: 0.2639 - mse:
0.2530 - rmse: 0.5030 - mae: 0.2639 - mape: 8.1560 - val_loss: 0.2738 - val_mse:
0.2702 - val_rmse: 0.5198 - val_mae: 0.2738 - val_mape: 8.7726 - lr: 0.0010
Epoch 397/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2652 - mse: 0.2570
- rmse: 0.5070 - mae: 0.2652 - mape: 8.1451
Epoch 397: val_loss did not improve from 0.25607
318/318 [=====] - 0s 1ms/step - loss: 0.2662 - mse:

0.2563 - rmse: 0.5062 - mae: 0.2662 - mape: 8.1728 - val_loss: 0.2685 - val_mse:
0.2390 - val_rmse: 0.4889 - val_mae: 0.2685 - val_mape: 8.5347 - lr: 0.0010
Epoch 398/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2657 - mse: 0.2537
- rmse: 0.5037 - mae: 0.2657 - mape: 8.2139
Epoch 398: val_loss did not improve from 0.25607
318/318 [=====] - 0s 2ms/step - loss: 0.2643 - mse:
0.2511 - rmse: 0.5011 - mae: 0.2643 - mape: 8.1744 - val_loss: 0.2573 - val_mse:
0.2443 - val_rmse: 0.4943 - val_mae: 0.2573 - val_mape: 7.9766 - lr: 0.0010
Epoch 399/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2634 - mse: 0.2497
- rmse: 0.4997 - mae: 0.2634 - mape: 8.1718
Epoch 399: val_loss did not improve from 0.25607
318/318 [=====] - 0s 1ms/step - loss: 0.2652 - mse:
0.2542 - rmse: 0.5042 - mae: 0.2652 - mape: 8.2066 - val_loss: 0.2603 - val_mse:
0.2442 - val_rmse: 0.4942 - val_mae: 0.2603 - val_mape: 8.0027 - lr: 0.0010
Epoch 400/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2629 - mse: 0.2505
- rmse: 0.5005 - mae: 0.2629 - mape: 8.1187
Epoch 400: val_loss did not improve from 0.25607
318/318 [=====] - 0s 1ms/step - loss: 0.2641 - mse:
0.2524 - rmse: 0.5024 - mae: 0.2641 - mape: 8.1533 - val_loss: 0.2620 - val_mse:
0.2508 - val_rmse: 0.5008 - val_mae: 0.2620 - val_mape: 8.2585 - lr: 0.0010
Epoch 401/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2624 - mse: 0.2508
- rmse: 0.5008 - mae: 0.2624 - mape: 8.1526
Epoch 401: val_loss did not improve from 0.25607
318/318 [=====] - 0s 2ms/step - loss: 0.2619 - mse:
0.2491 - rmse: 0.4991 - mae: 0.2619 - mape: 8.1393 - val_loss: 0.2677 - val_mse:
0.2605 - val_rmse: 0.5104 - val_mae: 0.2677 - val_mape: 8.4315 - lr: 0.0010
Epoch 402/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2646 - mse: 0.2564
- rmse: 0.5064 - mae: 0.2646 - mape: 8.2123
Epoch 402: val_loss did not improve from 0.25607
318/318 [=====] - 0s 1ms/step - loss: 0.2644 - mse:
0.2544 - rmse: 0.5044 - mae: 0.2644 - mape: 8.1873 - val_loss: 0.2655 - val_mse:
0.2527 - val_rmse: 0.5026 - val_mae: 0.2655 - val_mape: 8.3066 - lr: 0.0010
Epoch 403/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2653 - mse: 0.2539
- rmse: 0.5038 - mae: 0.2653 - mape: 8.2074
Epoch 403: val_loss did not improve from 0.25607
318/318 [=====] - 0s 2ms/step - loss: 0.2652 - mse:
0.2536 - rmse: 0.5036 - mae: 0.2652 - mape: 8.2047 - val_loss: 0.2578 - val_mse:
0.2389 - val_rmse: 0.4888 - val_mae: 0.2578 - val_mape: 7.9026 - lr: 0.0010
Epoch 404/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2645 - mse: 0.2554
- rmse: 0.5054 - mae: 0.2645 - mape: 8.1562
Epoch 404: val_loss did not improve from 0.25607

318/318 [=====] - 1s 2ms/step - loss: 0.2651 - mse: 0.2567 - rmse: 0.5067 - mae: 0.2651 - mape: 8.1850 - val_loss: 0.2638 - val_mse: 0.2432 - val_rmse: 0.4932 - val_mae: 0.2638 - val_mape: 8.3262 - lr: 0.0010
Epoch 405/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2660 - mse: 0.2583 - rmse: 0.5082 - mae: 0.2660 - mape: 8.2551
Epoch 405: val_loss did not improve from 0.25607
318/318 [=====] - 0s 2ms/step - loss: 0.2661 - mse: 0.2582 - rmse: 0.5081 - mae: 0.2661 - mape: 8.2529 - val_loss: 0.2621 - val_mse: 0.2408 - val_rmse: 0.4908 - val_mae: 0.2621 - val_mape: 8.0980 - lr: 0.0010
Epoch 406/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2698 - mse: 0.2640 - rmse: 0.5138 - mae: 0.2698 - mape: 8.3453
Epoch 406: val_loss did not improve from 0.25607
318/318 [=====] - 1s 2ms/step - loss: 0.2695 - mse: 0.2635 - rmse: 0.5133 - mae: 0.2695 - mape: 8.3321 - val_loss: 0.2587 - val_mse: 0.2471 - val_rmse: 0.4971 - val_mae: 0.2587 - val_mape: 8.1802 - lr: 0.0010
Epoch 407/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2650 - mse: 0.2544 - rmse: 0.5044 - mae: 0.2650 - mape: 8.2195
Epoch 407: val_loss did not improve from 0.25607
318/318 [=====] - 0s 2ms/step - loss: 0.2645 - mse: 0.2545 - rmse: 0.5044 - mae: 0.2645 - mape: 8.2025 - val_loss: 0.2742 - val_mse: 0.2614 - val_rmse: 0.5112 - val_mae: 0.2742 - val_mape: 8.6825 - lr: 0.0010
Epoch 408/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2657 - mse: 0.2544 - rmse: 0.5044 - mae: 0.2657 - mape: 8.2296
Epoch 408: val_loss did not improve from 0.25607
318/318 [=====] - 0s 2ms/step - loss: 0.2644 - mse: 0.2520 - rmse: 0.5020 - mae: 0.2644 - mape: 8.1955 - val_loss: 0.2683 - val_mse: 0.2677 - val_rmse: 0.5174 - val_mae: 0.2683 - val_mape: 8.6893 - lr: 0.0010
Epoch 409/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2659 - mse: 0.2544 - rmse: 0.5044 - mae: 0.2659 - mape: 8.2002
Epoch 409: val_loss did not improve from 0.25607
318/318 [=====] - 1s 2ms/step - loss: 0.2652 - mse: 0.2529 - rmse: 0.5029 - mae: 0.2652 - mape: 8.1788 - val_loss: 0.2592 - val_mse: 0.2443 - val_rmse: 0.4943 - val_mae: 0.2592 - val_mape: 8.0171 - lr: 0.0010
Epoch 410/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2686 - mse: 0.2548 - rmse: 0.5048 - mae: 0.2686 - mape: 8.3324
Epoch 410: val_loss did not improve from 0.25607
318/318 [=====] - 1s 2ms/step - loss: 0.2687 - mse: 0.2553 - rmse: 0.5053 - mae: 0.2687 - mape: 8.3346 - val_loss: 0.2593 - val_mse: 0.2350 - val_rmse: 0.4848 - val_mae: 0.2593 - val_mape: 8.0060 - lr: 0.0010
Epoch 411/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2648 - mse: 0.2547 - rmse: 0.5046 - mae: 0.2648 - mape: 8.1804

Epoch 411: val_loss did not improve from 0.25607
318/318 [=====] - 1s 2ms/step - loss: 0.2646 - mse: 0.2540 - rmse: 0.5040 - mae: 0.2646 - mape: 8.1742 - val_loss: 0.2584 - val_mse: 0.2434 - val_rmse: 0.4934 - val_mae: 0.2584 - val_mape: 7.8167 - lr: 0.0010
Epoch 412/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2659 - mse: 0.2550 - rmse: 0.5050 - mae: 0.2659 - mape: 8.1716
Epoch 412: val_loss did not improve from 0.25607
318/318 [=====] - 1s 2ms/step - loss: 0.2666 - mse: 0.2563 - rmse: 0.5062 - mae: 0.2666 - mape: 8.1932 - val_loss: 0.2589 - val_mse: 0.2456 - val_rmse: 0.4956 - val_mae: 0.2589 - val_mape: 7.8951 - lr: 0.0010
Epoch 413/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2623 - mse: 0.2502 - rmse: 0.5002 - mae: 0.2623 - mape: 8.0921
Epoch 413: val_loss did not improve from 0.25607
318/318 [=====] - 1s 2ms/step - loss: 0.2621 - mse: 0.2501 - rmse: 0.5001 - mae: 0.2621 - mape: 8.0936 - val_loss: 0.2694 - val_mse: 0.2584 - val_rmse: 0.5084 - val_mae: 0.2694 - val_mape: 8.5026 - lr: 0.0010
Epoch 414/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2626 - mse: 0.2509 - rmse: 0.5009 - mae: 0.2626 - mape: 8.1322
Epoch 414: val_loss did not improve from 0.25607
318/318 [=====] - 0s 1ms/step - loss: 0.2634 - mse: 0.2517 - rmse: 0.5017 - mae: 0.2634 - mape: 8.1489 - val_loss: 0.2573 - val_mse: 0.2363 - val_rmse: 0.4861 - val_mae: 0.2573 - val_mape: 7.9118 - lr: 0.0010
Epoch 415/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2656 - mse: 0.2532 - rmse: 0.5032 - mae: 0.2656 - mape: 8.2116
Epoch 415: val_loss did not improve from 0.25607
318/318 [=====] - 0s 1ms/step - loss: 0.2646 - mse: 0.2521 - rmse: 0.5021 - mae: 0.2646 - mape: 8.2038 - val_loss: 0.2761 - val_mse: 0.2756 - val_rmse: 0.5250 - val_mae: 0.2761 - val_mape: 8.9008 - lr: 0.0010
Epoch 416/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2626 - mse: 0.2481 - rmse: 0.4981 - mae: 0.2626 - mape: 8.1070
Epoch 416: val_loss did not improve from 0.25607
318/318 [=====] - 0s 2ms/step - loss: 0.2641 - mse: 0.2512 - rmse: 0.5012 - mae: 0.2641 - mape: 8.1500 - val_loss: 0.2600 - val_mse: 0.2434 - val_rmse: 0.4934 - val_mae: 0.2600 - val_mape: 7.8561 - lr: 0.0010
Epoch 417/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2671 - mse: 0.2523 - rmse: 0.5022 - mae: 0.2671 - mape: 8.2733
Epoch 417: val_loss did not improve from 0.25607
318/318 [=====] - 0s 1ms/step - loss: 0.2664 - mse: 0.2516 - rmse: 0.5016 - mae: 0.2664 - mape: 8.2784 - val_loss: 0.2737 - val_mse: 0.2619 - val_rmse: 0.5118 - val_mae: 0.2737 - val_mape: 8.7251 - lr: 0.0010
Epoch 418/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2621 - mse: 0.2485

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- rmse: 0.4985 - mae: 0.2621 - mape: 8.1096
Epoch 418: val_loss did not improve from 0.25607
318/318 [=====] - 0s 2ms/step - loss: 0.2624 - mse:
0.2491 - rmse: 0.4991 - mae: 0.2624 - mape: 8.1154 - val_loss: 0.2606 - val_mse:
0.2491 - val_rmse: 0.4991 - val_mae: 0.2606 - val_mape: 8.2709 - lr: 0.0010
Epoch 419/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2686 - mse: 0.2584
- rmse: 0.5084 - mae: 0.2686 - mape: 8.3050
Epoch 419: val_loss did not improve from 0.25607
318/318 [=====] - 0s 1ms/step - loss: 0.2667 - mse:
0.2544 - rmse: 0.5044 - mae: 0.2667 - mape: 8.2456 - val_loss: 0.2752 - val_mse:
0.2751 - val_rmse: 0.5245 - val_mae: 0.2752 - val_mape: 8.1229 - lr: 0.0010
Epoch 420/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2643 - mse: 0.2528
- rmse: 0.5028 - mae: 0.2643 - mape: 8.2045
Epoch 420: val_loss improved from 0.25607 to 0.25593, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2639 - mse:
0.2517 - rmse: 0.5017 - mae: 0.2639 - mape: 8.1836 - val_loss: 0.2559 - val_mse:
0.2440 - val_rmse: 0.4940 - val_mae: 0.2559 - val_mape: 7.9787 - lr: 0.0010
Epoch 421/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2654 - mse: 0.2567
- rmse: 0.5066 - mae: 0.2654 - mape: 8.1950
Epoch 421: val_loss did not improve from 0.25593
318/318 [=====] - 1s 2ms/step - loss: 0.2631 - mse:
0.2526 - rmse: 0.5026 - mae: 0.2631 - mape: 8.1440 - val_loss: 0.2636 - val_mse:
0.2476 - val_rmse: 0.4976 - val_mae: 0.2636 - val_mape: 8.4297 - lr: 0.0010
Epoch 422/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2626 - mse: 0.2505
- rmse: 0.5005 - mae: 0.2626 - mape: 8.1356
Epoch 422: val_loss did not improve from 0.25593
318/318 [=====] - 0s 1ms/step - loss: 0.2624 - mse:
0.2498 - rmse: 0.4998 - mae: 0.2624 - mape: 8.1274 - val_loss: 0.2769 - val_mse:
0.2791 - val_rmse: 0.5283 - val_mae: 0.2769 - val_mape: 8.0205 - lr: 0.0010
Epoch 423/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2637 - mse: 0.2491
- rmse: 0.4991 - mae: 0.2637 - mape: 8.1690
Epoch 423: val_loss did not improve from 0.25593
318/318 [=====] - 1s 2ms/step - loss: 0.2630 - mse:
0.2489 - rmse: 0.4989 - mae: 0.2630 - mape: 8.1374 - val_loss: 0.2726 - val_mse:
0.2738 - val_rmse: 0.5233 - val_mae: 0.2726 - val_mape: 7.9783 - lr: 0.0010
Epoch 424/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2650 - mse: 0.2550
- rmse: 0.5050 - mae: 0.2650 - mape: 8.2046
Epoch 424: val_loss did not improve from 0.25593
318/318 [=====] - 1s 2ms/step - loss: 0.2653 - mse:
0.2556 - rmse: 0.5056 - mae: 0.2653 - mape: 8.2170 - val_loss: 0.2597 - val_mse:
0.2380 - val_rmse: 0.4878 - val_mae: 0.2597 - val_mape: 7.9799 - lr: 0.0010

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Epoch 425/2000
318/318 [=====] - ETA: 0s - loss: 0.2631 - mse: 0.2525
- rmse: 0.5024 - mae: 0.2631 - mape: 8.1362
Epoch 425: val_loss did not improve from 0.25593
318/318 [=====] - 0s 2ms/step - loss: 0.2631 - mse:
0.2525 - rmse: 0.5024 - mae: 0.2631 - mape: 8.1362 - val_loss: 0.2627 - val_mse:
0.2510 - val_rmse: 0.5010 - val_mae: 0.2627 - val_mape: 8.3490 - lr: 0.0010
Epoch 426/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2653 - mse: 0.2537
- rmse: 0.5037 - mae: 0.2653 - mape: 8.2399
Epoch 426: val_loss improved from 0.25593 to 0.25568, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2637 - mse:
0.2509 - rmse: 0.5009 - mae: 0.2637 - mape: 8.1917 - val_loss: 0.2557 - val_mse:
0.2447 - val_rmse: 0.4946 - val_mae: 0.2557 - val_mape: 8.0284 - lr: 0.0010
Epoch 427/2000
294/318 [=====>...] - ETA: 0s - loss: 0.2640 - mse: 0.2527
- rmse: 0.5027 - mae: 0.2640 - mape: 8.1470
Epoch 427: val_loss improved from 0.25568 to 0.25565, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2634 - mse:
0.2521 - rmse: 0.5021 - mae: 0.2634 - mape: 8.1340 - val_loss: 0.2557 - val_mse:
0.2411 - val_rmse: 0.4910 - val_mae: 0.2557 - val_mape: 7.9228 - lr: 0.0010
Epoch 428/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2618 - mse: 0.2486
- rmse: 0.4986 - mae: 0.2618 - mape: 8.1388
Epoch 428: val_loss did not improve from 0.25565
318/318 [=====] - 1s 2ms/step - loss: 0.2616 - mse:
0.2482 - rmse: 0.4982 - mae: 0.2616 - mape: 8.1203 - val_loss: 0.2607 - val_mse:
0.2457 - val_rmse: 0.4957 - val_mae: 0.2607 - val_mape: 7.8737 - lr: 0.0010
Epoch 429/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2637 - mse: 0.2504
- rmse: 0.5004 - mae: 0.2637 - mape: 8.1853
Epoch 429: val_loss did not improve from 0.25565
318/318 [=====] - 0s 2ms/step - loss: 0.2630 - mse:
0.2491 - rmse: 0.4991 - mae: 0.2630 - mape: 8.1716 - val_loss: 0.2641 - val_mse:
0.2455 - val_rmse: 0.4955 - val_mae: 0.2641 - val_mape: 8.0495 - lr: 0.0010
Epoch 430/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2660 - mse: 0.2555
- rmse: 0.5054 - mae: 0.2660 - mape: 8.2232
Epoch 430: val_loss did not improve from 0.25565
318/318 [=====] - 1s 2ms/step - loss: 0.2660 - mse:
0.2554 - rmse: 0.5053 - mae: 0.2660 - mape: 8.2234 - val_loss: 0.2643 - val_mse:
0.2467 - val_rmse: 0.4967 - val_mae: 0.2643 - val_mape: 8.3576 - lr: 0.0010
Epoch 431/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2618 - mse: 0.2506
- rmse: 0.5006 - mae: 0.2618 - mape: 8.1133
Epoch 431: val_loss did not improve from 0.25565

318/318 [=====] - 0s 2ms/step - loss: 0.2613 - mse: 0.2497 - rmse: 0.4997 - mae: 0.2613 - mape: 8.0959 - val_loss: 0.2563 - val_mse: 0.2414 - val_rmse: 0.4913 - val_mae: 0.2563 - val_mape: 7.9346 - lr: 0.0010
Epoch 432/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2648 - mse: 0.2531 - rmse: 0.5031 - mae: 0.2648 - mape: 8.2011
Epoch 432: val_loss did not improve from 0.25565
318/318 [=====] - 1s 2ms/step - loss: 0.2648 - mse: 0.2530 - rmse: 0.5030 - mae: 0.2648 - mape: 8.2081 - val_loss: 0.2592 - val_mse: 0.2410 - val_rmse: 0.4910 - val_mae: 0.2592 - val_mape: 7.9529 - lr: 0.0010
Epoch 433/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2631 - mse: 0.2500 - rmse: 0.5000 - mae: 0.2631 - mape: 8.1236
Epoch 433: val_loss did not improve from 0.25565
318/318 [=====] - 0s 1ms/step - loss: 0.2631 - mse: 0.2498 - rmse: 0.4998 - mae: 0.2631 - mape: 8.1219 - val_loss: 0.2663 - val_mse: 0.2538 - val_rmse: 0.5038 - val_mae: 0.2663 - val_mape: 8.5763 - lr: 0.0010
Epoch 434/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2633 - mse: 0.2538 - rmse: 0.5038 - mae: 0.2633 - mape: 8.1743
Epoch 434: val_loss did not improve from 0.25565
318/318 [=====] - 0s 1ms/step - loss: 0.2636 - mse: 0.2532 - rmse: 0.5032 - mae: 0.2636 - mape: 8.1823 - val_loss: 0.2587 - val_mse: 0.2426 - val_rmse: 0.4926 - val_mae: 0.2587 - val_mape: 8.1177 - lr: 0.0010
Epoch 435/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2625 - mse: 0.2509 - rmse: 0.5009 - mae: 0.2625 - mape: 8.0969
Epoch 435: val_loss did not improve from 0.25565
318/318 [=====] - 0s 2ms/step - loss: 0.2637 - mse: 0.2523 - rmse: 0.5023 - mae: 0.2637 - mape: 8.1345 - val_loss: 0.2658 - val_mse: 0.2545 - val_rmse: 0.5045 - val_mae: 0.2658 - val_mape: 8.4656 - lr: 0.0010
Epoch 436/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2638 - mse: 0.2523 - rmse: 0.5023 - mae: 0.2638 - mape: 8.1758
Epoch 436: val_loss did not improve from 0.25565
318/318 [=====] - 0s 1ms/step - loss: 0.2633 - mse: 0.2500 - rmse: 0.5000 - mae: 0.2633 - mape: 8.1555 - val_loss: 0.2751 - val_mse: 0.2901 - val_rmse: 0.5386 - val_mae: 0.2751 - val_mape: 8.0253 - lr: 0.0010
Epoch 437/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2661 - mse: 0.2591 - rmse: 0.5090 - mae: 0.2661 - mape: 8.2353
Epoch 437: val_loss did not improve from 0.25565
318/318 [=====] - 0s 1ms/step - loss: 0.2649 - mse: 0.2574 - rmse: 0.5073 - mae: 0.2649 - mape: 8.1999 - val_loss: 0.2583 - val_mse: 0.2412 - val_rmse: 0.4912 - val_mae: 0.2583 - val_mape: 8.0977 - lr: 0.0010
Epoch 438/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2640 - mse: 0.2513 - rmse: 0.5013 - mae: 0.2640 - mape: 8.1775

Epoch 438: val_loss did not improve from 0.25565
318/318 [=====] - 0s 1ms/step - loss: 0.2643 - mse: 0.2526 - rmse: 0.5026 - mae: 0.2643 - mape: 8.1781 - val_loss: 0.2886 - val_mse: 0.2609 - val_rmse: 0.5108 - val_mae: 0.2886 - val_mape: 9.5063 - lr: 0.0010
Epoch 439/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2678 - mse: 0.2577 - rmse: 0.5077 - mae: 0.2678 - mape: 8.2805
Epoch 439: val_loss did not improve from 0.25565
318/318 [=====] - 0s 1ms/step - loss: 0.2646 - mse: 0.2526 - rmse: 0.5026 - mae: 0.2646 - mape: 8.1823 - val_loss: 0.2644 - val_mse: 0.2564 - val_rmse: 0.5063 - val_mae: 0.2644 - val_mape: 8.4012 - lr: 0.0010
Epoch 440/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2630 - mse: 0.2528 - rmse: 0.5028 - mae: 0.2630 - mape: 8.1218
Epoch 440: val_loss did not improve from 0.25565
318/318 [=====] - 1s 2ms/step - loss: 0.2622 - mse: 0.2511 - rmse: 0.5011 - mae: 0.2622 - mape: 8.0954 - val_loss: 0.2573 - val_mse: 0.2390 - val_rmse: 0.4889 - val_mae: 0.2573 - val_mape: 7.9349 - lr: 0.0010
Epoch 441/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2679 - mse: 0.2582 - rmse: 0.5081 - mae: 0.2679 - mape: 8.3041
Epoch 441: val_loss did not improve from 0.25565
318/318 [=====] - 0s 1ms/step - loss: 0.2673 - mse: 0.2570 - rmse: 0.5069 - mae: 0.2673 - mape: 8.2695 - val_loss: 0.2579 - val_mse: 0.2400 - val_rmse: 0.4899 - val_mae: 0.2579 - val_mape: 7.8300 - lr: 0.0010
Epoch 442/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2633 - mse: 0.2559 - rmse: 0.5058 - mae: 0.2633 - mape: 8.1203
Epoch 442: val_loss did not improve from 0.25565
318/318 [=====] - 0s 1ms/step - loss: 0.2628 - mse: 0.2532 - rmse: 0.5031 - mae: 0.2628 - mape: 8.1145 - val_loss: 0.2687 - val_mse: 0.2611 - val_rmse: 0.5110 - val_mae: 0.2687 - val_mape: 8.7235 - lr: 0.0010
Epoch 443/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2647 - mse: 0.2533 - rmse: 0.5032 - mae: 0.2647 - mape: 8.2018
Epoch 443: val_loss did not improve from 0.25565
318/318 [=====] - 0s 2ms/step - loss: 0.2644 - mse: 0.2522 - rmse: 0.5022 - mae: 0.2644 - mape: 8.1987 - val_loss: 0.2582 - val_mse: 0.2451 - val_rmse: 0.4951 - val_mae: 0.2582 - val_mape: 7.9421 - lr: 0.0010
Epoch 444/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2635 - mse: 0.2518 - rmse: 0.5018 - mae: 0.2635 - mape: 8.1455
Epoch 444: val_loss did not improve from 0.25565
318/318 [=====] - 0s 2ms/step - loss: 0.2645 - mse: 0.2536 - rmse: 0.5036 - mae: 0.2645 - mape: 8.1687 - val_loss: 0.2576 - val_mse: 0.2424 - val_rmse: 0.4924 - val_mae: 0.2576 - val_mape: 7.7859 - lr: 0.0010
Epoch 445/2000
266/318 [=====>...] - ETA: 0s - loss: 0.2598 - mse: 0.2455

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- rmse: 0.4955 - mae: 0.2598 - mape: 8.0039
Epoch 445: val_loss did not improve from 0.25565
318/318 [=====] - 1s 2ms/step - loss: 0.2613 - mse:
0.2492 - rmse: 0.4992 - mae: 0.2613 - mape: 8.0526 - val_loss: 0.2614 - val_mse:
0.2467 - val_rmse: 0.4967 - val_mae: 0.2614 - val_mape: 8.2336 - lr: 0.0010
Epoch 446/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2646 - mse: 0.2521
- rmse: 0.5021 - mae: 0.2646 - mape: 8.1371
Epoch 446: val_loss did not improve from 0.25565
318/318 [=====] - 1s 2ms/step - loss: 0.2649 - mse:
0.2525 - rmse: 0.5025 - mae: 0.2649 - mape: 8.1444 - val_loss: 0.2894 - val_mse:
0.3164 - val_rmse: 0.5625 - val_mae: 0.2894 - val_mape: 9.5316 - lr: 0.0010
Epoch 447/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2630 - mse: 0.2504
- rmse: 0.5004 - mae: 0.2630 - mape: 8.1379
Epoch 447: val_loss did not improve from 0.25565
318/318 [=====] - 1s 2ms/step - loss: 0.2631 - mse:
0.2509 - rmse: 0.5009 - mae: 0.2631 - mape: 8.1446 - val_loss: 0.2636 - val_mse:
0.2551 - val_rmse: 0.5050 - val_mae: 0.2636 - val_mape: 7.9015 - lr: 0.0010
Epoch 448/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2618 - mse: 0.2495
- rmse: 0.4995 - mae: 0.2618 - mape: 8.0999
Epoch 448: val_loss did not improve from 0.25565
318/318 [=====] - 0s 2ms/step - loss: 0.2617 - mse:
0.2492 - rmse: 0.4992 - mae: 0.2617 - mape: 8.0989 - val_loss: 0.2811 - val_mse:
0.2817 - val_rmse: 0.5308 - val_mae: 0.2811 - val_mape: 8.2732 - lr: 0.0010
Epoch 449/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2683 - mse: 0.2595
- rmse: 0.5094 - mae: 0.2683 - mape: 8.3021
Epoch 449: val_loss did not improve from 0.25565
318/318 [=====] - 1s 2ms/step - loss: 0.2666 - mse:
0.2560 - rmse: 0.5060 - mae: 0.2666 - mape: 8.2593 - val_loss: 0.2600 - val_mse:
0.2434 - val_rmse: 0.4933 - val_mae: 0.2600 - val_mape: 8.1988 - lr: 0.0010
Epoch 450/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2678 - mse: 0.2587
- rmse: 0.5086 - mae: 0.2678 - mape: 8.2825
Epoch 450: val_loss did not improve from 0.25565
318/318 [=====] - 0s 2ms/step - loss: 0.2677 - mse:
0.2584 - rmse: 0.5083 - mae: 0.2677 - mape: 8.2761 - val_loss: 0.2578 - val_mse:
0.2437 - val_rmse: 0.4937 - val_mae: 0.2578 - val_mape: 7.9111 - lr: 0.0010
Epoch 451/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2629 - mse: 0.2504
- rmse: 0.5004 - mae: 0.2629 - mape: 8.1375
Epoch 451: val_loss did not improve from 0.25565
318/318 [=====] - 0s 2ms/step - loss: 0.2629 - mse:
0.2503 - rmse: 0.5003 - mae: 0.2629 - mape: 8.1355 - val_loss: 0.2730 - val_mse:
0.2574 - val_rmse: 0.5073 - val_mae: 0.2730 - val_mape: 8.7749 - lr: 0.0010
Epoch 452/2000

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291/318 [=====>...] - ETA: 0s - loss: 0.2644 - mse: 0.2550
- rmse: 0.5050 - mae: 0.2644 - mape: 8.2133
Epoch 452: val_loss did not improve from 0.25565
318/318 [=====] - 1s 2ms/step - loss: 0.2643 - mse:
0.2537 - rmse: 0.5037 - mae: 0.2643 - mape: 8.2027 - val_loss: 0.2619 - val_mse:
0.2448 - val_rmse: 0.4948 - val_mae: 0.2619 - val_mape: 8.3149 - lr: 0.0010
Epoch 453/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2653 - mse: 0.2556
- rmse: 0.5055 - mae: 0.2653 - mape: 8.2027
Epoch 453: val_loss did not improve from 0.25565
318/318 [=====] - 0s 2ms/step - loss: 0.2651 - mse:
0.2552 - rmse: 0.5052 - mae: 0.2651 - mape: 8.1949 - val_loss: 0.2573 - val_mse:
0.2448 - val_rmse: 0.4948 - val_mae: 0.2573 - val_mape: 7.8189 - lr: 0.0010
Epoch 454/2000
289/318 [=====>...] - ETA: 0s - loss: 0.2627 - mse: 0.2534
- rmse: 0.5034 - mae: 0.2627 - mape: 8.1391
Epoch 454: val_loss did not improve from 0.25565
318/318 [=====] - 0s 2ms/step - loss: 0.2626 - mse:
0.2519 - rmse: 0.5019 - mae: 0.2626 - mape: 8.1279 - val_loss: 0.2677 - val_mse:
0.2560 - val_rmse: 0.5060 - val_mae: 0.2677 - val_mape: 8.5758 - lr: 0.0010
Epoch 455/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2620 - mse: 0.2503
- rmse: 0.5003 - mae: 0.2620 - mape: 8.1233
Epoch 455: val_loss did not improve from 0.25565
318/318 [=====] - 0s 1ms/step - loss: 0.2617 - mse:
0.2494 - rmse: 0.4994 - mae: 0.2617 - mape: 8.0927 - val_loss: 0.2569 - val_mse:
0.2390 - val_rmse: 0.4888 - val_mae: 0.2569 - val_mape: 8.0083 - lr: 0.0010
Epoch 456/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2617 - mse: 0.2476
- rmse: 0.4976 - mae: 0.2617 - mape: 8.0818
Epoch 456: val_loss improved from 0.25565 to 0.25482, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2613 - mse:
0.2478 - rmse: 0.4978 - mae: 0.2613 - mape: 8.0735 - val_loss: 0.2548 - val_mse:
0.2409 - val_rmse: 0.4908 - val_mae: 0.2548 - val_mape: 7.8919 - lr: 0.0010
Epoch 457/2000
270/318 [=====>...] - ETA: 0s - loss: 0.2632 - mse: 0.2520
- rmse: 0.5020 - mae: 0.2632 - mape: 8.1630
Epoch 457: val_loss did not improve from 0.25482
318/318 [=====] - 0s 1ms/step - loss: 0.2630 - mse:
0.2514 - rmse: 0.5014 - mae: 0.2630 - mape: 8.1420 - val_loss: 0.2569 - val_mse:
0.2376 - val_rmse: 0.4874 - val_mae: 0.2569 - val_mape: 7.9420 - lr: 0.0010
Epoch 458/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2636 - mse: 0.2498
- rmse: 0.4998 - mae: 0.2636 - mape: 8.1353
Epoch 458: val_loss did not improve from 0.25482
318/318 [=====] - 0s 1ms/step - loss: 0.2643 - mse:
0.2512 - rmse: 0.5012 - mae: 0.2643 - mape: 8.1563 - val_loss: 0.2609 - val_mse:

0.2488 - val_rmse: 0.4988 - val_mae: 0.2609 - val_mape: 8.2519 - lr: 0.0010
Epoch 459/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2637 - mse: 0.2551
- rmse: 0.5050 - mae: 0.2637 - mape: 8.1518
Epoch 459: val_loss did not improve from 0.25482
318/318 [=====] - 1s 2ms/step - loss: 0.2634 - mse:
0.2545 - rmse: 0.5044 - mae: 0.2634 - mape: 8.1596 - val_loss: 0.2736 - val_mse:
0.2670 - val_rmse: 0.5167 - val_mae: 0.2736 - val_mape: 8.0897 - lr: 0.0010
Epoch 460/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2628 - mse: 0.2520
- rmse: 0.5020 - mae: 0.2628 - mape: 8.1304
Epoch 460: val_loss did not improve from 0.25482
318/318 [=====] - 0s 1ms/step - loss: 0.2625 - mse:
0.2534 - rmse: 0.5034 - mae: 0.2625 - mape: 8.1203 - val_loss: 0.2686 - val_mse:
0.2566 - val_rmse: 0.5065 - val_mae: 0.2686 - val_mape: 7.9485 - lr: 0.0010
Epoch 461/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2622 - mse: 0.2506
- rmse: 0.5006 - mae: 0.2622 - mape: 8.0928
Epoch 461: val_loss did not improve from 0.25482
318/318 [=====] - 1s 2ms/step - loss: 0.2622 - mse:
0.2507 - rmse: 0.5007 - mae: 0.2622 - mape: 8.0916 - val_loss: 0.2658 - val_mse:
0.2549 - val_rmse: 0.5049 - val_mae: 0.2658 - val_mape: 8.0141 - lr: 0.0010
Epoch 462/2000
264/318 [=====>...] - ETA: 0s - loss: 0.2580 - mse: 0.2398
- rmse: 0.4897 - mae: 0.2580 - mape: 8.0087
Epoch 462: val_loss did not improve from 0.25482
318/318 [=====] - 0s 1ms/step - loss: 0.2613 - mse:
0.2471 - rmse: 0.4971 - mae: 0.2613 - mape: 8.1039 - val_loss: 0.2650 - val_mse:
0.2419 - val_rmse: 0.4918 - val_mae: 0.2650 - val_mape: 8.0676 - lr: 0.0010
Epoch 463/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2617 - mse: 0.2472
- rmse: 0.4972 - mae: 0.2617 - mape: 8.0795
Epoch 463: val_loss did not improve from 0.25482
318/318 [=====] - 0s 1ms/step - loss: 0.2616 - mse:
0.2475 - rmse: 0.4975 - mae: 0.2616 - mape: 8.0772 - val_loss: 0.2559 - val_mse:
0.2410 - val_rmse: 0.4909 - val_mae: 0.2559 - val_mape: 7.9005 - lr: 0.0010
Epoch 464/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2632 - mse: 0.2512
- rmse: 0.5012 - mae: 0.2632 - mape: 8.1457
Epoch 464: val_loss did not improve from 0.25482
318/318 [=====] - 1s 2ms/step - loss: 0.2625 - mse:
0.2494 - rmse: 0.4994 - mae: 0.2625 - mape: 8.1085 - val_loss: 0.2838 - val_mse:
0.2966 - val_rmse: 0.5446 - val_mae: 0.2838 - val_mape: 9.3348 - lr: 0.0010
Epoch 465/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2632 - mse: 0.2537
- rmse: 0.5037 - mae: 0.2632 - mape: 8.1489
Epoch 465: val_loss did not improve from 0.25482
318/318 [=====] - 0s 2ms/step - loss: 0.2628 - mse:

0.2530 - rmse: 0.5030 - mae: 0.2628 - mape: 8.1388 - val_loss: 0.2579 - val_mse: 0.2452 - val_rmse: 0.4952 - val_mae: 0.2579 - val_mape: 7.8226 - lr: 0.0010
Epoch 466/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2627 - mse: 0.2511 - rmse: 0.5011 - mae: 0.2627 - mape: 8.1587
Epoch 466: val_loss did not improve from 0.25482
318/318 [=====] - 1s 2ms/step - loss: 0.2625 - mse: 0.2505 - rmse: 0.5005 - mae: 0.2625 - mape: 8.1544 - val_loss: 0.2587 - val_mse: 0.2379 - val_rmse: 0.4877 - val_mae: 0.2587 - val_mape: 7.8490 - lr: 0.0010
Epoch 467/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2614 - mse: 0.2476 - rmse: 0.4976 - mae: 0.2614 - mape: 8.0753
Epoch 467: val_loss did not improve from 0.25482
318/318 [=====] - 0s 2ms/step - loss: 0.2606 - mse: 0.2460 - rmse: 0.4960 - mae: 0.2606 - mape: 8.0511 - val_loss: 0.2571 - val_mse: 0.2432 - val_rmse: 0.4932 - val_mae: 0.2571 - val_mape: 8.0223 - lr: 0.0010
Epoch 468/2000
267/318 [=====>...] - ETA: 0s - loss: 0.2668 - mse: 0.2577 - rmse: 0.5077 - mae: 0.2668 - mape: 8.2678
Epoch 468: val_loss did not improve from 0.25482
318/318 [=====] - 1s 2ms/step - loss: 0.2669 - mse: 0.2594 - rmse: 0.5094 - mae: 0.2669 - mape: 8.2421 - val_loss: 0.2616 - val_mse: 0.2520 - val_rmse: 0.5020 - val_mae: 0.2616 - val_mape: 8.3618 - lr: 0.0010
Epoch 469/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2634 - mse: 0.2551 - rmse: 0.5051 - mae: 0.2634 - mape: 8.1441
Epoch 469: val_loss did not improve from 0.25482
318/318 [=====] - 0s 2ms/step - loss: 0.2636 - mse: 0.2550 - rmse: 0.5050 - mae: 0.2636 - mape: 8.1423 - val_loss: 0.2637 - val_mse: 0.2481 - val_rmse: 0.4981 - val_mae: 0.2637 - val_mape: 7.8908 - lr: 0.0010
Epoch 470/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2628 - mse: 0.2500 - rmse: 0.5000 - mae: 0.2628 - mape: 8.1347
Epoch 470: val_loss did not improve from 0.25482
318/318 [=====] - 1s 2ms/step - loss: 0.2619 - mse: 0.2488 - rmse: 0.4988 - mae: 0.2619 - mape: 8.1159 - val_loss: 0.2580 - val_mse: 0.2473 - val_rmse: 0.4973 - val_mae: 0.2580 - val_mape: 7.9772 - lr: 0.0010
Epoch 471/2000
318/318 [=====] - ETA: 0s - loss: 0.2651 - mse: 0.2544 - rmse: 0.5044 - mae: 0.2651 - mape: 8.2404
Epoch 471: val_loss did not improve from 0.25482
318/318 [=====] - 0s 2ms/step - loss: 0.2651 - mse: 0.2544 - rmse: 0.5044 - mae: 0.2651 - mape: 8.2404 - val_loss: 0.2565 - val_mse: 0.2385 - val_rmse: 0.4884 - val_mae: 0.2565 - val_mape: 7.9812 - lr: 0.0010
Epoch 472/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2638 - mse: 0.2530 - rmse: 0.5030 - mae: 0.2638 - mape: 8.1822
Epoch 472: val_loss did not improve from 0.25482

318/318 [=====] - 1s 2ms/step - loss: 0.2641 - mse: 0.2535 - rmse: 0.5035 - mae: 0.2641 - mape: 8.1789 - val_loss: 0.2608 - val_mse: 0.2497 - val_rmse: 0.4997 - val_mae: 0.2608 - val_mape: 8.2531 - lr: 0.0010
Epoch 473/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2627 - mse: 0.2517 - rmse: 0.5017 - mae: 0.2627 - mape: 8.1187
Epoch 473: val_loss did not improve from 0.25482
318/318 [=====] - 0s 2ms/step - loss: 0.2628 - mse: 0.2518 - rmse: 0.5018 - mae: 0.2628 - mape: 8.1226 - val_loss: 0.2552 - val_mse: 0.2376 - val_rmse: 0.4874 - val_mae: 0.2552 - val_mape: 7.8778 - lr: 0.0010
Epoch 474/2000
263/318 [=====>...] - ETA: 0s - loss: 0.2620 - mse: 0.2516 - rmse: 0.5016 - mae: 0.2620 - mape: 8.0687
Epoch 474: val_loss did not improve from 0.25482
318/318 [=====] - 1s 2ms/step - loss: 0.2634 - mse: 0.2542 - rmse: 0.5042 - mae: 0.2634 - mape: 8.1090 - val_loss: 0.2963 - val_mse: 0.3319 - val_rmse: 0.5761 - val_mae: 0.2963 - val_mape: 9.7564 - lr: 0.0010
Epoch 475/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2670 - mse: 0.2558 - rmse: 0.5057 - mae: 0.2670 - mape: 8.3007
Epoch 475: val_loss did not improve from 0.25482
318/318 [=====] - 0s 1ms/step - loss: 0.2672 - mse: 0.2559 - rmse: 0.5059 - mae: 0.2672 - mape: 8.3234 - val_loss: 0.2658 - val_mse: 0.2514 - val_rmse: 0.5014 - val_mae: 0.2658 - val_mape: 8.0577 - lr: 0.0010
Epoch 476/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2639 - mse: 0.2545 - rmse: 0.5045 - mae: 0.2639 - mape: 8.1879
Epoch 476: val_loss did not improve from 0.25482
318/318 [=====] - 0s 1ms/step - loss: 0.2632 - mse: 0.2529 - rmse: 0.5029 - mae: 0.2632 - mape: 8.1632 - val_loss: 0.2555 - val_mse: 0.2438 - val_rmse: 0.4938 - val_mae: 0.2555 - val_mape: 7.8058 - lr: 0.0010
Epoch 477/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2603 - mse: 0.2487 - rmse: 0.4987 - mae: 0.2603 - mape: 8.0467
Epoch 477: val_loss did not improve from 0.25482
318/318 [=====] - 1s 2ms/step - loss: 0.2609 - mse: 0.2494 - rmse: 0.4994 - mae: 0.2609 - mape: 8.0738 - val_loss: 0.2573 - val_mse: 0.2421 - val_rmse: 0.4920 - val_mae: 0.2573 - val_mape: 7.9211 - lr: 0.0010
Epoch 478/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2622 - mse: 0.2496 - rmse: 0.4996 - mae: 0.2622 - mape: 8.0980
Epoch 478: val_loss did not improve from 0.25482
318/318 [=====] - 0s 1ms/step - loss: 0.2617 - mse: 0.2509 - rmse: 0.5009 - mae: 0.2617 - mape: 8.0874 - val_loss: 0.2619 - val_mse: 0.2492 - val_rmse: 0.4992 - val_mae: 0.2619 - val_mape: 8.3242 - lr: 0.0010
Epoch 479/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2642 - mse: 0.2564 - rmse: 0.5064 - mae: 0.2642 - mape: 8.1455

Epoch 479: val_loss improved from 0.25482 to 0.25479, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2631 - mse:
0.2542 - rmse: 0.5042 - mae: 0.2631 - mape: 8.1184 - val_loss: 0.2548 - val_mse:
0.2366 - val_rmse: 0.4864 - val_mae: 0.2548 - val_mape: 7.8380 - lr: 0.0010
Epoch 480/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2644 - mse: 0.2552
- rmse: 0.5052 - mae: 0.2644 - mape: 8.1611
Epoch 480: val_loss did not improve from 0.25479
318/318 [=====] - 0s 1ms/step - loss: 0.2646 - mse:
0.2546 - rmse: 0.5045 - mae: 0.2646 - mape: 8.1692 - val_loss: 0.2580 - val_mse:
0.2481 - val_rmse: 0.4981 - val_mae: 0.2580 - val_mape: 8.2147 - lr: 0.0010
Epoch 481/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2597 - mse: 0.2470
- rmse: 0.4970 - mae: 0.2597 - mape: 8.0375
Epoch 481: val_loss did not improve from 0.25479
318/318 [=====] - 0s 1ms/step - loss: 0.2619 - mse:
0.2504 - rmse: 0.5004 - mae: 0.2619 - mape: 8.1049 - val_loss: 0.2635 - val_mse:
0.2472 - val_rmse: 0.4971 - val_mae: 0.2635 - val_mape: 8.0276 - lr: 0.0010
Epoch 482/2000
263/318 [=====>...] - ETA: 0s - loss: 0.2598 - mse: 0.2448
- rmse: 0.4948 - mae: 0.2598 - mape: 8.0331
Epoch 482: val_loss did not improve from 0.25479
318/318 [=====] - 0s 1ms/step - loss: 0.2607 - mse:
0.2465 - rmse: 0.4965 - mae: 0.2607 - mape: 8.0705 - val_loss: 0.2626 - val_mse:
0.2534 - val_rmse: 0.5034 - val_mae: 0.2626 - val_mape: 7.9623 - lr: 0.0010
Epoch 483/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2654 - mse: 0.2532
- rmse: 0.5032 - mae: 0.2654 - mape: 8.2464
Epoch 483: val_loss did not improve from 0.25479
318/318 [=====] - 0s 1ms/step - loss: 0.2655 - mse:
0.2532 - rmse: 0.5032 - mae: 0.2655 - mape: 8.2452 - val_loss: 0.2727 - val_mse:
0.2683 - val_rmse: 0.5180 - val_mae: 0.2727 - val_mape: 8.1905 - lr: 0.0010
Epoch 484/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2639 - mse: 0.2555
- rmse: 0.5055 - mae: 0.2639 - mape: 8.1753
Epoch 484: val_loss did not improve from 0.25479
318/318 [=====] - 0s 2ms/step - loss: 0.2627 - mse:
0.2517 - rmse: 0.5017 - mae: 0.2627 - mape: 8.1423 - val_loss: 0.2560 - val_mse:
0.2445 - val_rmse: 0.4944 - val_mae: 0.2560 - val_mape: 7.9912 - lr: 0.0010
Epoch 485/2000
318/318 [=====] - ETA: 0s - loss: 0.2638 - mse: 0.2550
- rmse: 0.5050 - mae: 0.2638 - mape: 8.1944
Epoch 485: val_loss did not improve from 0.25479
318/318 [=====] - 0s 1ms/step - loss: 0.2638 - mse:
0.2550 - rmse: 0.5050 - mae: 0.2638 - mape: 8.1944 - val_loss: 0.2574 - val_mse:
0.2427 - val_rmse: 0.4926 - val_mae: 0.2574 - val_mape: 8.1179 - lr: 0.0010
Epoch 486/2000

266/318 [=====>...] - ETA: 0s - loss: 0.2630 - mse: 0.2468
- rmse: 0.4968 - mae: 0.2630 - mape: 8.1694
Epoch 486: val_loss did not improve from 0.25479
318/318 [=====] - 1s 2ms/step - loss: 0.2635 - mse:
0.2522 - rmse: 0.5022 - mae: 0.2635 - mape: 8.1817 - val_loss: 0.2554 - val_mse:
0.2421 - val_rmse: 0.4921 - val_mae: 0.2554 - val_mape: 7.9071 - lr: 0.0010
Epoch 487/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2631 - mse: 0.2539
- rmse: 0.5038 - mae: 0.2631 - mape: 8.1242
Epoch 487: val_loss did not improve from 0.25479
318/318 [=====] - 1s 2ms/step - loss: 0.2642 - mse:
0.2573 - rmse: 0.5073 - mae: 0.2642 - mape: 8.1458 - val_loss: 0.2734 - val_mse:
0.2452 - val_rmse: 0.4952 - val_mae: 0.2734 - val_mape: 8.6803 - lr: 0.0010
Epoch 488/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2661 - mse: 0.2539
- rmse: 0.5039 - mae: 0.2661 - mape: 8.2272
Epoch 488: val_loss did not improve from 0.25479
318/318 [=====] - 1s 2ms/step - loss: 0.2662 - mse:
0.2546 - rmse: 0.5046 - mae: 0.2662 - mape: 8.2294 - val_loss: 0.2663 - val_mse:
0.2544 - val_rmse: 0.5044 - val_mae: 0.2663 - val_mape: 8.4307 - lr: 0.0010
Epoch 489/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2655 - mse: 0.2546
- rmse: 0.5046 - mae: 0.2655 - mape: 8.2065
Epoch 489: val_loss did not improve from 0.25479
318/318 [=====] - 0s 2ms/step - loss: 0.2652 - mse:
0.2544 - rmse: 0.5044 - mae: 0.2652 - mape: 8.2021 - val_loss: 0.2558 - val_mse:
0.2452 - val_rmse: 0.4952 - val_mae: 0.2558 - val_mape: 8.0296 - lr: 0.0010
Epoch 490/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2635 - mse: 0.2525
- rmse: 0.5025 - mae: 0.2635 - mape: 8.1064
Epoch 490: val_loss did not improve from 0.25479
318/318 [=====] - 1s 2ms/step - loss: 0.2644 - mse:
0.2534 - rmse: 0.5034 - mae: 0.2644 - mape: 8.1303 - val_loss: 0.3013 - val_mse:
0.2739 - val_rmse: 0.5233 - val_mae: 0.3013 - val_mape: 9.5326 - lr: 0.0010
Epoch 491/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2629 - mse: 0.2516
- rmse: 0.5016 - mae: 0.2629 - mape: 8.1554
Epoch 491: val_loss did not improve from 0.25479
318/318 [=====] - 1s 2ms/step - loss: 0.2624 - mse:
0.2507 - rmse: 0.5007 - mae: 0.2624 - mape: 8.1471 - val_loss: 0.2677 - val_mse:
0.2574 - val_rmse: 0.5073 - val_mae: 0.2677 - val_mape: 7.9940 - lr: 0.0010
Epoch 492/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2629 - mse: 0.2499
- rmse: 0.4999 - mae: 0.2629 - mape: 8.1154
Epoch 492: val_loss did not improve from 0.25479
318/318 [=====] - 1s 2ms/step - loss: 0.2627 - mse:
0.2499 - rmse: 0.4999 - mae: 0.2627 - mape: 8.1094 - val_loss: 0.2613 - val_mse:
0.2554 - val_rmse: 0.5053 - val_mae: 0.2613 - val_mape: 8.3386 - lr: 0.0010

Epoch 493/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2604 - mse: 0.2518
- rmse: 0.5018 - mae: 0.2604 - mape: 8.0636
Epoch 493: val_loss did not improve from 0.25479
318/318 [=====] - 0s 2ms/step - loss: 0.2605 - mse:
0.2515 - rmse: 0.5015 - mae: 0.2605 - mape: 8.0686 - val_loss: 0.2747 - val_mse:
0.2735 - val_rmse: 0.5230 - val_mae: 0.2747 - val_mape: 8.7436 - lr: 0.0010
Epoch 494/2000
318/318 [=====] - ETA: 0s - loss: 0.2628 - mse: 0.2508
- rmse: 0.5008 - mae: 0.2628 - mape: 8.1301
Epoch 494: val_loss did not improve from 0.25479
318/318 [=====] - 1s 2ms/step - loss: 0.2628 - mse:
0.2508 - rmse: 0.5008 - mae: 0.2628 - mape: 8.1301 - val_loss: 0.2590 - val_mse:
0.2427 - val_rmse: 0.4926 - val_mae: 0.2590 - val_mape: 7.9309 - lr: 0.0010
Epoch 495/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2616 - mse: 0.2514
- rmse: 0.5014 - mae: 0.2616 - mape: 8.0837
Epoch 495: val_loss did not improve from 0.25479
318/318 [=====] - 0s 1ms/step - loss: 0.2608 - mse:
0.2508 - rmse: 0.5008 - mae: 0.2608 - mape: 8.0494 - val_loss: 0.2555 - val_mse:
0.2412 - val_rmse: 0.4911 - val_mae: 0.2555 - val_mape: 7.9642 - lr: 0.0010
Epoch 496/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2603 - mse: 0.2505
- rmse: 0.5005 - mae: 0.2603 - mape: 8.0599
Epoch 496: val_loss did not improve from 0.25479
318/318 [=====] - 0s 2ms/step - loss: 0.2604 - mse:
0.2500 - rmse: 0.5000 - mae: 0.2604 - mape: 8.0624 - val_loss: 0.2586 - val_mse:
0.2456 - val_rmse: 0.4956 - val_mae: 0.2586 - val_mape: 8.0743 - lr: 0.0010
Epoch 497/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2540 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2540 - mape: 7.8502
Epoch 497: val_loss improved from 0.25479 to 0.25338, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2540 - mse:
0.2388 - rmse: 0.4887 - mae: 0.2540 - mape: 7.8380 - val_loss: 0.2534 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2534 - val_mape: 7.8800 - lr: 1.0000e-04
Epoch 498/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2534 - mse: 0.2389
- rmse: 0.4887 - mae: 0.2534 - mape: 7.8193
Epoch 498: val_loss improved from 0.25338 to 0.25281, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2536 - mse:
0.2397 - rmse: 0.4896 - mae: 0.2536 - mape: 7.8318 - val_loss: 0.2528 - val_mse:
0.2385 - val_rmse: 0.4884 - val_mae: 0.2528 - val_mape: 7.8067 - lr: 1.0000e-04
Epoch 499/2000
272/318 [=====>...] - ETA: 0s - loss: 0.2538 - mse: 0.2388
- rmse: 0.4887 - mae: 0.2538 - mape: 7.8587
Epoch 499: val_loss did not improve from 0.25281

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318/318 [=====] - 0s 1ms/step - loss: 0.2539 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2539 - mape: 7.8380 - val_loss: 0.2533 - val_mse:
0.2405 - val_rmse: 0.4904 - val_mae: 0.2533 - val_mape: 7.8879 - lr: 1.0000e-04
Epoch 500/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2539 - mse: 0.2420
- rmse: 0.4919 - mae: 0.2539 - mape: 7.8434
Epoch 500: val_loss did not improve from 0.25281
318/318 [=====] - 0s 1ms/step - loss: 0.2534 - mse:
0.2406 - rmse: 0.4905 - mae: 0.2534 - mape: 7.8319 - val_loss: 0.2537 - val_mse:
0.2398 - val_rmse: 0.4896 - val_mae: 0.2537 - val_mape: 7.9368 - lr: 1.0000e-04
Epoch 501/2000
289/318 [=====>...] - ETA: 0s - loss: 0.2529 - mse: 0.2399
- rmse: 0.4898 - mae: 0.2529 - mape: 7.8291
Epoch 501: val_loss did not improve from 0.25281
318/318 [=====] - 1s 2ms/step - loss: 0.2533 - mse:
0.2408 - rmse: 0.4908 - mae: 0.2533 - mape: 7.8532 - val_loss: 0.2550 - val_mse:
0.2414 - val_rmse: 0.4913 - val_mae: 0.2550 - val_mape: 7.7791 - lr: 1.0000e-04
Epoch 502/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2540 - mse: 0.2410
- rmse: 0.4909 - mae: 0.2540 - mape: 7.8506
Epoch 502: val_loss improved from 0.25281 to 0.25279, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2537 - mse:
0.2407 - rmse: 0.4906 - mae: 0.2537 - mape: 7.8391 - val_loss: 0.2528 - val_mse:
0.2411 - val_rmse: 0.4910 - val_mae: 0.2528 - val_mape: 7.7749 - lr: 1.0000e-04
Epoch 503/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2537 - mse: 0.2410
- rmse: 0.4909 - mae: 0.2537 - mape: 7.8441
Epoch 503: val_loss did not improve from 0.25279
318/318 [=====] - 1s 2ms/step - loss: 0.2535 - mse:
0.2412 - rmse: 0.4911 - mae: 0.2535 - mape: 7.8499 - val_loss: 0.2535 - val_mse:
0.2411 - val_rmse: 0.4910 - val_mae: 0.2535 - val_mape: 7.7559 - lr: 1.0000e-04
Epoch 504/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2537 - mse: 0.2415
- rmse: 0.4914 - mae: 0.2537 - mape: 7.8306
Epoch 504: val_loss did not improve from 0.25279
318/318 [=====] - 0s 1ms/step - loss: 0.2532 - mse:
0.2402 - rmse: 0.4901 - mae: 0.2532 - mape: 7.8364 - val_loss: 0.2534 - val_mse:
0.2409 - val_rmse: 0.4908 - val_mae: 0.2534 - val_mape: 7.8989 - lr: 1.0000e-04
Epoch 505/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2538 - mse: 0.2413
- rmse: 0.4913 - mae: 0.2538 - mape: 7.8521
Epoch 505: val_loss did not improve from 0.25279
318/318 [=====] - 1s 2ms/step - loss: 0.2533 - mse:
0.2405 - rmse: 0.4905 - mae: 0.2533 - mape: 7.8457 - val_loss: 0.2529 - val_mse:
0.2403 - val_rmse: 0.4902 - val_mae: 0.2529 - val_mape: 7.8087 - lr: 1.0000e-04
Epoch 506/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2533 - mse: 0.2402

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- rmse: 0.4901 - mae: 0.2533 - mape: 7.8402
Epoch 506: val_loss did not improve from 0.25279
318/318 [=====] - 0s 2ms/step - loss: 0.2534 - mse:
0.2410 - rmse: 0.4910 - mae: 0.2534 - mape: 7.8403 - val_loss: 0.2532 - val_mse:
0.2406 - val_rmse: 0.4905 - val_mae: 0.2532 - val_mape: 7.9100 - lr: 1.0000e-04
Epoch 507/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2542 - mse: 0.2420
- rmse: 0.4920 - mae: 0.2542 - mape: 7.8589
Epoch 507: val_loss did not improve from 0.25279
318/318 [=====] - 1s 2ms/step - loss: 0.2537 - mse:
0.2414 - rmse: 0.4913 - mae: 0.2537 - mape: 7.8485 - val_loss: 0.2539 - val_mse:
0.2417 - val_rmse: 0.4916 - val_mae: 0.2539 - val_mape: 7.7658 - lr: 1.0000e-04
Epoch 508/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2542 - mse: 0.2419
- rmse: 0.4919 - mae: 0.2542 - mape: 7.8804
Epoch 508: val_loss improved from 0.25279 to 0.25242, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2539 - mse:
0.2418 - rmse: 0.4918 - mae: 0.2539 - mape: 7.8672 - val_loss: 0.2524 - val_mse:
0.2401 - val_rmse: 0.4900 - val_mae: 0.2524 - val_mape: 7.8085 - lr: 1.0000e-04
Epoch 509/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2515 - mse: 0.2372
- rmse: 0.4870 - mae: 0.2515 - mape: 7.8002
Epoch 509: val_loss did not improve from 0.25242
318/318 [=====] - 1s 2ms/step - loss: 0.2533 - mse:
0.2408 - rmse: 0.4907 - mae: 0.2533 - mape: 7.8458 - val_loss: 0.2530 - val_mse:
0.2406 - val_rmse: 0.4905 - val_mae: 0.2530 - val_mape: 7.9002 - lr: 1.0000e-04
Epoch 510/2000
309/318 [=====>..] - ETA: 0s - loss: 0.2530 - mse: 0.2426
- rmse: 0.4925 - mae: 0.2530 - mape: 7.8623
Epoch 510: val_loss did not improve from 0.25242
318/318 [=====] - 0s 2ms/step - loss: 0.2534 - mse:
0.2423 - rmse: 0.4922 - mae: 0.2534 - mape: 7.8647 - val_loss: 0.2538 - val_mse:
0.2419 - val_rmse: 0.4918 - val_mae: 0.2538 - val_mape: 7.7589 - lr: 1.0000e-04
Epoch 511/2000
312/318 [=====>..] - ETA: 0s - loss: 0.2535 - mse: 0.2415
- rmse: 0.4914 - mae: 0.2535 - mape: 7.8518
Epoch 511: val_loss improved from 0.25242 to 0.25241, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2532 - mse:
0.2407 - rmse: 0.4906 - mae: 0.2532 - mape: 7.8417 - val_loss: 0.2524 - val_mse:
0.2398 - val_rmse: 0.4897 - val_mae: 0.2524 - val_mape: 7.8135 - lr: 1.0000e-04
Epoch 512/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2536 - mse: 0.2412
- rmse: 0.4911 - mae: 0.2536 - mape: 7.8619
Epoch 512: val_loss did not improve from 0.25241
318/318 [=====] - 1s 2ms/step - loss: 0.2532 - mse:
0.2402 - rmse: 0.4901 - mae: 0.2532 - mape: 7.8431 - val_loss: 0.2542 - val_mse:

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0.2424 - val_rmse: 0.4924 - val_mae: 0.2542 - val_mape: 7.7532 - lr: 1.0000e-04
Epoch 513/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2536 - mse: 0.2416
- rmse: 0.4915 - mae: 0.2536 - mape: 7.8504
Epoch 513: val_loss did not improve from 0.25241
318/318 [=====] - 1s 2ms/step - loss: 0.2537 - mse:
0.2422 - rmse: 0.4921 - mae: 0.2537 - mape: 7.8550 - val_loss: 0.2540 - val_mse:
0.2425 - val_rmse: 0.4924 - val_mae: 0.2540 - val_mape: 7.9362 - lr: 1.0000e-04
Epoch 514/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2529 - mse: 0.2412
- rmse: 0.4912 - mae: 0.2529 - mape: 7.8376
Epoch 514: val_loss did not improve from 0.25241
318/318 [=====] - 0s 2ms/step - loss: 0.2532 - mse:
0.2410 - rmse: 0.4909 - mae: 0.2532 - mape: 7.8439 - val_loss: 0.2530 - val_mse:
0.2408 - val_rmse: 0.4907 - val_mae: 0.2530 - val_mape: 7.7644 - lr: 1.0000e-04
Epoch 515/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2521 - mse: 0.2397
- rmse: 0.4896 - mae: 0.2521 - mape: 7.8120
Epoch 515: val_loss did not improve from 0.25241
318/318 [=====] - 0s 2ms/step - loss: 0.2531 - mse:
0.2417 - rmse: 0.4916 - mae: 0.2531 - mape: 7.8469 - val_loss: 0.2527 - val_mse:
0.2404 - val_rmse: 0.4903 - val_mae: 0.2527 - val_mape: 7.7621 - lr: 1.0000e-04
Epoch 516/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2526 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2526 - mape: 7.8262
Epoch 516: val_loss improved from 0.25241 to 0.25220, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2533 - mse:
0.2410 - rmse: 0.4909 - mae: 0.2533 - mape: 7.8370 - val_loss: 0.2522 - val_mse:
0.2398 - val_rmse: 0.4897 - val_mae: 0.2522 - val_mape: 7.8299 - lr: 1.0000e-04
Epoch 517/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2543 - mse: 0.2427
- rmse: 0.4926 - mae: 0.2543 - mape: 7.8598
Epoch 517: val_loss did not improve from 0.25220
318/318 [=====] - 1s 2ms/step - loss: 0.2529 - mse:
0.2408 - rmse: 0.4907 - mae: 0.2529 - mape: 7.8304 - val_loss: 0.2532 - val_mse:
0.2412 - val_rmse: 0.4912 - val_mae: 0.2532 - val_mape: 7.7639 - lr: 1.0000e-04
Epoch 518/2000
266/318 [=====>...] - ETA: 0s - loss: 0.2540 - mse: 0.2445
- rmse: 0.4945 - mae: 0.2540 - mape: 7.8670
Epoch 518: val_loss did not improve from 0.25220
318/318 [=====] - 0s 1ms/step - loss: 0.2532 - mse:
0.2413 - rmse: 0.4912 - mae: 0.2532 - mape: 7.8318 - val_loss: 0.2535 - val_mse:
0.2412 - val_rmse: 0.4911 - val_mae: 0.2535 - val_mape: 7.9453 - lr: 1.0000e-04
Epoch 519/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2533 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2533 - mape: 7.8300
Epoch 519: val_loss did not improve from 0.25220

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318/318 [=====] - 0s 2ms/step - loss: 0.2533 - mse:
0.2407 - rmse: 0.4906 - mae: 0.2533 - mape: 7.8333 - val_loss: 0.2537 - val_mse:
0.2425 - val_rmse: 0.4925 - val_mae: 0.2537 - val_mape: 7.9539 - lr: 1.0000e-04
Epoch 520/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2538 - mse: 0.2423
- rmse: 0.4922 - mae: 0.2538 - mape: 7.8846
Epoch 520: val_loss did not improve from 0.25220
318/318 [=====] - 0s 1ms/step - loss: 0.2529 - mse:
0.2410 - rmse: 0.4909 - mae: 0.2529 - mape: 7.8403 - val_loss: 0.2529 - val_mse:
0.2399 - val_rmse: 0.4898 - val_mae: 0.2529 - val_mape: 7.9035 - lr: 1.0000e-04
Epoch 521/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2531 - mse: 0.2407
- rmse: 0.4906 - mae: 0.2531 - mape: 7.8538
Epoch 521: val_loss did not improve from 0.25220
318/318 [=====] - 0s 2ms/step - loss: 0.2534 - mse:
0.2419 - rmse: 0.4919 - mae: 0.2534 - mape: 7.8498 - val_loss: 0.2536 - val_mse:
0.2417 - val_rmse: 0.4916 - val_mae: 0.2536 - val_mape: 7.9474 - lr: 1.0000e-04
Epoch 522/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2538 - mse: 0.2397
- rmse: 0.4896 - mae: 0.2538 - mape: 7.8684
Epoch 522: val_loss did not improve from 0.25220
318/318 [=====] - 0s 1ms/step - loss: 0.2532 - mse:
0.2406 - rmse: 0.4905 - mae: 0.2532 - mape: 7.8419 - val_loss: 0.2522 - val_mse:
0.2402 - val_rmse: 0.4901 - val_mae: 0.2522 - val_mape: 7.8122 - lr: 1.0000e-04
Epoch 523/2000
301/318 [=====>..] - ETA: 0s - loss: 0.2507 - mse: 0.2381
- rmse: 0.4879 - mae: 0.2507 - mape: 7.7895
Epoch 523: val_loss did not improve from 0.25220
318/318 [=====] - 0s 2ms/step - loss: 0.2529 - mse:
0.2414 - rmse: 0.4913 - mae: 0.2529 - mape: 7.8407 - val_loss: 0.2535 - val_mse:
0.2411 - val_rmse: 0.4910 - val_mae: 0.2535 - val_mape: 7.7496 - lr: 1.0000e-04
Epoch 524/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2506 - mse: 0.2383
- rmse: 0.4881 - mae: 0.2506 - mape: 7.7837
Epoch 524: val_loss did not improve from 0.25220
318/318 [=====] - 0s 1ms/step - loss: 0.2532 - mse:
0.2411 - rmse: 0.4910 - mae: 0.2532 - mape: 7.8475 - val_loss: 0.2525 - val_mse:
0.2400 - val_rmse: 0.4899 - val_mae: 0.2525 - val_mape: 7.8742 - lr: 1.0000e-04
Epoch 525/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2529 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2529 - mape: 7.8317
Epoch 525: val_loss improved from 0.25220 to 0.25214, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse:
0.2402 - rmse: 0.4901 - mae: 0.2528 - mape: 7.8286 - val_loss: 0.2521 - val_mse:
0.2397 - val_rmse: 0.4896 - val_mae: 0.2521 - val_mape: 7.8173 - lr: 1.0000e-04
Epoch 526/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2530 - mse: 0.2417

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- rmse: 0.4916 - mae: 0.2530 - mape: 7.8385
Epoch 526: val_loss did not improve from 0.25214
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse:
0.2417 - rmse: 0.4916 - mae: 0.2528 - mape: 7.8428 - val_loss: 0.2527 - val_mse:
0.2404 - val_rmse: 0.4903 - val_mae: 0.2527 - val_mape: 7.7634 - lr: 1.0000e-04
Epoch 527/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2544 - mse: 0.2448
- rmse: 0.4948 - mae: 0.2544 - mape: 7.8826
Epoch 527: val_loss did not improve from 0.25214
318/318 [=====] - 1s 2ms/step - loss: 0.2531 - mse:
0.2414 - rmse: 0.4914 - mae: 0.2531 - mape: 7.8412 - val_loss: 0.2522 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2522 - val_mape: 7.8268 - lr: 1.0000e-04
Epoch 528/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2528 - mse: 0.2382
- rmse: 0.4881 - mae: 0.2528 - mape: 7.8428
Epoch 528: val_loss did not improve from 0.25214
318/318 [=====] - 1s 2ms/step - loss: 0.2530 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2530 - mape: 7.8450 - val_loss: 0.2524 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2524 - val_mape: 7.7797 - lr: 1.0000e-04
Epoch 529/2000
298/318 [=====>..] - ETA: 0s - loss: 0.2540 - mse: 0.2417
- rmse: 0.4917 - mae: 0.2540 - mape: 7.8507
Epoch 529: val_loss improved from 0.25214 to 0.25205, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2535 - mse:
0.2417 - rmse: 0.4916 - mae: 0.2535 - mape: 7.8461 - val_loss: 0.2521 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2521 - val_mape: 7.7876 - lr: 1.0000e-04
Epoch 530/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2530 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2530 - mape: 7.8196
Epoch 530: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2530 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2530 - mape: 7.8285 - val_loss: 0.2527 - val_mse:
0.2396 - val_rmse: 0.4895 - val_mae: 0.2527 - val_mape: 7.7660 - lr: 1.0000e-04
Epoch 531/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2526 - mse: 0.2396
- rmse: 0.4895 - mae: 0.2526 - mape: 7.8174
Epoch 531: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2532 - mse:
0.2411 - rmse: 0.4911 - mae: 0.2532 - mape: 7.8426 - val_loss: 0.2522 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2522 - val_mape: 7.8260 - lr: 1.0000e-04
Epoch 532/2000
294/318 [=====>...] - ETA: 0s - loss: 0.2519 - mse: 0.2381
- rmse: 0.4879 - mae: 0.2519 - mape: 7.8088
Epoch 532: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse:
0.2403 - rmse: 0.4902 - mae: 0.2528 - mape: 7.8157 - val_loss: 0.2522 - val_mse:
0.2396 - val_rmse: 0.4895 - val_mae: 0.2522 - val_mape: 7.8299 - lr: 1.0000e-04

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Epoch 533/2000
307/318 [=====>...] - ETA: 0s - loss: 0.2536 - mse: 0.2420
- rmse: 0.4920 - mae: 0.2536 - mape: 7.8569
Epoch 533: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2533 - mse:
0.2415 - rmse: 0.4914 - mae: 0.2533 - mape: 7.8465 - val_loss: 0.2525 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2525 - val_mape: 7.8049 - lr: 1.0000e-04
Epoch 534/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2534 - mse: 0.2407
- rmse: 0.4906 - mae: 0.2534 - mape: 7.8587
Epoch 534: val_loss did not improve from 0.25205
318/318 [=====] - 0s 2ms/step - loss: 0.2533 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2533 - mape: 7.8547 - val_loss: 0.2525 - val_mse:
0.2393 - val_rmse: 0.4891 - val_mae: 0.2525 - val_mape: 7.7958 - lr: 1.0000e-04
Epoch 535/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2537 - mse: 0.2420
- rmse: 0.4919 - mae: 0.2537 - mape: 7.8585
Epoch 535: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2532 - mse:
0.2411 - rmse: 0.4911 - mae: 0.2532 - mape: 7.8385 - val_loss: 0.2530 - val_mse:
0.2401 - val_rmse: 0.4900 - val_mae: 0.2530 - val_mape: 7.7385 - lr: 1.0000e-04
Epoch 536/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2523 - mse: 0.2375
- rmse: 0.4873 - mae: 0.2523 - mape: 7.8336
Epoch 536: val_loss did not improve from 0.25205
318/318 [=====] - 0s 1ms/step - loss: 0.2532 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2532 - mape: 7.8460 - val_loss: 0.2575 - val_mse:
0.2468 - val_rmse: 0.4968 - val_mae: 0.2575 - val_mape: 7.7766 - lr: 1.0000e-04
Epoch 537/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2523 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2523 - mape: 7.8102
Epoch 537: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2528 - mape: 7.8211 - val_loss: 0.2521 - val_mse:
0.2385 - val_rmse: 0.4883 - val_mae: 0.2521 - val_mape: 7.7955 - lr: 1.0000e-04
Epoch 538/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2536 - mse: 0.2420
- rmse: 0.4920 - mae: 0.2536 - mape: 7.8523
Epoch 538: val_loss did not improve from 0.25205
318/318 [=====] - 0s 1ms/step - loss: 0.2530 - mse:
0.2406 - rmse: 0.4906 - mae: 0.2530 - mape: 7.8399 - val_loss: 0.2521 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2521 - val_mape: 7.8022 - lr: 1.0000e-04
Epoch 539/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2522 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2522 - mape: 7.8211
Epoch 539: val_loss did not improve from 0.25205
318/318 [=====] - 0s 1ms/step - loss: 0.2529 - mse:
0.2406 - rmse: 0.4905 - mae: 0.2529 - mape: 7.8233 - val_loss: 0.2528 - val_mse:

0.2401 - val_rmse: 0.4900 - val_mae: 0.2528 - val_mape: 7.9097 - lr: 1.0000e-04
Epoch 540/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2518 - mse: 0.2380
- rmse: 0.4878 - mae: 0.2518 - mape: 7.8176
Epoch 540: val_loss did not improve from 0.25205
318/318 [=====] - 0s 1ms/step - loss: 0.2526 - mse:
0.2402 - rmse: 0.4901 - mae: 0.2526 - mape: 7.8385 - val_loss: 0.2535 - val_mse:
0.2411 - val_rmse: 0.4910 - val_mae: 0.2535 - val_mape: 7.7350 - lr: 1.0000e-04
Epoch 541/2000
294/318 [=====>...] - ETA: 0s - loss: 0.2540 - mse: 0.2429
- rmse: 0.4928 - mae: 0.2540 - mape: 7.8629
Epoch 541: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2531 - mse:
0.2410 - rmse: 0.4909 - mae: 0.2531 - mape: 7.8362 - val_loss: 0.2531 - val_mse:
0.2407 - val_rmse: 0.4907 - val_mae: 0.2531 - val_mape: 7.7313 - lr: 1.0000e-04
Epoch 542/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2525 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2525 - mape: 7.8026
Epoch 542: val_loss did not improve from 0.25205
318/318 [=====] - 0s 1ms/step - loss: 0.2531 - mse:
0.2407 - rmse: 0.4906 - mae: 0.2531 - mape: 7.8242 - val_loss: 0.2521 - val_mse:
0.2398 - val_rmse: 0.4897 - val_mae: 0.2521 - val_mape: 7.7650 - lr: 1.0000e-04
Epoch 543/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2518 - mse: 0.2388
- rmse: 0.4886 - mae: 0.2518 - mape: 7.7957
Epoch 543: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2529 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2529 - mape: 7.8210 - val_loss: 0.2527 - val_mse:
0.2408 - val_rmse: 0.4907 - val_mae: 0.2527 - val_mape: 7.7400 - lr: 1.0000e-04
Epoch 544/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2523 - mse: 0.2387
- rmse: 0.4885 - mae: 0.2523 - mape: 7.8178
Epoch 544: val_loss did not improve from 0.25205
318/318 [=====] - 0s 1ms/step - loss: 0.2532 - mse:
0.2412 - rmse: 0.4911 - mae: 0.2532 - mape: 7.8363 - val_loss: 0.2528 - val_mse:
0.2402 - val_rmse: 0.4901 - val_mae: 0.2528 - val_mape: 7.8329 - lr: 1.0000e-04
Epoch 545/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2531 - mse: 0.2425
- rmse: 0.4924 - mae: 0.2531 - mape: 7.8307
Epoch 545: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse:
0.2407 - rmse: 0.4906 - mae: 0.2528 - mape: 7.8344 - val_loss: 0.2524 - val_mse:
0.2389 - val_rmse: 0.4888 - val_mae: 0.2524 - val_mape: 7.8220 - lr: 1.0000e-04
Epoch 546/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2525 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2525 - mape: 7.8196
Epoch 546: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2531 - mse:

0.2408 - rmse: 0.4907 - mae: 0.2531 - mape: 7.8280 - val_loss: 0.2526 - val_mse: 0.2398 - val_rmse: 0.4897 - val_mae: 0.2526 - val_mape: 7.7999 - lr: 1.0000e-04
Epoch 547/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2528 - mse: 0.2402 - rmse: 0.4901 - mae: 0.2528 - mape: 7.8395
Epoch 547: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2527 - mse: 0.2407 - rmse: 0.4907 - mae: 0.2527 - mape: 7.8398 - val_loss: 0.2524 - val_mse: 0.2396 - val_rmse: 0.4895 - val_mae: 0.2524 - val_mape: 7.7656 - lr: 1.0000e-04
Epoch 548/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2529 - mse: 0.2411 - rmse: 0.4911 - mae: 0.2529 - mape: 7.8223
Epoch 548: val_loss did not improve from 0.25205
318/318 [=====] - 0s 2ms/step - loss: 0.2528 - mse: 0.2408 - rmse: 0.4907 - mae: 0.2528 - mape: 7.8169 - val_loss: 0.2541 - val_mse: 0.2415 - val_rmse: 0.4914 - val_mae: 0.2541 - val_mape: 7.7618 - lr: 1.0000e-04
Epoch 549/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2525 - mse: 0.2390 - rmse: 0.4889 - mae: 0.2525 - mape: 7.8106
Epoch 549: val_loss did not improve from 0.25205
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse: 0.2396 - rmse: 0.4894 - mae: 0.2528 - mape: 7.8256 - val_loss: 0.2523 - val_mse: 0.2403 - val_rmse: 0.4902 - val_mae: 0.2523 - val_mape: 7.7748 - lr: 1.0000e-04
Epoch 550/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2525 - mse: 0.2398 - rmse: 0.4897 - mae: 0.2525 - mape: 7.8240
Epoch 550: val_loss did not improve from 0.25205
318/318 [=====] - 0s 2ms/step - loss: 0.2528 - mse: 0.2406 - rmse: 0.4906 - mae: 0.2528 - mape: 7.8309 - val_loss: 0.2521 - val_mse: 0.2385 - val_rmse: 0.4883 - val_mae: 0.2521 - val_mape: 7.8245 - lr: 1.0000e-04
Epoch 551/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2533 - mse: 0.2414 - rmse: 0.4913 - mae: 0.2533 - mape: 7.8432
Epoch 551: val_loss improved from 0.25205 to 0.25190, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2529 - mse: 0.2407 - rmse: 0.4906 - mae: 0.2529 - mape: 7.8308 - val_loss: 0.2519 - val_mse: 0.2394 - val_rmse: 0.4893 - val_mae: 0.2519 - val_mape: 7.7978 - lr: 1.0000e-04
Epoch 552/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2537 - mse: 0.2410 - rmse: 0.4909 - mae: 0.2537 - mape: 7.8610
Epoch 552: val_loss did not improve from 0.25190
318/318 [=====] - 1s 2ms/step - loss: 0.2531 - mse: 0.2409 - rmse: 0.4908 - mae: 0.2531 - mape: 7.8536 - val_loss: 0.2532 - val_mse: 0.2411 - val_rmse: 0.4910 - val_mae: 0.2532 - val_mape: 7.7473 - lr: 1.0000e-04
Epoch 553/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2535 - mse: 0.2417 - rmse: 0.4916 - mae: 0.2535 - mape: 7.8446

Epoch 553: val_loss did not improve from 0.25190
318/318 [=====] - 0s 2ms/step - loss: 0.2532 - mse:
0.2408 - rmse: 0.4908 - mae: 0.2532 - mape: 7.8331 - val_loss: 0.2527 - val_mse:
0.2384 - val_rmse: 0.4882 - val_mae: 0.2527 - val_mape: 7.8188 - lr: 1.0000e-04
Epoch 554/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2535 - mse: 0.2410
- rmse: 0.4909 - mae: 0.2535 - mape: 7.8372
Epoch 554: val_loss did not improve from 0.25190
318/318 [=====] - 1s 2ms/step - loss: 0.2533 - mse:
0.2411 - rmse: 0.4911 - mae: 0.2533 - mape: 7.8356 - val_loss: 0.2534 - val_mse:
0.2414 - val_rmse: 0.4913 - val_mae: 0.2534 - val_mape: 7.9597 - lr: 1.0000e-04
Epoch 555/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2520 - mse: 0.2384
- rmse: 0.4883 - mae: 0.2520 - mape: 7.7983
Epoch 555: val_loss did not improve from 0.25190
318/318 [=====] - 0s 2ms/step - loss: 0.2525 - mse:
0.2397 - rmse: 0.4896 - mae: 0.2525 - mape: 7.8232 - val_loss: 0.2527 - val_mse:
0.2409 - val_rmse: 0.4909 - val_mae: 0.2527 - val_mape: 7.7627 - lr: 1.0000e-04
Epoch 556/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2533 - mse: 0.2419
- rmse: 0.4919 - mae: 0.2533 - mape: 7.8483
Epoch 556: val_loss did not improve from 0.25190
318/318 [=====] - 1s 2ms/step - loss: 0.2537 - mse:
0.2418 - rmse: 0.4918 - mae: 0.2537 - mape: 7.8551 - val_loss: 0.2545 - val_mse:
0.2440 - val_rmse: 0.4940 - val_mae: 0.2545 - val_mape: 8.0042 - lr: 1.0000e-04
Epoch 557/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2538 - mse: 0.2417
- rmse: 0.4916 - mae: 0.2538 - mape: 7.8477
Epoch 557: val_loss did not improve from 0.25190
318/318 [=====] - 0s 1ms/step - loss: 0.2532 - mse:
0.2411 - rmse: 0.4910 - mae: 0.2532 - mape: 7.8398 - val_loss: 0.2543 - val_mse:
0.2438 - val_rmse: 0.4937 - val_mae: 0.2543 - val_mape: 7.9721 - lr: 1.0000e-04
Epoch 558/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2536 - mse: 0.2419
- rmse: 0.4918 - mae: 0.2536 - mape: 7.8687
Epoch 558: val_loss did not improve from 0.25190
318/318 [=====] - 1s 2ms/step - loss: 0.2527 - mse:
0.2401 - rmse: 0.4900 - mae: 0.2527 - mape: 7.8241 - val_loss: 0.2519 - val_mse:
0.2397 - val_rmse: 0.4896 - val_mae: 0.2519 - val_mape: 7.8174 - lr: 1.0000e-04
Epoch 559/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2518 - mse: 0.2370
- rmse: 0.4868 - mae: 0.2518 - mape: 7.8125
Epoch 559: val_loss did not improve from 0.25190
318/318 [=====] - 0s 1ms/step - loss: 0.2535 - mse:
0.2416 - rmse: 0.4915 - mae: 0.2535 - mape: 7.8582 - val_loss: 0.2539 - val_mse:
0.2404 - val_rmse: 0.4903 - val_mae: 0.2539 - val_mape: 7.7622 - lr: 1.0000e-04
Epoch 560/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2521 - mse: 0.2394

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- rmse: 0.4893 - mae: 0.2521 - mape: 7.7914
Epoch 560: val_loss did not improve from 0.25190
318/318 [=====] - 1s 2ms/step - loss: 0.2525 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2525 - mape: 7.8174 - val_loss: 0.2525 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2525 - val_mape: 7.7662 - lr: 1.0000e-04
Epoch 561/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2512 - mse: 0.2375
- rmse: 0.4873 - mae: 0.2512 - mape: 7.7813
Epoch 561: val_loss did not improve from 0.25190
318/318 [=====] - 0s 1ms/step - loss: 0.2527 - mse:
0.2403 - rmse: 0.4902 - mae: 0.2527 - mape: 7.8099 - val_loss: 0.2520 - val_mse:
0.2388 - val_rmse: 0.4887 - val_mae: 0.2520 - val_mape: 7.8304 - lr: 1.0000e-04
Epoch 562/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2527 - mse: 0.2379
- rmse: 0.4878 - mae: 0.2527 - mape: 7.8310
Epoch 562: val_loss did not improve from 0.25190
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2528 - mape: 7.8371 - val_loss: 0.2524 - val_mse:
0.2407 - val_rmse: 0.4906 - val_mae: 0.2524 - val_mape: 7.7657 - lr: 1.0000e-04
Epoch 563/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2548 - mse: 0.2443
- rmse: 0.4943 - mae: 0.2548 - mape: 7.8718
Epoch 563: val_loss did not improve from 0.25190
318/318 [=====] - 0s 1ms/step - loss: 0.2528 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2528 - mape: 7.8242 - val_loss: 0.2524 - val_mse:
0.2387 - val_rmse: 0.4885 - val_mae: 0.2524 - val_mape: 7.8536 - lr: 1.0000e-04
Epoch 564/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2543 - mse: 0.2434
- rmse: 0.4933 - mae: 0.2543 - mape: 7.8756
Epoch 564: val_loss did not improve from 0.25190
318/318 [=====] - 1s 2ms/step - loss: 0.2527 - mse:
0.2401 - rmse: 0.4900 - mae: 0.2527 - mape: 7.8260 - val_loss: 0.2520 - val_mse:
0.2392 - val_rmse: 0.4890 - val_mae: 0.2520 - val_mape: 7.8274 - lr: 1.0000e-04
Epoch 565/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2548 - mse: 0.2446
- rmse: 0.4946 - mae: 0.2548 - mape: 7.8763
Epoch 565: val_loss did not improve from 0.25190
318/318 [=====] - 0s 1ms/step - loss: 0.2528 - mse:
0.2410 - rmse: 0.4909 - mae: 0.2528 - mape: 7.8331 - val_loss: 0.2521 - val_mse:
0.2389 - val_rmse: 0.4888 - val_mae: 0.2521 - val_mape: 7.8405 - lr: 1.0000e-04
Epoch 566/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2520 - mse: 0.2388
- rmse: 0.4886 - mae: 0.2520 - mape: 7.8204
Epoch 566: val_loss did not improve from 0.25190
318/318 [=====] - 1s 2ms/step - loss: 0.2526 - mse:
0.2408 - rmse: 0.4907 - mae: 0.2526 - mape: 7.8291 - val_loss: 0.2531 - val_mse:
0.2414 - val_rmse: 0.4913 - val_mae: 0.2531 - val_mape: 7.9305 - lr: 1.0000e-04
Epoch 567/2000

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313/318 [=====>.] - ETA: 0s - loss: 0.2531 - mse: 0.2404
- rmse: 0.4903 - mae: 0.2531 - mape: 7.8491
Epoch 567: val_loss did not improve from 0.25190
318/318 [=====] - 0s 2ms/step - loss: 0.2531 - mse:
0.2406 - rmse: 0.4905 - mae: 0.2531 - mape: 7.8466 - val_loss: 0.2522 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2522 - val_mape: 7.8366 - lr: 1.0000e-04
Epoch 568/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2529 - mse: 0.2414
- rmse: 0.4913 - mae: 0.2529 - mape: 7.8481
Epoch 568: val_loss did not improve from 0.25190
318/318 [=====] - 1s 2ms/step - loss: 0.2527 - mse:
0.2407 - rmse: 0.4906 - mae: 0.2527 - mape: 7.8392 - val_loss: 0.2520 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2520 - val_mape: 7.7709 - lr: 1.0000e-04
Epoch 569/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2530 - mse: 0.2406
- rmse: 0.4905 - mae: 0.2530 - mape: 7.8426
Epoch 569: val_loss improved from 0.25190 to 0.25183, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2529 - mse:
0.2403 - rmse: 0.4902 - mae: 0.2529 - mape: 7.8368 - val_loss: 0.2518 - val_mse:
0.2394 - val_rmse: 0.4892 - val_mae: 0.2518 - val_mape: 7.8007 - lr: 1.0000e-04
Epoch 570/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2525 - mse: 0.2380
- rmse: 0.4878 - mae: 0.2525 - mape: 7.8312
Epoch 570: val_loss did not improve from 0.25183
318/318 [=====] - 1s 2ms/step - loss: 0.2531 - mse:
0.2412 - rmse: 0.4911 - mae: 0.2531 - mape: 7.8412 - val_loss: 0.2522 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2522 - val_mape: 7.8038 - lr: 1.0000e-04
Epoch 571/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2526 - mse: 0.2388
- rmse: 0.4887 - mae: 0.2526 - mape: 7.8299
Epoch 571: val_loss did not improve from 0.25183
318/318 [=====] - 1s 2ms/step - loss: 0.2530 - mse:
0.2401 - rmse: 0.4900 - mae: 0.2530 - mape: 7.8417 - val_loss: 0.2522 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2522 - val_mape: 7.7687 - lr: 1.0000e-04
Epoch 572/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2528 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2528 - mape: 7.8077
Epoch 572: val_loss improved from 0.25183 to 0.25168, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2528 - mape: 7.8130 - val_loss: 0.2517 - val_mse:
0.2398 - val_rmse: 0.4897 - val_mae: 0.2517 - val_mape: 7.8186 - lr: 1.0000e-04
Epoch 573/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2521 - mse: 0.2410
- rmse: 0.4909 - mae: 0.2521 - mape: 7.8153
Epoch 573: val_loss did not improve from 0.25168
318/318 [=====] - 1s 2ms/step - loss: 0.2526 - mse:

0.2404 - rmse: 0.4903 - mae: 0.2526 - mape: 7.8255 - val_loss: 0.2541 - val_mse:
0.2405 - val_rmse: 0.4904 - val_mae: 0.2541 - val_mape: 7.7866 - lr: 1.0000e-04
Epoch 574/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2522 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2522 - mape: 7.8141
Epoch 574: val_loss did not improve from 0.25168
318/318 [=====] - 1s 2ms/step - loss: 0.2526 - mse:
0.2399 - rmse: 0.4898 - mae: 0.2526 - mape: 7.8277 - val_loss: 0.2525 - val_mse:
0.2402 - val_rmse: 0.4901 - val_mae: 0.2525 - val_mape: 7.9091 - lr: 1.0000e-04
Epoch 575/2000
266/318 [=====>...] - ETA: 0s - loss: 0.2551 - mse: 0.2423
- rmse: 0.4923 - mae: 0.2551 - mape: 7.8824
Epoch 575: val_loss did not improve from 0.25168
318/318 [=====] - 0s 2ms/step - loss: 0.2526 - mse:
0.2401 - rmse: 0.4900 - mae: 0.2526 - mape: 7.8336 - val_loss: 0.2525 - val_mse:
0.2408 - val_rmse: 0.4908 - val_mae: 0.2525 - val_mape: 7.7469 - lr: 1.0000e-04
Epoch 576/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2520 - mse: 0.2386
- rmse: 0.4884 - mae: 0.2520 - mape: 7.8027
Epoch 576: val_loss did not improve from 0.25168
318/318 [=====] - 0s 2ms/step - loss: 0.2525 - mse:
0.2402 - rmse: 0.4901 - mae: 0.2525 - mape: 7.8238 - val_loss: 0.2583 - val_mse:
0.2492 - val_rmse: 0.4992 - val_mae: 0.2583 - val_mape: 7.7831 - lr: 1.0000e-04
Epoch 577/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2534 - mse: 0.2419
- rmse: 0.4919 - mae: 0.2534 - mape: 7.8181
Epoch 577: val_loss did not improve from 0.25168
318/318 [=====] - 0s 1ms/step - loss: 0.2528 - mse:
0.2403 - rmse: 0.4902 - mae: 0.2528 - mape: 7.8172 - val_loss: 0.2527 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2527 - val_mape: 7.7827 - lr: 1.0000e-04
Epoch 578/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2526 - mse: 0.2409
- rmse: 0.4908 - mae: 0.2526 - mape: 7.8316
Epoch 578: val_loss did not improve from 0.25168
318/318 [=====] - 0s 2ms/step - loss: 0.2529 - mse:
0.2406 - rmse: 0.4905 - mae: 0.2529 - mape: 7.8415 - val_loss: 0.2521 - val_mse:
0.2396 - val_rmse: 0.4895 - val_mae: 0.2521 - val_mape: 7.8161 - lr: 1.0000e-04
Epoch 579/2000
269/318 [=====>...] - ETA: 0s - loss: 0.2530 - mse: 0.2421
- rmse: 0.4921 - mae: 0.2530 - mape: 7.8574
Epoch 579: val_loss did not improve from 0.25168
318/318 [=====] - 0s 1ms/step - loss: 0.2525 - mse:
0.2409 - rmse: 0.4908 - mae: 0.2525 - mape: 7.8201 - val_loss: 0.2520 - val_mse:
0.2397 - val_rmse: 0.4896 - val_mae: 0.2520 - val_mape: 7.8589 - lr: 1.0000e-04
Epoch 580/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2526 - mse: 0.2419
- rmse: 0.4918 - mae: 0.2526 - mape: 7.8401
Epoch 580: val_loss did not improve from 0.25168

318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse:
0.2408 - rmse: 0.4907 - mae: 0.2528 - mape: 7.8528 - val_loss: 0.2521 - val_mse:
0.2403 - val_rmse: 0.4902 - val_mae: 0.2521 - val_mape: 7.7523 - lr: 1.0000e-04
Epoch 581/2000
264/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2366
- rmse: 0.4864 - mae: 0.2517 - mape: 7.8115
Epoch 581: val_loss did not improve from 0.25168
318/318 [=====] - 0s 1ms/step - loss: 0.2527 - mse:
0.2407 - rmse: 0.4906 - mae: 0.2527 - mape: 7.8402 - val_loss: 0.2521 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2521 - val_mape: 7.7505 - lr: 1.0000e-04
Epoch 582/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2539 - mse: 0.2427
- rmse: 0.4927 - mae: 0.2539 - mape: 7.8695
Epoch 582: val_loss did not improve from 0.25168
318/318 [=====] - 1s 2ms/step - loss: 0.2525 - mse:
0.2396 - rmse: 0.4895 - mae: 0.2525 - mape: 7.8229 - val_loss: 0.2519 - val_mse:
0.2390 - val_rmse: 0.4889 - val_mae: 0.2519 - val_mape: 7.8451 - lr: 1.0000e-04
Epoch 583/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2511 - mse: 0.2382
- rmse: 0.4880 - mae: 0.2511 - mape: 7.7984
Epoch 583: val_loss did not improve from 0.25168
318/318 [=====] - 0s 1ms/step - loss: 0.2525 - mse:
0.2401 - rmse: 0.4900 - mae: 0.2525 - mape: 7.8220 - val_loss: 0.2519 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2519 - val_mape: 7.7887 - lr: 1.0000e-04
Epoch 584/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2528 - mse: 0.2399
- rmse: 0.4898 - mae: 0.2528 - mape: 7.8380
Epoch 584: val_loss did not improve from 0.25168
318/318 [=====] - 0s 2ms/step - loss: 0.2523 - mse:
0.2403 - rmse: 0.4902 - mae: 0.2523 - mape: 7.8143 - val_loss: 0.2530 - val_mse:
0.2406 - val_rmse: 0.4905 - val_mae: 0.2530 - val_mape: 7.7273 - lr: 1.0000e-04
Epoch 585/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2547 - mse: 0.2435
- rmse: 0.4935 - mae: 0.2547 - mape: 7.8862
Epoch 585: val_loss did not improve from 0.25168
318/318 [=====] - 0s 1ms/step - loss: 0.2527 - mse:
0.2407 - rmse: 0.4906 - mae: 0.2527 - mape: 7.8300 - val_loss: 0.2517 - val_mse:
0.2398 - val_rmse: 0.4897 - val_mae: 0.2517 - val_mape: 7.7972 - lr: 1.0000e-04
Epoch 586/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2525 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2525 - mape: 7.8175
Epoch 586: val_loss did not improve from 0.25168
318/318 [=====] - 1s 2ms/step - loss: 0.2525 - mse:
0.2398 - rmse: 0.4897 - mae: 0.2525 - mape: 7.8111 - val_loss: 0.2530 - val_mse:
0.2413 - val_rmse: 0.4912 - val_mae: 0.2530 - val_mape: 7.9492 - lr: 1.0000e-04
Epoch 587/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2523 - mse: 0.2397
- rmse: 0.4896 - mae: 0.2523 - mape: 7.8057

Epoch 587: val_loss did not improve from 0.25168
318/318 [=====] - 0s 2ms/step - loss: 0.2527 - mse: 0.2401 - rmse: 0.4900 - mae: 0.2527 - mape: 7.8266 - val_loss: 0.2523 - val_mse: 0.2392 - val_rmse: 0.4891 - val_mae: 0.2523 - val_mape: 7.8598 - lr: 1.0000e-04
Epoch 588/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2528 - mse: 0.2402 - rmse: 0.4901 - mae: 0.2528 - mape: 7.8345
Epoch 588: val_loss did not improve from 0.25168
318/318 [=====] - 0s 2ms/step - loss: 0.2527 - mse: 0.2400 - rmse: 0.4899 - mae: 0.2527 - mape: 7.8318 - val_loss: 0.2518 - val_mse: 0.2403 - val_rmse: 0.4902 - val_mae: 0.2518 - val_mape: 7.7677 - lr: 1.0000e-04
Epoch 589/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2528 - mse: 0.2408 - rmse: 0.4907 - mae: 0.2528 - mape: 7.8357
Epoch 589: val_loss did not improve from 0.25168
318/318 [=====] - 1s 2ms/step - loss: 0.2524 - mse: 0.2406 - rmse: 0.4905 - mae: 0.2524 - mape: 7.8270 - val_loss: 0.2553 - val_mse: 0.2415 - val_rmse: 0.4914 - val_mae: 0.2553 - val_mape: 7.7245 - lr: 1.0000e-04
Epoch 590/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2522 - mse: 0.2400 - rmse: 0.4899 - mae: 0.2522 - mape: 7.8109
Epoch 590: val_loss did not improve from 0.25168
318/318 [=====] - 0s 2ms/step - loss: 0.2528 - mse: 0.2403 - rmse: 0.4902 - mae: 0.2528 - mape: 7.8332 - val_loss: 0.2546 - val_mse: 0.2433 - val_rmse: 0.4933 - val_mae: 0.2546 - val_mape: 7.7427 - lr: 1.0000e-04
Epoch 591/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2525 - mse: 0.2401 - rmse: 0.4900 - mae: 0.2525 - mape: 7.8087
Epoch 591: val_loss improved from 0.25168 to 0.25156, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse: 0.2408 - rmse: 0.4908 - mae: 0.2528 - mape: 7.8142 - val_loss: 0.2516 - val_mse: 0.2388 - val_rmse: 0.4887 - val_mae: 0.2516 - val_mape: 7.8070 - lr: 1.0000e-04
Epoch 592/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2517 - mse: 0.2378 - rmse: 0.4876 - mae: 0.2517 - mape: 7.8174
Epoch 592: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2526 - mse: 0.2403 - rmse: 0.4902 - mae: 0.2526 - mape: 7.8343 - val_loss: 0.2523 - val_mse: 0.2394 - val_rmse: 0.4893 - val_mae: 0.2523 - val_mape: 7.8644 - lr: 1.0000e-04
Epoch 593/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2530 - mse: 0.2404 - rmse: 0.4903 - mae: 0.2530 - mape: 7.8223
Epoch 593: val_loss did not improve from 0.25156
318/318 [=====] - 0s 2ms/step - loss: 0.2526 - mse: 0.2398 - rmse: 0.4897 - mae: 0.2526 - mape: 7.8197 - val_loss: 0.2516 - val_mse: 0.2391 - val_rmse: 0.4890 - val_mae: 0.2516 - val_mape: 7.7694 - lr: 1.0000e-04
Epoch 594/2000

309/318 [=====>.] - ETA: 0s - loss: 0.2528 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2528 - mape: 7.8136
Epoch 594: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2523 - mse:
0.2395 - rmse: 0.4893 - mae: 0.2523 - mape: 7.8043 - val_loss: 0.2533 - val_mse:
0.2419 - val_rmse: 0.4918 - val_mae: 0.2533 - val_mape: 7.7263 - lr: 1.0000e-04
Epoch 595/2000
268/318 [=====>...] - ETA: 0s - loss: 0.2528 - mse: 0.2421
- rmse: 0.4920 - mae: 0.2528 - mape: 7.7974
Epoch 595: val_loss did not improve from 0.25156
318/318 [=====] - 0s 1ms/step - loss: 0.2528 - mse:
0.2400 - rmse: 0.4899 - mae: 0.2528 - mape: 7.8130 - val_loss: 0.2526 - val_mse:
0.2385 - val_rmse: 0.4884 - val_mae: 0.2526 - val_mape: 7.8584 - lr: 1.0000e-04
Epoch 596/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2526 - mse: 0.2389
- rmse: 0.4888 - mae: 0.2526 - mape: 7.8129
Epoch 596: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2524 - mse:
0.2390 - rmse: 0.4889 - mae: 0.2524 - mape: 7.8089 - val_loss: 0.2516 - val_mse:
0.2386 - val_rmse: 0.4885 - val_mae: 0.2516 - val_mape: 7.7770 - lr: 1.0000e-04
Epoch 597/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2543 - mse: 0.2437
- rmse: 0.4936 - mae: 0.2543 - mape: 7.8734
Epoch 597: val_loss did not improve from 0.25156
318/318 [=====] - 0s 1ms/step - loss: 0.2528 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2528 - mape: 7.8221 - val_loss: 0.2522 - val_mse:
0.2387 - val_rmse: 0.4885 - val_mae: 0.2522 - val_mape: 7.8352 - lr: 1.0000e-04
Epoch 598/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2507 - mse: 0.2373
- rmse: 0.4872 - mae: 0.2507 - mape: 7.7664
Epoch 598: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2522 - mse:
0.2398 - rmse: 0.4897 - mae: 0.2522 - mape: 7.8064 - val_loss: 0.2538 - val_mse:
0.2383 - val_rmse: 0.4882 - val_mae: 0.2538 - val_mape: 7.8442 - lr: 1.0000e-04
Epoch 599/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2548 - mse: 0.2455
- rmse: 0.4955 - mae: 0.2548 - mape: 7.8962
Epoch 599: val_loss did not improve from 0.25156
318/318 [=====] - 0s 1ms/step - loss: 0.2529 - mse:
0.2409 - rmse: 0.4908 - mae: 0.2529 - mape: 7.8306 - val_loss: 0.2516 - val_mse:
0.2388 - val_rmse: 0.4887 - val_mae: 0.2516 - val_mape: 7.8052 - lr: 1.0000e-04
Epoch 600/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2525 - mse: 0.2387
- rmse: 0.4886 - mae: 0.2525 - mape: 7.8105
Epoch 600: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2524 - mse:
0.2401 - rmse: 0.4900 - mae: 0.2524 - mape: 7.8177 - val_loss: 0.2517 - val_mse:
0.2387 - val_rmse: 0.4886 - val_mae: 0.2517 - val_mape: 7.7547 - lr: 1.0000e-04

Epoch 601/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2522 - mse: 0.2377
- rmse: 0.4875 - mae: 0.2522 - mape: 7.8142
Epoch 601: val_loss did not improve from 0.25156
318/318 [=====] - 0s 1ms/step - loss: 0.2523 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2523 - mape: 7.8209 - val_loss: 0.2518 - val_mse:
0.2383 - val_rmse: 0.4881 - val_mae: 0.2518 - val_mape: 7.8239 - lr: 1.0000e-04
Epoch 602/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2535 - mse: 0.2418
- rmse: 0.4917 - mae: 0.2535 - mape: 7.8540
Epoch 602: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2526 - mse:
0.2402 - rmse: 0.4901 - mae: 0.2526 - mape: 7.8167 - val_loss: 0.2529 - val_mse:
0.2415 - val_rmse: 0.4914 - val_mae: 0.2529 - val_mape: 7.9061 - lr: 1.0000e-04
Epoch 603/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2382
- rmse: 0.4880 - mae: 0.2517 - mape: 7.8122
Epoch 603: val_loss did not improve from 0.25156
318/318 [=====] - 0s 1ms/step - loss: 0.2526 - mse:
0.2405 - rmse: 0.4904 - mae: 0.2526 - mape: 7.8366 - val_loss: 0.2520 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2520 - val_mape: 7.8043 - lr: 1.0000e-04
Epoch 604/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2518 - mse: 0.2387
- rmse: 0.4886 - mae: 0.2518 - mape: 7.8093
Epoch 604: val_loss did not improve from 0.25156
318/318 [=====] - 0s 1ms/step - loss: 0.2525 - mse:
0.2406 - rmse: 0.4905 - mae: 0.2525 - mape: 7.8171 - val_loss: 0.2516 - val_mse:
0.2397 - val_rmse: 0.4895 - val_mae: 0.2516 - val_mape: 7.8157 - lr: 1.0000e-04
Epoch 605/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2516 - mse: 0.2372
- rmse: 0.4870 - mae: 0.2516 - mape: 7.7986
Epoch 605: val_loss did not improve from 0.25156
318/318 [=====] - 0s 1ms/step - loss: 0.2528 - mse:
0.2411 - rmse: 0.4910 - mae: 0.2528 - mape: 7.8424 - val_loss: 0.2547 - val_mse:
0.2409 - val_rmse: 0.4908 - val_mae: 0.2547 - val_mape: 7.6973 - lr: 1.0000e-04
Epoch 606/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2520 - mse: 0.2380
- rmse: 0.4879 - mae: 0.2520 - mape: 7.8087
Epoch 606: val_loss did not improve from 0.25156
318/318 [=====] - 0s 2ms/step - loss: 0.2525 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2525 - mape: 7.8198 - val_loss: 0.2522 - val_mse:
0.2385 - val_rmse: 0.4883 - val_mae: 0.2522 - val_mape: 7.8614 - lr: 1.0000e-04
Epoch 607/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2520 - mse: 0.2383
- rmse: 0.4882 - mae: 0.2520 - mape: 7.8082
Epoch 607: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2526 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2526 - mape: 7.8210 - val_loss: 0.2527 - val_mse:

0.2404 - val_rmse: 0.4903 - val_mae: 0.2527 - val_mape: 7.7692 - lr: 1.0000e-04
Epoch 608/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2525 - mse: 0.2403
- rmse: 0.4902 - mae: 0.2525 - mape: 7.8332
Epoch 608: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2522 - mse:
0.2402 - rmse: 0.4901 - mae: 0.2522 - mape: 7.8231 - val_loss: 0.2537 - val_mse:
0.2369 - val_rmse: 0.4868 - val_mae: 0.2537 - val_mape: 7.7944 - lr: 1.0000e-04
Epoch 609/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2532 - mse: 0.2412
- rmse: 0.4911 - mae: 0.2532 - mape: 7.8268
Epoch 609: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2528 - mse:
0.2402 - rmse: 0.4902 - mae: 0.2528 - mape: 7.8179 - val_loss: 0.2520 - val_mse:
0.2385 - val_rmse: 0.4884 - val_mae: 0.2520 - val_mape: 7.8531 - lr: 1.0000e-04
Epoch 610/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2522 - mse: 0.2391
- rmse: 0.4890 - mae: 0.2522 - mape: 7.7870
Epoch 610: val_loss did not improve from 0.25156
318/318 [=====] - 1s 2ms/step - loss: 0.2526 - mse:
0.2401 - rmse: 0.4900 - mae: 0.2526 - mape: 7.8112 - val_loss: 0.2556 - val_mse:
0.2428 - val_rmse: 0.4927 - val_mae: 0.2556 - val_mape: 7.7146 - lr: 1.0000e-04
Epoch 611/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2524 - mse: 0.2407
- rmse: 0.4906 - mae: 0.2524 - mape: 7.8290
Epoch 611: val_loss improved from 0.25156 to 0.25150, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2523 - mse:
0.2405 - rmse: 0.4904 - mae: 0.2523 - mape: 7.8168 - val_loss: 0.2515 - val_mse:
0.2387 - val_rmse: 0.4886 - val_mae: 0.2515 - val_mape: 7.7684 - lr: 1.0000e-04
Epoch 612/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2539 - mse: 0.2434
- rmse: 0.4934 - mae: 0.2539 - mape: 7.8703
Epoch 612: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2525 - mse:
0.2404 - rmse: 0.4903 - mae: 0.2525 - mape: 7.8278 - val_loss: 0.2518 - val_mse:
0.2386 - val_rmse: 0.4884 - val_mae: 0.2518 - val_mape: 7.7406 - lr: 1.0000e-04
Epoch 613/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2518 - mse: 0.2376
- rmse: 0.4874 - mae: 0.2518 - mape: 7.7880
Epoch 613: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2524 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2524 - mape: 7.8127 - val_loss: 0.2559 - val_mse:
0.2441 - val_rmse: 0.4941 - val_mae: 0.2559 - val_mape: 7.7307 - lr: 1.0000e-04
Epoch 614/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2528 - mse: 0.2404
- rmse: 0.4903 - mae: 0.2528 - mape: 7.8210
Epoch 614: val_loss did not improve from 0.25150

318/318 [=====] - 1s 2ms/step - loss: 0.2529 - mse: 0.2412 - rmse: 0.4912 - mae: 0.2529 - mape: 7.8329 - val_loss: 0.2528 - val_mse: 0.2412 - val_rmse: 0.4911 - val_mae: 0.2528 - val_mape: 7.7396 - lr: 1.0000e-04
Epoch 615/2000
269/318 [=====>...] - ETA: 0s - loss: 0.2529 - mse: 0.2420 - rmse: 0.4919 - mae: 0.2529 - mape: 7.8374
Epoch 615: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2524 - mse: 0.2399 - rmse: 0.4898 - mae: 0.2524 - mape: 7.8178 - val_loss: 0.2522 - val_mse: 0.2382 - val_rmse: 0.4880 - val_mae: 0.2522 - val_mape: 7.7997 - lr: 1.0000e-04
Epoch 616/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2543 - mse: 0.2444 - rmse: 0.4943 - mae: 0.2543 - mape: 7.8814
Epoch 616: val_loss did not improve from 0.25150
318/318 [=====] - 0s 1ms/step - loss: 0.2524 - mse: 0.2406 - rmse: 0.4905 - mae: 0.2524 - mape: 7.8153 - val_loss: 0.2516 - val_mse: 0.2395 - val_rmse: 0.4894 - val_mae: 0.2516 - val_mape: 7.8181 - lr: 1.0000e-04
Epoch 617/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2533 - mse: 0.2419 - rmse: 0.4919 - mae: 0.2533 - mape: 7.8384
Epoch 617: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2521 - mse: 0.2394 - rmse: 0.4893 - mae: 0.2521 - mape: 7.8102 - val_loss: 0.2525 - val_mse: 0.2392 - val_rmse: 0.4890 - val_mae: 0.2525 - val_mape: 7.8501 - lr: 1.0000e-04
Epoch 618/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2532 - mse: 0.2385 - rmse: 0.4883 - mae: 0.2532 - mape: 7.8501
Epoch 618: val_loss did not improve from 0.25150
318/318 [=====] - 0s 1ms/step - loss: 0.2525 - mse: 0.2399 - rmse: 0.4898 - mae: 0.2525 - mape: 7.8232 - val_loss: 0.2518 - val_mse: 0.2397 - val_rmse: 0.4895 - val_mae: 0.2518 - val_mape: 7.8580 - lr: 1.0000e-04
Epoch 619/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2385 - rmse: 0.4883 - mae: 0.2517 - mape: 7.8016
Epoch 619: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2529 - mse: 0.2404 - rmse: 0.4903 - mae: 0.2529 - mape: 7.8320 - val_loss: 0.2519 - val_mse: 0.2399 - val_rmse: 0.4898 - val_mae: 0.2519 - val_mape: 7.8691 - lr: 1.0000e-04
Epoch 620/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2505 - mse: 0.2363 - rmse: 0.4862 - mae: 0.2505 - mape: 7.7703
Epoch 620: val_loss did not improve from 0.25150
318/318 [=====] - 0s 1ms/step - loss: 0.2523 - mse: 0.2402 - rmse: 0.4901 - mae: 0.2523 - mape: 7.8121 - val_loss: 0.2522 - val_mse: 0.2405 - val_rmse: 0.4904 - val_mae: 0.2522 - val_mape: 7.9085 - lr: 1.0000e-04
Epoch 621/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2513 - mse: 0.2381 - rmse: 0.4879 - mae: 0.2513 - mape: 7.8250

Epoch 621: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2525 - mse:
0.2396 - rmse: 0.4895 - mae: 0.2525 - mape: 7.8382 - val_loss: 0.2522 - val_mse:
0.2407 - val_rmse: 0.4906 - val_mae: 0.2522 - val_mape: 7.8575 - lr: 1.0000e-04
Epoch 622/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2532 - mse: 0.2430
- rmse: 0.4930 - mae: 0.2532 - mape: 7.8374
Epoch 622: val_loss did not improve from 0.25150
318/318 [=====] - 0s 1ms/step - loss: 0.2525 - mse:
0.2412 - rmse: 0.4911 - mae: 0.2525 - mape: 7.8267 - val_loss: 0.2517 - val_mse:
0.2390 - val_rmse: 0.4889 - val_mae: 0.2517 - val_mape: 7.7801 - lr: 1.0000e-04
Epoch 623/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2520 - mse: 0.2392
- rmse: 0.4891 - mae: 0.2520 - mape: 7.8125
Epoch 623: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2523 - mse:
0.2406 - rmse: 0.4905 - mae: 0.2523 - mape: 7.8266 - val_loss: 0.2526 - val_mse:
0.2397 - val_rmse: 0.4896 - val_mae: 0.2526 - val_mape: 7.7230 - lr: 1.0000e-04
Epoch 624/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2520 - mse: 0.2390
- rmse: 0.4888 - mae: 0.2520 - mape: 7.8129
Epoch 624: val_loss did not improve from 0.25150
318/318 [=====] - 0s 2ms/step - loss: 0.2521 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2521 - mape: 7.8165 - val_loss: 0.2515 - val_mse:
0.2386 - val_rmse: 0.4885 - val_mae: 0.2515 - val_mape: 7.8084 - lr: 1.0000e-04
Epoch 625/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2531 - mse: 0.2401
- rmse: 0.4900 - mae: 0.2531 - mape: 7.8265
Epoch 625: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2526 - mse:
0.2408 - rmse: 0.4907 - mae: 0.2526 - mape: 7.8213 - val_loss: 0.2518 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2518 - val_mape: 7.7847 - lr: 1.0000e-04
Epoch 626/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2525 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2525 - mape: 7.8306
Epoch 626: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2522 - mse:
0.2393 - rmse: 0.4891 - mae: 0.2522 - mape: 7.8158 - val_loss: 0.2535 - val_mse:
0.2420 - val_rmse: 0.4919 - val_mae: 0.2535 - val_mape: 7.7413 - lr: 1.0000e-04
Epoch 627/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2520 - mse: 0.2403
- rmse: 0.4902 - mae: 0.2520 - mape: 7.8012
Epoch 627: val_loss did not improve from 0.25150
318/318 [=====] - 0s 2ms/step - loss: 0.2525 - mse:
0.2408 - rmse: 0.4907 - mae: 0.2525 - mape: 7.8201 - val_loss: 0.2516 - val_mse:
0.2397 - val_rmse: 0.4896 - val_mae: 0.2516 - val_mape: 7.8247 - lr: 1.0000e-04
Epoch 628/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2522 - mse: 0.2405

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- rmse: 0.4905 - mae: 0.2522 - mape: 7.8053
Epoch 628: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2523 - mse:
0.2406 - rmse: 0.4905 - mae: 0.2523 - mape: 7.8076 - val_loss: 0.2520 - val_mse:
0.2396 - val_rmse: 0.4895 - val_mae: 0.2520 - val_mape: 7.8646 - lr: 1.0000e-04
Epoch 629/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2532 - mse: 0.2412
- rmse: 0.4911 - mae: 0.2532 - mape: 7.8515
Epoch 629: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2521 - mse:
0.2407 - rmse: 0.4906 - mae: 0.2521 - mape: 7.8339 - val_loss: 0.2517 - val_mse:
0.2407 - val_rmse: 0.4906 - val_mae: 0.2517 - val_mape: 7.8528 - lr: 1.0000e-04
Epoch 630/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2522 - mse: 0.2406
- rmse: 0.4905 - mae: 0.2522 - mape: 7.8035
Epoch 630: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2521 - mse:
0.2400 - rmse: 0.4899 - mae: 0.2521 - mape: 7.8016 - val_loss: 0.2525 - val_mse:
0.2406 - val_rmse: 0.4905 - val_mae: 0.2525 - val_mape: 7.9255 - lr: 1.0000e-04
Epoch 631/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2523 - mse: 0.2401
- rmse: 0.4900 - mae: 0.2523 - mape: 7.8194
Epoch 631: val_loss did not improve from 0.25150
318/318 [=====] - 1s 2ms/step - loss: 0.2525 - mse:
0.2403 - rmse: 0.4902 - mae: 0.2525 - mape: 7.8223 - val_loss: 0.2516 - val_mse:
0.2396 - val_rmse: 0.4895 - val_mae: 0.2516 - val_mape: 7.8054 - lr: 1.0000e-04
Epoch 632/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2514 - mse: 0.2392
- rmse: 0.4891 - mae: 0.2514 - mape: 7.7984
Epoch 632: val_loss improved from 0.25150 to 0.25115, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2514 - mse:
0.2392 - rmse: 0.4891 - mae: 0.2514 - mape: 7.7903 - val_loss: 0.2512 - val_mse:
0.2392 - val_rmse: 0.4890 - val_mae: 0.2512 - val_mape: 7.7761 - lr: 1.0000e-05
Epoch 633/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2514 - mse: 0.2394
- rmse: 0.4893 - mae: 0.2514 - mape: 7.7888
Epoch 633: val_loss improved from 0.25115 to 0.25112, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2513 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2513 - mape: 7.7882 - val_loss: 0.2511 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7821 - lr: 1.0000e-05
Epoch 634/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2513 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2513 - mape: 7.7787
Epoch 634: val_loss did not improve from 0.25112
318/318 [=====] - 1s 2ms/step - loss: 0.2513 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2513 - mape: 7.7827 - val_loss: 0.2512 - val_mse:

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0.2391 - val_rmse: 0.4890 - val_mae: 0.2512 - val_mape: 7.8021 - lr: 1.0000e-05
Epoch 635/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2520 - mse: 0.2391
- rmse: 0.4890 - mae: 0.2520 - mape: 7.7929
Epoch 635: val_loss did not improve from 0.25112
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2391 - rmse: 0.4890 - mae: 0.2512 - mape: 7.7796 - val_loss: 0.2512 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2512 - val_mape: 7.8083 - lr: 1.0000e-05
Epoch 636/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2504 - mse: 0.2377
- rmse: 0.4875 - mae: 0.2504 - mape: 7.7593
Epoch 636: val_loss did not improve from 0.25112
318/318 [=====] - 0s 2ms/step - loss: 0.2512 - mse:
0.2392 - rmse: 0.4891 - mae: 0.2512 - mape: 7.7882 - val_loss: 0.2511 - val_mse:
0.2390 - val_rmse: 0.4889 - val_mae: 0.2511 - val_mape: 7.7843 - lr: 1.0000e-05
Epoch 637/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2522 - mse: 0.2411
- rmse: 0.4910 - mae: 0.2522 - mape: 7.8185
Epoch 637: val_loss improved from 0.25112 to 0.25111, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2512 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2512 - mape: 7.7894 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7669 - lr: 1.0000e-05
Epoch 638/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2510 - mse: 0.2398
- rmse: 0.4897 - mae: 0.2510 - mape: 7.7754
Epoch 638: val_loss did not improve from 0.25111
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2390 - rmse: 0.4889 - mae: 0.2512 - mape: 7.7780 - val_loss: 0.2512 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2512 - val_mape: 7.8129 - lr: 1.0000e-05
Epoch 639/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2511 - mse: 0.2381
- rmse: 0.4879 - mae: 0.2511 - mape: 7.7918
Epoch 639: val_loss improved from 0.25111 to 0.25111, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2513 - mse:
0.2394 - rmse: 0.4892 - mae: 0.2513 - mape: 7.7929 - val_loss: 0.2511 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7848 - lr: 1.0000e-05
Epoch 640/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2514 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2514 - mape: 7.8059
Epoch 640: val_loss improved from 0.25111 to 0.25110, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2513 - mse:
0.2394 - rmse: 0.4892 - mae: 0.2513 - mape: 7.7792 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7812 - lr: 1.0000e-05
Epoch 641/2000
273/318 [=====>...] - ETA: 0s - loss: 0.2521 - mse: 0.2404

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- rmse: 0.4903 - mae: 0.2521 - mape: 7.7988
Epoch 641: val_loss improved from 0.25110 to 0.25110, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2512 - mse:
0.2391 - rmse: 0.4890 - mae: 0.2512 - mape: 7.7916 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7806 - lr: 1.0000e-05
Epoch 642/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2514 - mse: 0.2391
- rmse: 0.4889 - mae: 0.2514 - mape: 7.7889
Epoch 642: val_loss improved from 0.25110 to 0.25109, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2513 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2513 - mape: 7.7789 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7781 - lr: 1.0000e-05
Epoch 643/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2505 - mse: 0.2379
- rmse: 0.4877 - mae: 0.2505 - mape: 7.7751
Epoch 643: val_loss did not improve from 0.25109
318/318 [=====] - 0s 1ms/step - loss: 0.2512 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7938 - val_loss: 0.2511 - val_mse:
0.2393 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7879 - lr: 1.0000e-05
Epoch 644/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2522 - mse: 0.2408
- rmse: 0.4907 - mae: 0.2522 - mape: 7.8213
Epoch 644: val_loss did not improve from 0.25109
318/318 [=====] - 1s 2ms/step - loss: 0.2513 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2513 - mape: 7.7889 - val_loss: 0.2511 - val_mse:
0.2393 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7809 - lr: 1.0000e-05
Epoch 645/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2505 - mse: 0.2379
- rmse: 0.4877 - mae: 0.2505 - mape: 7.7626
Epoch 645: val_loss did not improve from 0.25109
318/318 [=====] - 0s 1ms/step - loss: 0.2511 - mse:
0.2390 - rmse: 0.4889 - mae: 0.2511 - mape: 7.7757 - val_loss: 0.2513 - val_mse:
0.2398 - val_rmse: 0.4897 - val_mae: 0.2513 - val_mape: 7.8270 - lr: 1.0000e-05
Epoch 646/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2394
- rmse: 0.4893 - mae: 0.2511 - mape: 7.7871
Epoch 646: val_loss did not improve from 0.25109
318/318 [=====] - 1s 2ms/step - loss: 0.2513 - mse:
0.2396 - rmse: 0.4895 - mae: 0.2513 - mape: 7.7972 - val_loss: 0.2511 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2511 - val_mape: 7.7830 - lr: 1.0000e-05
Epoch 647/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2514 - mse: 0.2397
- rmse: 0.4896 - mae: 0.2514 - mape: 7.7904
Epoch 647: val_loss improved from 0.25109 to 0.25108, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:

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0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7861 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7790 - lr: 1.0000e-05
Epoch 648/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2529 - mse: 0.2432
- rmse: 0.4932 - mae: 0.2529 - mape: 7.8406
Epoch 648: val_loss did not improve from 0.25108
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2512 - mape: 7.7864 - val_loss: 0.2512 - val_mse:
0.2389 - val_rmse: 0.4888 - val_mae: 0.2512 - val_mape: 7.7840 - lr: 1.0000e-05
Epoch 649/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2512 - mse: 0.2392
- rmse: 0.4891 - mae: 0.2512 - mape: 7.7910
Epoch 649: val_loss did not improve from 0.25108
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7818 - val_loss: 0.2511 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2511 - val_mape: 7.7938 - lr: 1.0000e-05
Epoch 650/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2514 - mse: 0.2386
- rmse: 0.4885 - mae: 0.2514 - mape: 7.7914
Epoch 650: val_loss did not improve from 0.25108
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2512 - mape: 7.7914 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7741 - lr: 1.0000e-05
Epoch 651/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2504 - mse: 0.2376
- rmse: 0.4874 - mae: 0.2504 - mape: 7.7584
Epoch 651: val_loss did not improve from 0.25108
318/318 [=====] - 0s 2ms/step - loss: 0.2512 - mse:
0.2392 - rmse: 0.4891 - mae: 0.2512 - mape: 7.7835 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7763 - lr: 1.0000e-05
Epoch 652/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2506 - mse: 0.2382
- rmse: 0.4881 - mae: 0.2506 - mape: 7.7701
Epoch 652: val_loss did not improve from 0.25108
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2512 - mape: 7.7890 - val_loss: 0.2511 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2511 - val_mape: 7.8056 - lr: 1.0000e-05
Epoch 653/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2508 - mse: 0.2379
- rmse: 0.4878 - mae: 0.2508 - mape: 7.7773
Epoch 653: val_loss did not improve from 0.25108
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2512 - mape: 7.7886 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7720 - lr: 1.0000e-05
Epoch 654/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2514 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2514 - mape: 7.7940
Epoch 654: val_loss did not improve from 0.25108

318/318 [=====] - 0s 2ms/step - loss: 0.2513 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2513 - mape: 7.7879 - val_loss: 0.2511 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2511 - val_mape: 7.7672 - lr: 1.0000e-05
Epoch 655/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2505 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2505 - mape: 7.7599
Epoch 655: val_loss did not improve from 0.25108
318/318 [=====] - 0s 2ms/step - loss: 0.2513 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2513 - mape: 7.7842 - val_loss: 0.2511 - val_mse:
0.2391 - val_rmse: 0.4889 - val_mae: 0.2511 - val_mape: 7.7831 - lr: 1.0000e-05
Epoch 656/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2497 - mse: 0.2381
- rmse: 0.4880 - mae: 0.2497 - mape: 7.7538
Epoch 656: val_loss did not improve from 0.25108
318/318 [=====] - 0s 1ms/step - loss: 0.2512 - mse:
0.2392 - rmse: 0.4891 - mae: 0.2512 - mape: 7.7927 - val_loss: 0.2511 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7640 - lr: 1.0000e-05
Epoch 657/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2524 - mse: 0.2411
- rmse: 0.4910 - mae: 0.2524 - mape: 7.8200
Epoch 657: val_loss improved from 0.25108 to 0.25108, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2392 - rmse: 0.4890 - mae: 0.2512 - mape: 7.7765 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7925 - lr: 1.0000e-05
Epoch 658/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2392
- rmse: 0.4891 - mae: 0.2511 - mape: 7.7772
Epoch 658: val_loss did not improve from 0.25108
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7839 - val_loss: 0.2511 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2511 - val_mape: 7.8002 - lr: 1.0000e-05
Epoch 659/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2511 - mse: 0.2371
- rmse: 0.4870 - mae: 0.2511 - mape: 7.7696
Epoch 659: val_loss did not improve from 0.25108
318/318 [=====] - 0s 1ms/step - loss: 0.2513 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2513 - mape: 7.7918 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7864 - lr: 1.0000e-05
Epoch 660/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2504 - mse: 0.2376
- rmse: 0.4874 - mae: 0.2504 - mape: 7.7645
Epoch 660: val_loss did not improve from 0.25108
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7886 - val_loss: 0.2511 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7667 - lr: 1.0000e-05
Epoch 661/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2505 - mse: 0.2382

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- rmse: 0.4880 - mae: 0.2505 - mape: 7.7699
Epoch 661: val_loss did not improve from 0.25108
318/318 [=====] - 0s 1ms/step - loss: 0.2511 - mse:
0.2391 - rmse: 0.4890 - mae: 0.2511 - mape: 7.7818 - val_loss: 0.2512 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2512 - val_mape: 7.8145 - lr: 1.0000e-05
Epoch 662/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2531 - mse: 0.2424
- rmse: 0.4923 - mae: 0.2531 - mape: 7.8520
Epoch 662: val_loss did not improve from 0.25108
318/318 [=====] - 0s 1ms/step - loss: 0.2512 - mse:
0.2392 - rmse: 0.4891 - mae: 0.2512 - mape: 7.7915 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7852 - lr: 1.0000e-05
Epoch 663/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2510 - mse: 0.2389
- rmse: 0.4888 - mae: 0.2510 - mape: 7.7897
Epoch 663: val_loss improved from 0.25108 to 0.25106, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7891 - val_loss: 0.2511 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7755 - lr: 1.0000e-05
Epoch 664/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2513 - mse: 0.2385
- rmse: 0.4884 - mae: 0.2513 - mape: 7.8114
Epoch 664: val_loss did not improve from 0.25106
318/318 [=====] - 0s 1ms/step - loss: 0.2512 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7900 - val_loss: 0.2511 - val_mse:
0.2391 - val_rmse: 0.4889 - val_mae: 0.2511 - val_mape: 7.7824 - lr: 1.0000e-05
Epoch 665/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2521 - mse: 0.2418
- rmse: 0.4917 - mae: 0.2521 - mape: 7.8092
Epoch 665: val_loss did not improve from 0.25106
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2512 - mape: 7.7852 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7698 - lr: 1.0000e-05
Epoch 666/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2506 - mse: 0.2384
- rmse: 0.4883 - mae: 0.2506 - mape: 7.7733
Epoch 666: val_loss improved from 0.25106 to 0.25106, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2512 - mape: 7.7909 - val_loss: 0.2511 - val_mse:
0.2391 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7757 - lr: 1.0000e-05
Epoch 667/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2511 - mse: 0.2384
- rmse: 0.4883 - mae: 0.2511 - mape: 7.7738
Epoch 667: val_loss did not improve from 0.25106
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2512 - mape: 7.7845 - val_loss: 0.2511 - val_mse:

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0.2393 - val_rmse: 0.4892 - val_mae: 0.2511 - val_mape: 7.8014 - lr: 1.0000e-05
Epoch 668/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2518 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2518 - mape: 7.8148
Epoch 668: val_loss did not improve from 0.25106
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2392 - rmse: 0.4891 - mae: 0.2512 - mape: 7.7966 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7660 - lr: 1.0000e-05
Epoch 669/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2510 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2510 - mape: 7.7998
Epoch 669: val_loss improved from 0.25106 to 0.25104, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2392 - rmse: 0.4891 - mae: 0.2512 - mape: 7.7865 - val_loss: 0.2510 - val_mse:
0.2392 - val_rmse: 0.4890 - val_mae: 0.2510 - val_mape: 7.7732 - lr: 1.0000e-05
Epoch 670/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2514 - mse: 0.2398
- rmse: 0.4897 - mae: 0.2514 - mape: 7.7991
Epoch 670: val_loss did not improve from 0.25104
318/318 [=====] - 1s 2ms/step - loss: 0.2513 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2513 - mape: 7.7880 - val_loss: 0.2510 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2510 - val_mape: 7.7842 - lr: 1.0000e-05
Epoch 671/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2512 - mse: 0.2385
- rmse: 0.4883 - mae: 0.2512 - mape: 7.7811
Epoch 671: val_loss did not improve from 0.25104
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7818 - val_loss: 0.2511 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2511 - val_mape: 7.8029 - lr: 1.0000e-05
Epoch 672/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2513 - mse: 0.2397
- rmse: 0.4896 - mae: 0.2513 - mape: 7.7970
Epoch 672: val_loss did not improve from 0.25104
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7933 - val_loss: 0.2511 - val_mse:
0.2390 - val_rmse: 0.4889 - val_mae: 0.2511 - val_mape: 7.7679 - lr: 1.0000e-05
Epoch 673/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2515 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2515 - mape: 7.7749
Epoch 673: val_loss did not improve from 0.25104
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2396 - rmse: 0.4895 - mae: 0.2511 - mape: 7.7798 - val_loss: 0.2511 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2511 - val_mape: 7.8049 - lr: 1.0000e-05
Epoch 674/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2513 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2513 - mape: 7.8025
Epoch 674: val_loss did not improve from 0.25104

318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse: 0.2395 - rmse: 0.4894 - mae: 0.2512 - mape: 7.7847 - val_loss: 0.2512 - val_mse: 0.2395 - val_rmse: 0.4894 - val_mae: 0.2512 - val_mape: 7.8035 - lr: 1.0000e-05
Epoch 675/2000

309/318 [=====>.] - ETA: 0s - loss: 0.2515 - mse: 0.2398 - rmse: 0.4897 - mae: 0.2515 - mape: 7.8116
Epoch 675: val_loss did not improve from 0.25104

318/318 [=====] - 0s 2ms/step - loss: 0.2513 - mse: 0.2396 - rmse: 0.4895 - mae: 0.2513 - mape: 7.7975 - val_loss: 0.2511 - val_mse: 0.2394 - val_rmse: 0.4893 - val_mae: 0.2511 - val_mape: 7.7591 - lr: 1.0000e-05
Epoch 676/2000

284/318 [=====>...] - ETA: 0s - loss: 0.2519 - mse: 0.2422 - rmse: 0.4922 - mae: 0.2519 - mape: 7.8034
Epoch 676: val_loss did not improve from 0.25104

318/318 [=====] - 0s 1ms/step - loss: 0.2512 - mse: 0.2395 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7836 - val_loss: 0.2511 - val_mse: 0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7623 - lr: 1.0000e-05
Epoch 677/2000

294/318 [=====>...] - ETA: 0s - loss: 0.2500 - mse: 0.2373 - rmse: 0.4871 - mae: 0.2500 - mape: 7.7483
Epoch 677: val_loss improved from 0.25104 to 0.25103, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse: 0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7837 - val_loss: 0.2510 - val_mse: 0.2393 - val_rmse: 0.4892 - val_mae: 0.2510 - val_mape: 7.7669 - lr: 1.0000e-05
Epoch 678/2000

263/318 [=====>...] - ETA: 0s - loss: 0.2531 - mse: 0.2432 - rmse: 0.4932 - mae: 0.2531 - mape: 7.8467
Epoch 678: val_loss improved from 0.25103 to 0.25101, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5

318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse: 0.2393 - rmse: 0.4892 - mae: 0.2512 - mape: 7.7805 - val_loss: 0.2510 - val_mse: 0.2392 - val_rmse: 0.4891 - val_mae: 0.2510 - val_mape: 7.7827 - lr: 1.0000e-05
Epoch 679/2000

268/318 [=====>...] - ETA: 0s - loss: 0.2495 - mse: 0.2362 - rmse: 0.4860 - mae: 0.2495 - mape: 7.7470
Epoch 679: val_loss did not improve from 0.25101

318/318 [=====] - 0s 1ms/step - loss: 0.2512 - mse: 0.2394 - rmse: 0.4893 - mae: 0.2512 - mape: 7.7912 - val_loss: 0.2511 - val_mse: 0.2393 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7551 - lr: 1.0000e-05
Epoch 680/2000

296/318 [=====>...] - ETA: 0s - loss: 0.2524 - mse: 0.2422 - rmse: 0.4922 - mae: 0.2524 - mape: 7.8178
Epoch 680: val_loss did not improve from 0.25101

318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse: 0.2396 - rmse: 0.4895 - mae: 0.2511 - mape: 7.7803 - val_loss: 0.2510 - val_mse: 0.2393 - val_rmse: 0.4892 - val_mae: 0.2510 - val_mape: 7.7732 - lr: 1.0000e-05
Epoch 681/2000

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278/318 [=====>...] - ETA: 0s - loss: 0.2505 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2505 - mape: 7.7517
Epoch 681: val_loss improved from 0.25101 to 0.25101, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2512 - mse:
0.2396 - rmse: 0.4894 - mae: 0.2512 - mape: 7.7803 - val_loss: 0.2510 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2510 - val_mape: 7.7781 - lr: 1.0000e-05
Epoch 682/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2502 - mse: 0.2384
- rmse: 0.4883 - mae: 0.2502 - mape: 7.7628
Epoch 682: val_loss improved from 0.25101 to 0.25100, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2396 - rmse: 0.4894 - mae: 0.2512 - mape: 7.7843 - val_loss: 0.2510 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2510 - val_mape: 7.7771 - lr: 1.0000e-05
Epoch 683/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2510 - mse: 0.2383
- rmse: 0.4882 - mae: 0.2510 - mape: 7.7689
Epoch 683: val_loss did not improve from 0.25100
318/318 [=====] - 0s 1ms/step - loss: 0.2511 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2511 - mape: 7.7814 - val_loss: 0.2511 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2511 - val_mape: 7.8105 - lr: 1.0000e-05
Epoch 684/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2509 - mse: 0.2403
- rmse: 0.4902 - mae: 0.2509 - mape: 7.7806
Epoch 684: val_loss did not improve from 0.25100
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2512 - mape: 7.7932 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4890 - val_mae: 0.2511 - val_mape: 7.7558 - lr: 1.0000e-05
Epoch 685/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2514 - mse: 0.2401
- rmse: 0.4900 - mae: 0.2514 - mape: 7.7880
Epoch 685: val_loss improved from 0.25100 to 0.25100, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2511 - mape: 7.7814 - val_loss: 0.2510 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2510 - val_mape: 7.7850 - lr: 1.0000e-05
Epoch 686/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2537 - mse: 0.2439
- rmse: 0.4939 - mae: 0.2537 - mape: 7.8661
Epoch 686: val_loss did not improve from 0.25100
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2511 - mape: 7.7775 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7877 - lr: 1.0000e-05
Epoch 687/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2514 - mse: 0.2397
- rmse: 0.4895 - mae: 0.2514 - mape: 7.7927
Epoch 687: val_loss did not improve from 0.25100

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318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2396 - rmse: 0.4895 - mae: 0.2511 - mape: 7.7874 - val_loss: 0.2511 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2511 - val_mape: 7.7948 - lr: 1.0000e-05
Epoch 688/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2510 - mse: 0.2389
- rmse: 0.4887 - mae: 0.2510 - mape: 7.7910
Epoch 688: val_loss improved from 0.25100 to 0.25099, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2396 - rmse: 0.4895 - mae: 0.2512 - mape: 7.7872 - val_loss: 0.2510 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2510 - val_mape: 7.7710 - lr: 1.0000e-05
Epoch 689/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2511 - mse: 0.2388
- rmse: 0.4886 - mae: 0.2511 - mape: 7.7916
Epoch 689: val_loss did not improve from 0.25099
318/318 [=====] - 0s 2ms/step - loss: 0.2512 - mse:
0.2397 - rmse: 0.4896 - mae: 0.2512 - mape: 7.7851 - val_loss: 0.2510 - val_mse:
0.2392 - val_rmse: 0.4891 - val_mae: 0.2510 - val_mape: 7.7779 - lr: 1.0000e-05
Epoch 690/2000
298/318 [=====>..] - ETA: 0s - loss: 0.2513 - mse: 0.2399
- rmse: 0.4898 - mae: 0.2513 - mape: 7.7672
Epoch 690: val_loss did not improve from 0.25099
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2511 - mape: 7.7730 - val_loss: 0.2511 - val_mse:
0.2398 - val_rmse: 0.4896 - val_mae: 0.2511 - val_mape: 7.8189 - lr: 1.0000e-05
Epoch 691/2000
309/318 [=====>..] - ETA: 0s - loss: 0.2509 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2509 - mape: 7.7732
Epoch 691: val_loss did not improve from 0.25099
318/318 [=====] - 0s 2ms/step - loss: 0.2511 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2511 - mape: 7.7863 - val_loss: 0.2510 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2510 - val_mape: 7.7984 - lr: 1.0000e-05
Epoch 692/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2498 - mse: 0.2376
- rmse: 0.4874 - mae: 0.2498 - mape: 7.7406
Epoch 692: val_loss improved from 0.25099 to 0.25099, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2397 - rmse: 0.4896 - mae: 0.2511 - mape: 7.7854 - val_loss: 0.2510 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2510 - val_mape: 7.7845 - lr: 1.0000e-05
Epoch 693/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2523 - mse: 0.2415
- rmse: 0.4914 - mae: 0.2523 - mape: 7.8258
Epoch 693: val_loss improved from 0.25099 to 0.25099, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2511 - mape: 7.7821 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7817 - lr: 1.0000e-05

Epoch 694/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2524 - mse: 0.2404
- rmse: 0.4903 - mae: 0.2524 - mape: 7.8081
Epoch 694: val_loss did not improve from 0.25099
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2511 - mape: 7.7858 - val_loss: 0.2511 - val_mse:
0.2396 - val_rmse: 0.4895 - val_mae: 0.2511 - val_mape: 7.8020 - lr: 1.0000e-05
Epoch 695/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2504 - mse: 0.2377
- rmse: 0.4876 - mae: 0.2504 - mape: 7.7633
Epoch 695: val_loss did not improve from 0.25099
318/318 [=====] - 0s 1ms/step - loss: 0.2512 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2512 - mape: 7.7849 - val_loss: 0.2510 - val_mse:
0.2396 - val_rmse: 0.4895 - val_mae: 0.2510 - val_mape: 7.7852 - lr: 1.0000e-05
Epoch 696/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2513 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2513 - mape: 7.8043
Epoch 696: val_loss did not improve from 0.25099
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2396 - rmse: 0.4895 - mae: 0.2512 - mape: 7.7863 - val_loss: 0.2510 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2510 - val_mape: 7.7768 - lr: 1.0000e-05
Epoch 697/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2512 - mse: 0.2396
- rmse: 0.4895 - mae: 0.2512 - mape: 7.7846
Epoch 697: val_loss improved from 0.25099 to 0.25098, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2511 - mape: 7.7832 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7805 - lr: 1.0000e-05
Epoch 698/2000
273/318 [=====>...] - ETA: 0s - loss: 0.2518 - mse: 0.2403
- rmse: 0.4902 - mae: 0.2518 - mape: 7.8001
Epoch 698: val_loss did not improve from 0.25098
318/318 [=====] - 0s 1ms/step - loss: 0.2511 - mse:
0.2396 - rmse: 0.4895 - mae: 0.2511 - mape: 7.7782 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7915 - lr: 1.0000e-05
Epoch 699/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2516 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2516 - mape: 7.7793
Epoch 699: val_loss did not improve from 0.25098
318/318 [=====] - 0s 2ms/step - loss: 0.2511 - mse:
0.2397 - rmse: 0.4896 - mae: 0.2511 - mape: 7.7813 - val_loss: 0.2510 - val_mse:
0.2396 - val_rmse: 0.4895 - val_mae: 0.2510 - val_mape: 7.7982 - lr: 1.0000e-05
Epoch 700/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2519 - mse: 0.2415
- rmse: 0.4914 - mae: 0.2519 - mape: 7.8017
Epoch 700: val_loss did not improve from 0.25098
318/318 [=====] - 0s 2ms/step - loss: 0.2511 - mse:

0.2396 - rmse: 0.4895 - mae: 0.2511 - mape: 7.7862 - val_loss: 0.2512 - val_mse:
0.2397 - val_rmse: 0.4896 - val_mae: 0.2512 - val_mape: 7.7550 - lr: 1.0000e-05
Epoch 701/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2510 - mse: 0.2380
- rmse: 0.4878 - mae: 0.2510 - mape: 7.7822
Epoch 701: val_loss did not improve from 0.25098
318/318 [=====] - 0s 1ms/step - loss: 0.2511 - mse:
0.2397 - rmse: 0.4896 - mae: 0.2511 - mape: 7.7786 - val_loss: 0.2510 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2510 - val_mape: 7.7726 - lr: 1.0000e-05
Epoch 702/2000
270/318 [=====>...] - ETA: 0s - loss: 0.2537 - mse: 0.2449
- rmse: 0.4949 - mae: 0.2537 - mape: 7.8400
Epoch 702: val_loss improved from 0.25098 to 0.25097, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2398 - rmse: 0.4897 - mae: 0.2511 - mape: 7.7844 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7840 - lr: 1.0000e-05
Epoch 703/2000
268/318 [=====>...] - ETA: 0s - loss: 0.2491 - mse: 0.2368
- rmse: 0.4866 - mae: 0.2491 - mape: 7.7454
Epoch 703: val_loss did not improve from 0.25097
318/318 [=====] - 0s 2ms/step - loss: 0.2511 - mse:
0.2397 - rmse: 0.4896 - mae: 0.2511 - mape: 7.7839 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7781 - lr: 1.0000e-05
Epoch 704/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2511 - mse: 0.2398
- rmse: 0.4897 - mae: 0.2511 - mape: 7.7959
Epoch 704: val_loss did not improve from 0.25097
318/318 [=====] - 0s 1ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7907 - val_loss: 0.2513 - val_mse:
0.2398 - val_rmse: 0.4897 - val_mae: 0.2513 - val_mape: 7.7387 - lr: 1.0000e-05
Epoch 705/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2507 - mse: 0.2394
- rmse: 0.4893 - mae: 0.2507 - mape: 7.7668
Epoch 705: val_loss improved from 0.25097 to 0.25097, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2512 - mse:
0.2397 - rmse: 0.4896 - mae: 0.2512 - mape: 7.7786 - val_loss: 0.2510 - val_mse:
0.2393 - val_rmse: 0.4892 - val_mae: 0.2510 - val_mape: 7.7784 - lr: 1.0000e-05
Epoch 706/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2503 - mse: 0.2394
- rmse: 0.4893 - mae: 0.2503 - mape: 7.7495
Epoch 706: val_loss did not improve from 0.25097
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2396 - rmse: 0.4895 - mae: 0.2510 - mape: 7.7770 - val_loss: 0.2512 - val_mse:
0.2400 - val_rmse: 0.4899 - val_mae: 0.2512 - val_mape: 7.8286 - lr: 1.0000e-05
Epoch 707/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2513 - mse: 0.2392

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- rmse: 0.4891 - mae: 0.2513 - mape: 7.8023
Epoch 707: val_loss did not improve from 0.25097
318/318 [=====] - 1s 2ms/step - loss: 0.2511 - mse:
0.2397 - rmse: 0.4896 - mae: 0.2511 - mape: 7.7961 - val_loss: 0.2511 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2511 - val_mape: 7.7604 - lr: 1.0000e-05
Epoch 708/2000
294/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2406
- rmse: 0.4905 - mae: 0.2517 - mape: 7.7994
Epoch 708: val_loss did not improve from 0.25097
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7780 - val_loss: 0.2510 - val_mse:
0.2396 - val_rmse: 0.4895 - val_mae: 0.2510 - val_mape: 7.8064 - lr: 1.0000e-05
Epoch 709/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2509 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2509 - mape: 7.7883
Epoch 709: val_loss did not improve from 0.25097
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2393 - rmse: 0.4892 - mae: 0.2510 - mape: 7.7882 - val_loss: 0.2512 - val_mse:
0.2400 - val_rmse: 0.4899 - val_mae: 0.2512 - val_mape: 7.8278 - lr: 1.0000e-05
Epoch 710/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2508 - mse: 0.2391
- rmse: 0.4890 - mae: 0.2508 - mape: 7.8081
Epoch 710: val_loss did not improve from 0.25097
318/318 [=====] - 0s 2ms/step - loss: 0.2511 - mse:
0.2398 - rmse: 0.4897 - mae: 0.2511 - mape: 7.8162 - val_loss: 0.2511 - val_mse:
0.2397 - val_rmse: 0.4895 - val_mae: 0.2511 - val_mape: 7.8087 - lr: 1.0000e-06
Epoch 711/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2509 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2509 - mape: 7.7974
Epoch 711: val_loss did not improve from 0.25097
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2397 - rmse: 0.4895 - mae: 0.2510 - mape: 7.8067 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7969 - lr: 1.0000e-06
Epoch 712/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2510 - mse: 0.2399
- rmse: 0.4898 - mae: 0.2510 - mape: 7.7880
Epoch 712: val_loss improved from 0.25097 to 0.25097, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7911 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7866 - lr: 1.0000e-06
Epoch 713/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2507 - mse: 0.2385
- rmse: 0.4884 - mae: 0.2507 - mape: 7.7789
Epoch 713: val_loss improved from 0.25097 to 0.25096, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7855 - val_loss: 0.2510 - val_mse:

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0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7836 - lr: 1.0000e-06
Epoch 714/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2488 - mse: 0.2351
- rmse: 0.4849 - mae: 0.2488 - mape: 7.7363
Epoch 714: val_loss improved from 0.25096 to 0.25096, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7811 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7830 - lr: 1.0000e-06
Epoch 715/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2500 - mse: 0.2377
- rmse: 0.4876 - mae: 0.2500 - mape: 7.7586
Epoch 715: val_loss improved from 0.25096 to 0.25096, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7820 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7808 - lr: 1.0000e-06
Epoch 716/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2509 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2509 - mape: 7.7887
Epoch 716: val_loss improved from 0.25096 to 0.25096, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7801 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7787 - lr: 1.0000e-06
Epoch 717/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2512 - mse: 0.2410
- rmse: 0.4910 - mae: 0.2512 - mape: 7.7906
Epoch 717: val_loss improved from 0.25096 to 0.25096, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7790 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7807 - lr: 1.0000e-06
Epoch 718/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2510 - mse: 0.2398
- rmse: 0.4897 - mae: 0.2510 - mape: 7.7793
Epoch 718: val_loss did not improve from 0.25096
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7802 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7827 - lr: 1.0000e-06
Epoch 719/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2505 - mse: 0.2404
- rmse: 0.4903 - mae: 0.2505 - mape: 7.7732
Epoch 719: val_loss improved from 0.25096 to 0.25096, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7825 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7809 - lr: 1.0000e-06

Epoch 720/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2518 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2518 - mape: 7.7830
Epoch 720: val_loss improved from 0.25096 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7824 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7805 - lr: 1.0000e-06
Epoch 721/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2501 - mse: 0.2388
- rmse: 0.4887 - mae: 0.2501 - mape: 7.7543
Epoch 721: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7797 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7790 - lr: 1.0000e-06
Epoch 722/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2511 - mape: 7.7788
Epoch 722: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7767 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7805 - lr: 1.0000e-06
Epoch 723/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2512 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2512 - mape: 7.7895
Epoch 723: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7798 - val_loss: 0.2510 - val_mse:
0.2394 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7790 - lr: 1.0000e-06
Epoch 724/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2501 - mse: 0.2376
- rmse: 0.4875 - mae: 0.2501 - mape: 7.7413
Epoch 724: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7783 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7804 - lr: 1.0000e-06
Epoch 725/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2495 - mse: 0.2364
- rmse: 0.4862 - mae: 0.2495 - mape: 7.7304
Epoch 725: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7795 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7781 - lr: 1.0000e-06
Epoch 726/2000

311/318 [=====>.] - ETA: 0s - loss: 0.2515 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2515 - mape: 7.7956
Epoch 726: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2394 - rmse: 0.4893 - mae: 0.2510 - mape: 7.7798 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7794 - lr: 1.0000e-06
Epoch 727/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2505 - mse: 0.2391
- rmse: 0.4890 - mae: 0.2505 - mape: 7.7655
Epoch 727: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7811 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7785 - lr: 1.0000e-06
Epoch 728/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2509 - mse: 0.2398
- rmse: 0.4897 - mae: 0.2509 - mape: 7.7568
Epoch 728: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7762 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7789 - lr: 1.0000e-06
Epoch 729/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2396
- rmse: 0.4894 - mae: 0.2517 - mape: 7.8049
Epoch 729: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7765 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7789 - lr: 1.0000e-06
Epoch 730/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2507 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2507 - mape: 7.7743
Epoch 730: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7811 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7789 - lr: 1.0000e-06
Epoch 731/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2508 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2508 - mape: 7.7683
Epoch 731: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7790 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7784 - lr: 1.0000e-06
Epoch 732/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2506 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2506 - mape: 7.7755

Epoch 732: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7796 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4893 - val_mae: 0.2510 - val_mape: 7.7779 - lr: 1.0000e-06
Epoch 733/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2497 - mse: 0.2366
- rmse: 0.4865 - mae: 0.2497 - mape: 7.7394
Epoch 733: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7800 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7786 - lr: 1.0000e-06
Epoch 734/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2511 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2511 - mape: 7.7976
Epoch 734: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7804 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7779 - lr: 1.0000e-06
Epoch 735/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2521 - mse: 0.2415
- rmse: 0.4914 - mae: 0.2521 - mape: 7.7944
Epoch 735: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7795 - val_loss: 0.2510 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2510 - val_mape: 7.7790 - lr: 1.0000e-06
Epoch 736/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2511 - mape: 7.7850
Epoch 736: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7779 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7789 - lr: 1.0000e-06
Epoch 737/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2524 - mse: 0.2404
- rmse: 0.4903 - mae: 0.2524 - mape: 7.7982
Epoch 737: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7790 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7797 - lr: 1.0000e-06
Epoch 738/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2504 - mse: 0.2385
- rmse: 0.4884 - mae: 0.2504 - mape: 7.7711
Epoch 738: val_loss improved from 0.25095 to 0.25095, saving model to

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model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7803 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7786 - lr: 1.0000e-06
Epoch 739/2000
270/318 [=====>...] - ETA: 0s - loss: 0.2508 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2508 - mape: 7.7901
Epoch 739: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7781 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7777 - lr: 1.0000e-06
Epoch 740/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2524 - mse: 0.2434
- rmse: 0.4934 - mae: 0.2524 - mape: 7.8206
Epoch 740: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7789 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7765 - lr: 1.0000e-06
Epoch 741/2000
298/318 [=====>..] - ETA: 0s - loss: 0.2515 - mse: 0.2397
- rmse: 0.4896 - mae: 0.2515 - mape: 7.7951
Epoch 741: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7756 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7799 - lr: 1.0000e-06
Epoch 742/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2522 - mse: 0.2412
- rmse: 0.4911 - mae: 0.2522 - mape: 7.8161
Epoch 742: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7814 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7806 - lr: 1.0000e-06
Epoch 743/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2507 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2507 - mape: 7.7665
Epoch 743: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7801 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7784 - lr: 1.0000e-06
Epoch 744/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2515 - mse: 0.2404
- rmse: 0.4903 - mae: 0.2515 - mape: 7.7875
Epoch 744: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7777 - val_loss: 0.2509 - val_mse:

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0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7786 - lr: 1.0000e-06
Epoch 745/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2510 - mse: 0.2396
- rmse: 0.4895 - mae: 0.2510 - mape: 7.7808
Epoch 745: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7789 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7800 - lr: 1.0000e-06
Epoch 746/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2513 - mse: 0.2411
- rmse: 0.4910 - mae: 0.2513 - mape: 7.7875
Epoch 746: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7786 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7803 - lr: 1.0000e-06
Epoch 747/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2511 - mse: 0.2407
- rmse: 0.4906 - mae: 0.2511 - mape: 7.7855
Epoch 747: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7827 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7780 - lr: 1.0000e-06
Epoch 748/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2521 - mse: 0.2408
- rmse: 0.4907 - mae: 0.2521 - mape: 7.8214
Epoch 748: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7772 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7783 - lr: 1.0000e-06
Epoch 749/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2508 - mse: 0.2381
- rmse: 0.4879 - mae: 0.2508 - mape: 7.7929
Epoch 749: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7758 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7778 - lr: 1.0000e-06
Epoch 750/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2520 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2520 - mape: 7.8091
Epoch 750: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7781 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7781 - lr: 1.0000e-07
Epoch 751/2000

296/318 [=====>...] - ETA: 0s - loss: 0.2520 - mse: 0.2408
- rmse: 0.4907 - mae: 0.2520 - mape: 7.8068
Epoch 751: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7778 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7781 - lr: 1.0000e-07
Epoch 752/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2499 - mse: 0.2374
- rmse: 0.4873 - mae: 0.2499 - mape: 7.7545
Epoch 752: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7781 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7782 - lr: 1.0000e-07
Epoch 753/2000
271/318 [=====>...] - ETA: 0s - loss: 0.2507 - mse: 0.2396
- rmse: 0.4895 - mae: 0.2507 - mape: 7.7605
Epoch 753: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7784 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7782 - lr: 1.0000e-07
Epoch 754/2000
302/318 [=====>..] - ETA: 0s - loss: 0.2506 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2506 - mape: 7.7872
Epoch 754: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7780 - lr: 1.0000e-07
Epoch 755/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2508 - mse: 0.2393
- rmse: 0.4891 - mae: 0.2508 - mape: 7.7666
Epoch 755: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7784 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7781 - lr: 1.0000e-07
Epoch 756/2000
270/318 [=====>...] - ETA: 0s - loss: 0.2524 - mse: 0.2411
- rmse: 0.4910 - mae: 0.2524 - mape: 7.8253
Epoch 756: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2510 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2510 - mape: 7.7783 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7781 - lr: 1.0000e-07
Epoch 757/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2418

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- rmse: 0.4917 - mae: 0.2517 - mape: 7.8028
Epoch 757: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7782 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7783 - lr: 1.0000e-07
Epoch 758/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2530 - mse: 0.2451
- rmse: 0.4951 - mae: 0.2530 - mape: 7.8333
Epoch 758: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7783 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7783 - lr: 1.0000e-07
Epoch 759/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2493 - mse: 0.2358
- rmse: 0.4856 - mae: 0.2493 - mape: 7.7357
Epoch 759: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7783 - lr: 1.0000e-07
Epoch 760/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2508 - mse: 0.2391
- rmse: 0.4890 - mae: 0.2508 - mape: 7.7685
Epoch 760: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-07
Epoch 761/2000
261/318 [=====>...] - ETA: 0s - loss: 0.2526 - mse: 0.2408
- rmse: 0.4907 - mae: 0.2526 - mape: 7.8203
Epoch 761: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7787 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 762/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2512 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2512 - mape: 7.7902
Epoch 762: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7787 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 763/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2505 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2505 - mape: 7.7658
Epoch 763: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:

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0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7789 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7786 - lr: 1.0000e-07
Epoch 764/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2510 - mse: 0.2394
- rmse: 0.4893 - mae: 0.2510 - mape: 7.7820
Epoch 764: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7784 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7784 - lr: 1.0000e-07
Epoch 765/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2509 - mse: 0.2398
- rmse: 0.4897 - mae: 0.2509 - mape: 7.7764
Epoch 765: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7788 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-07
Epoch 766/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2512 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2512 - mape: 7.7875
Epoch 766: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7791 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 767/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2520 - mse: 0.2415
- rmse: 0.4915 - mae: 0.2520 - mape: 7.8085
Epoch 767: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7787 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-07
Epoch 768/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2511 - mape: 7.7829
Epoch 768: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7788 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7786 - lr: 1.0000e-07
Epoch 769/2000
262/318 [=====>...] - ETA: 0s - loss: 0.2530 - mse: 0.2411
- rmse: 0.4910 - mae: 0.2530 - mape: 7.8299
Epoch 769: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7787 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 770/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2508 - mse: 0.2378
- rmse: 0.4876 - mae: 0.2508 - mape: 7.7768
Epoch 770: val_loss improved from 0.25095 to 0.25095, saving model to

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model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7788 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7786 - lr: 1.0000e-07
Epoch 771/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2504 - mse: 0.2372
- rmse: 0.4870 - mae: 0.2504 - mape: 7.7672
Epoch 771: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7786 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7788 - lr: 1.0000e-07
Epoch 772/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2516 - mse: 0.2413
- rmse: 0.4912 - mae: 0.2516 - mape: 7.7865
Epoch 772: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7787 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7788 - lr: 1.0000e-07
Epoch 773/2000
268/318 [=====>...] - ETA: 0s - loss: 0.2503 - mse: 0.2382
- rmse: 0.4881 - mae: 0.2503 - mape: 7.7608
Epoch 773: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 774/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2507 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2507 - mape: 7.7417
Epoch 774: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7788 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7789 - lr: 1.0000e-07
Epoch 775/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2509 - mse: 0.2398
- rmse: 0.4897 - mae: 0.2509 - mape: 7.7663
Epoch 775: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7791 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7789 - lr: 1.0000e-07
Epoch 776/2000
265/318 [=====>...] - ETA: 0s - loss: 0.2502 - mse: 0.2399
- rmse: 0.4898 - mae: 0.2502 - mape: 7.7551
Epoch 776: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7789 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7788 - lr: 1.0000e-07

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Epoch 777/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2527 - mse: 0.2424
- rmse: 0.4923 - mae: 0.2527 - mape: 7.8251
Epoch 777: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7788 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7788 - lr: 1.0000e-07
Epoch 778/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2500 - mse: 0.2382
- rmse: 0.4881 - mae: 0.2500 - mape: 7.7585
Epoch 778: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7789 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7786 - lr: 1.0000e-07
Epoch 779/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2521 - mse: 0.2428
- rmse: 0.4927 - mae: 0.2521 - mape: 7.8331
Epoch 779: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7786 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-07
Epoch 780/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2520 - mse: 0.2406
- rmse: 0.4905 - mae: 0.2520 - mape: 7.8272
Epoch 780: val_loss improved from 0.25095 to 0.25095, saving model to
model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7784 - lr: 1.0000e-07
Epoch 781/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2505 - mse: 0.2388
- rmse: 0.4886 - mae: 0.2505 - mape: 7.7666
Epoch 781: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7787 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7784 - lr: 1.0000e-07
Epoch 782/2000
295/318 [=====>...] - ETA: 0s - loss: 0.2514 - mse: 0.2399
- rmse: 0.4898 - mae: 0.2514 - mape: 7.7841
Epoch 782: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7787 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7786 - lr: 1.0000e-07
Epoch 783/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2512 - mse: 0.2401
- rmse: 0.4900 - mae: 0.2512 - mape: 7.7915

Epoch 783: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse: 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7784 - val_loss: 0.2509 - val_mse: 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 784/2000
299/318 [=====>..] - ETA: 0s - loss: 0.2515 - mse: 0.2398 - rmse: 0.4897 - mae: 0.2515 - mape: 7.7883
Epoch 784: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse: 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7784 - val_loss: 0.2509 - val_mse: 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 785/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2508 - mse: 0.2398 - rmse: 0.4897 - mae: 0.2508 - mape: 7.7730
Epoch 785: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse: 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7787 - val_loss: 0.2509 - val_mse: 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 786/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2507 - mse: 0.2385 - rmse: 0.4883 - mae: 0.2507 - mape: 7.7840
Epoch 786: val_loss improved from 0.25095 to 0.25095, saving model to model_weights/20221123-225504_mlp_best_weights.hdf5
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse: 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7786 - val_loss: 0.2509 - val_mse: 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7786 - lr: 1.0000e-07
Epoch 787/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2519 - mse: 0.2415 - rmse: 0.4915 - mae: 0.2519 - mape: 7.8037
Epoch 787: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse: 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7786 - val_loss: 0.2509 - val_mse: 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 788/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2509 - mse: 0.2396 - rmse: 0.4895 - mae: 0.2509 - mape: 7.7766
Epoch 788: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse: 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7789 - val_loss: 0.2509 - val_mse: 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7787 - lr: 1.0000e-07
Epoch 789/2000
308/318 [=====>..] - ETA: 0s - loss: 0.2507 - mse: 0.2394 - rmse: 0.4893 - mae: 0.2507 - mape: 7.7746
Epoch 789: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse: 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7784 - val_loss: 0.2509 - val_mse: 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-07
Epoch 790/2000

290/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2412
- rmse: 0.4911 - mae: 0.2517 - mape: 7.7804
Epoch 790: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 791/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2517 - mape: 7.8021
Epoch 791: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 792/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2515 - mse: 0.2401
- rmse: 0.4900 - mae: 0.2515 - mape: 7.7936
Epoch 792: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 793/2000
296/318 [=====>...] - ETA: 0s - loss: 0.2507 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2507 - mape: 7.7696
Epoch 793: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 794/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2489 - mse: 0.2354
- rmse: 0.4852 - mae: 0.2489 - mape: 7.6993
Epoch 794: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 795/2000
279/318 [=====>...] - ETA: 0s - loss: 0.2522 - mse: 0.2416
- rmse: 0.4915 - mae: 0.2522 - mape: 7.8026
Epoch 795: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 796/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2511 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2511 - mape: 7.7763
Epoch 796: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08

Epoch 797/2000
289/318 [=====>...] - ETA: 0s - loss: 0.2495 - mse: 0.2371
- rmse: 0.4869 - mae: 0.2495 - mape: 7.7447
Epoch 797: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 798/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2525 - mse: 0.2409
- rmse: 0.4908 - mae: 0.2525 - mape: 7.8073
Epoch 798: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 799/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2513 - mse: 0.2407
- rmse: 0.4906 - mae: 0.2513 - mape: 7.7969
Epoch 799: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 800/2000
291/318 [=====>...] - ETA: 0s - loss: 0.2523 - mse: 0.2425
- rmse: 0.4925 - mae: 0.2523 - mape: 7.7959
Epoch 800: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 801/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2496 - mse: 0.2364
- rmse: 0.4862 - mae: 0.2496 - mape: 7.7638
Epoch 801: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 802/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2505 - mse: 0.2392
- rmse: 0.4891 - mae: 0.2505 - mape: 7.7693
Epoch 802: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 803/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2510 - mse: 0.2392
- rmse: 0.4891 - mae: 0.2510 - mape: 7.7729
Epoch 803: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:

0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 804/2000
314/318 [=====>.] - ETA: 0s - loss: 0.2513 - mse: 0.2403
- rmse: 0.4902 - mae: 0.2513 - mape: 7.7907
Epoch 804: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 805/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2503 - mse: 0.2374
- rmse: 0.4873 - mae: 0.2503 - mape: 7.7648
Epoch 805: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 806/2000
307/318 [=====>..] - ETA: 0s - loss: 0.2510 - mse: 0.2399
- rmse: 0.4898 - mae: 0.2510 - mape: 7.7794
Epoch 806: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 807/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2402
- rmse: 0.4901 - mae: 0.2511 - mape: 7.7822
Epoch 807: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 808/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2408
- rmse: 0.4907 - mae: 0.2517 - mape: 7.7990
Epoch 808: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 809/2000
318/318 [=====] - ETA: 0s - loss: 0.2509 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2509 - mape: 7.7785
Epoch 809: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 810/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2517 - mse: 0.2414
- rmse: 0.4913 - mae: 0.2517 - mape: 7.8055
Epoch 810: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:

0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 811/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2507 - mse: 0.2378
- rmse: 0.4876 - mae: 0.2507 - mape: 7.7713
Epoch 811: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 812/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2505 - mse: 0.2388
- rmse: 0.4887 - mae: 0.2505 - mape: 7.7491
Epoch 812: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 813/2000
292/318 [=====>...] - ETA: 0s - loss: 0.2518 - mse: 0.2416
- rmse: 0.4915 - mae: 0.2518 - mape: 7.8072
Epoch 813: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 814/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2506 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2506 - mape: 7.7689
Epoch 814: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 815/2000
286/318 [=====>...] - ETA: 0s - loss: 0.2500 - mse: 0.2388
- rmse: 0.4887 - mae: 0.2500 - mape: 7.7401
Epoch 815: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 816/2000
263/318 [=====>...] - ETA: 0s - loss: 0.2506 - mse: 0.2382
- rmse: 0.4880 - mae: 0.2506 - mape: 7.7554
Epoch 816: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 817/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2514 - mse: 0.2401
- rmse: 0.4900 - mae: 0.2514 - mape: 7.7860
Epoch 817: val_loss did not improve from 0.25095

318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 818/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2508 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2508 - mape: 7.7741
Epoch 818: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 819/2000
282/318 [=====>...] - ETA: 0s - loss: 0.2494 - mse: 0.2351
- rmse: 0.4849 - mae: 0.2494 - mape: 7.7127
Epoch 819: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 820/2000
262/318 [=====>...] - ETA: 0s - loss: 0.2515 - mse: 0.2396
- rmse: 0.4895 - mae: 0.2515 - mape: 7.7622
Epoch 820: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 821/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2509 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2509 - mape: 7.7739
Epoch 821: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 822/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2399
- rmse: 0.4898 - mae: 0.2511 - mape: 7.7850
Epoch 822: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 823/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2508 - mse: 0.2394
- rmse: 0.4893 - mae: 0.2508 - mape: 7.7721
Epoch 823: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 824/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2507 - mse: 0.2392
- rmse: 0.4891 - mae: 0.2507 - mape: 7.7743

Epoch 824: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 825/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2507 - mse: 0.2387
- rmse: 0.4886 - mae: 0.2507 - mape: 7.7739
Epoch 825: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 826/2000
300/318 [=====>..] - ETA: 0s - loss: 0.2502 - mse: 0.2383
- rmse: 0.4881 - mae: 0.2502 - mape: 7.7647
Epoch 826: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 827/2000
312/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2511 - mape: 7.7736
Epoch 827: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 828/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2515 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2515 - mape: 7.7940
Epoch 828: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 829/2000
267/318 [=====>...] - ETA: 0s - loss: 0.2485 - mse: 0.2378
- rmse: 0.4877 - mae: 0.2485 - mape: 7.6827
Epoch 829: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-08
Epoch 830/2000
277/318 [=====>...] - ETA: 0s - loss: 0.2516 - mse: 0.2421
- rmse: 0.4920 - mae: 0.2516 - mape: 7.8056
Epoch 830: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 831/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2484 - mse: 0.2354

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- rmse: 0.4851 - mae: 0.2484 - mape: 7.7020
Epoch 831: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 832/2000
290/318 [=====>...] - ETA: 0s - loss: 0.2505 - mse: 0.2373
- rmse: 0.4871 - mae: 0.2505 - mape: 7.7724
Epoch 832: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 833/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2515 - mse: 0.2404
- rmse: 0.4903 - mae: 0.2515 - mape: 7.7945
Epoch 833: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 834/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2542 - mse: 0.2443
- rmse: 0.4943 - mae: 0.2542 - mape: 7.8606
Epoch 834: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 835/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2498 - mse: 0.2383
- rmse: 0.4882 - mae: 0.2498 - mape: 7.7717
Epoch 835: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 836/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2515 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2515 - mape: 7.7901
Epoch 836: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 837/2000
305/318 [=====>..] - ETA: 0s - loss: 0.2512 - mse: 0.2404
- rmse: 0.4903 - mae: 0.2512 - mape: 7.7953
Epoch 837: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 838/2000

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314/318 [=====>.] - ETA: 0s - loss: 0.2510 - mse: 0.2397
- rmse: 0.4896 - mae: 0.2510 - mape: 7.7841
Epoch 838: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 839/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2514 - mse: 0.2396
- rmse: 0.4895 - mae: 0.2514 - mape: 7.7974
Epoch 839: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 840/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2519 - mse: 0.2403
- rmse: 0.4903 - mae: 0.2519 - mape: 7.8207
Epoch 840: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 841/2000
283/318 [=====>...] - ETA: 0s - loss: 0.2506 - mse: 0.2379
- rmse: 0.4877 - mae: 0.2506 - mape: 7.7647
Epoch 841: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 842/2000
313/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2398
- rmse: 0.4897 - mae: 0.2511 - mape: 7.7817
Epoch 842: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 843/2000
310/318 [=====>.] - ETA: 0s - loss: 0.2503 - mse: 0.2387
- rmse: 0.4885 - mae: 0.2503 - mape: 7.7617
Epoch 843: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 844/2000
316/318 [=====>.] - ETA: 0s - loss: 0.2511 - mse: 0.2400
- rmse: 0.4899 - mae: 0.2511 - mape: 7.7839
Epoch 844: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09

Epoch 845/2000
303/318 [=====>..] - ETA: 0s - loss: 0.2500 - mse: 0.2384
- rmse: 0.4882 - mae: 0.2500 - mape: 7.7516
Epoch 845: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 846/2000
304/318 [=====>..] - ETA: 0s - loss: 0.2501 - mse: 0.2385
- rmse: 0.4884 - mae: 0.2501 - mape: 7.7577
Epoch 846: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 847/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2508 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2508 - mape: 7.7849
Epoch 847: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 848/2000
306/318 [=====>..] - ETA: 0s - loss: 0.2507 - mse: 0.2393
- rmse: 0.4892 - mae: 0.2507 - mape: 7.7692
Epoch 848: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 849/2000
288/318 [=====>...] - ETA: 0s - loss: 0.2511 - mse: 0.2399
- rmse: 0.4898 - mae: 0.2511 - mape: 7.7984
Epoch 849: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 850/2000
294/318 [=====>...] - ETA: 0s - loss: 0.2498 - mse: 0.2365
- rmse: 0.4863 - mae: 0.2498 - mape: 7.7426
Epoch 850: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 851/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2515 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2515 - mape: 7.7901
Epoch 851: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:

0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 852/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2509 - mse: 0.2392
- rmse: 0.4891 - mae: 0.2509 - mape: 7.7765
Epoch 852: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 853/2000
278/318 [=====>...] - ETA: 0s - loss: 0.2519 - mse: 0.2406
- rmse: 0.4905 - mae: 0.2519 - mape: 7.8084
Epoch 853: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 854/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2508 - mse: 0.2379
- rmse: 0.4878 - mae: 0.2508 - mape: 7.7781
Epoch 854: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 855/2000
315/318 [=====>.] - ETA: 0s - loss: 0.2508 - mse: 0.2394
- rmse: 0.4893 - mae: 0.2508 - mape: 7.7754
Epoch 855: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 856/2000
297/318 [=====>..] - ETA: 0s - loss: 0.2503 - mse: 0.2385
- rmse: 0.4883 - mae: 0.2503 - mape: 7.7773
Epoch 856: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 857/2000
318/318 [=====] - ETA: 0s - loss: 0.2509 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2509 - mape: 7.7785
Epoch 857: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 858/2000
318/318 [=====] - ETA: 0s - loss: 0.2509 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2509 - mape: 7.7785
Epoch 858: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:

0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 859/2000
269/318 [=====>...] - ETA: 0s - loss: 0.2496 - mse: 0.2378
- rmse: 0.4877 - mae: 0.2496 - mape: 7.7283
Epoch 859: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 860/2000
262/318 [=====>...] - ETA: 0s - loss: 0.2509 - mse: 0.2404
- rmse: 0.4903 - mae: 0.2509 - mape: 7.7794
Epoch 860: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 861/2000
311/318 [=====>.] - ETA: 0s - loss: 0.2505 - mse: 0.2391
- rmse: 0.4890 - mae: 0.2505 - mape: 7.7704
Epoch 861: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 862/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2508 - mse: 0.2390
- rmse: 0.4889 - mae: 0.2508 - mape: 7.7735
Epoch 862: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 863/2000
276/318 [=====>...] - ETA: 0s - loss: 0.2539 - mse: 0.2457
- rmse: 0.4957 - mae: 0.2539 - mape: 7.8619
Epoch 863: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 864/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2509 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2509 - mape: 7.7785
Epoch 864: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
Epoch 865/2000
280/318 [=====>...] - ETA: 0s - loss: 0.2490 - mse: 0.2353
- rmse: 0.4850 - mae: 0.2490 - mape: 7.7220
Epoch 865: val_loss did not improve from 0.25095

318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
 Epoch 866/2000
 274/318 [=====>...] - ETA: 0s - loss: 0.2501 - mse: 0.2366
 - rmse: 0.4864 - mae: 0.2501 - mape: 7.7464
 Epoch 866: val_loss did not improve from 0.25095
 318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
 Epoch 867/2000
 281/318 [=====>...] - ETA: 0s - loss: 0.2493 - mse: 0.2355
 - rmse: 0.4853 - mae: 0.2493 - mape: 7.7309
 Epoch 867: val_loss did not improve from 0.25095
 318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
 Epoch 868/2000
 296/318 [=====>...] - ETA: 0s - loss: 0.2522 - mse: 0.2420
 - rmse: 0.4919 - mae: 0.2522 - mape: 7.8260
 Epoch 868: val_loss did not improve from 0.25095
 318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
 Epoch 869/2000
 315/318 [=====>.] - ETA: 0s - loss: 0.2512 - mse: 0.2399
 - rmse: 0.4898 - mae: 0.2512 - mape: 7.7863
 Epoch 869: val_loss did not improve from 0.25095
 318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-09
 Epoch 870/2000
 298/318 [=====>..] - ETA: 0s - loss: 0.2513 - mse: 0.2398
 - rmse: 0.4897 - mae: 0.2513 - mape: 7.7842
 Epoch 870: val_loss did not improve from 0.25095
 318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
 Epoch 871/2000
 276/318 [=====>...] - ETA: 0s - loss: 0.2506 - mse: 0.2385
 - rmse: 0.4884 - mae: 0.2506 - mape: 7.7719
 Epoch 871: val_loss did not improve from 0.25095
 318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
 0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
 0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
 Epoch 872/2000
 307/318 [=====>..] - ETA: 0s - loss: 0.2506 - mse: 0.2379
 - rmse: 0.4877 - mae: 0.2506 - mape: 7.7686

Epoch 872: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 873/2000
287/318 [=====>...] - ETA: 0s - loss: 0.2517 - mse: 0.2409
- rmse: 0.4909 - mae: 0.2517 - mape: 7.7975
Epoch 873: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 874/2000
318/318 [=====] - ETA: 0s - loss: 0.2509 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2509 - mape: 7.7785
Epoch 874: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 875/2000
281/318 [=====>...] - ETA: 0s - loss: 0.2500 - mse: 0.2387
- rmse: 0.4885 - mae: 0.2500 - mape: 7.7554
Epoch 875: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 876/2000
284/318 [=====>...] - ETA: 0s - loss: 0.2526 - mse: 0.2422
- rmse: 0.4921 - mae: 0.2526 - mape: 7.8308
Epoch 876: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 877/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2519 - mse: 0.2410
- rmse: 0.4909 - mae: 0.2519 - mape: 7.8213
Epoch 877: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 878/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2521 - mse: 0.2416
- rmse: 0.4915 - mae: 0.2521 - mape: 7.8053
Epoch 878: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 879/2000
285/318 [=====>...] - ETA: 0s - loss: 0.2495 - mse: 0.2364

```

- rmse: 0.4862 - mae: 0.2495 - mape: 7.7379
Epoch 879: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 880/2000
309/318 [=====>.] - ETA: 0s - loss: 0.2508 - mse: 0.2395
- rmse: 0.4893 - mae: 0.2508 - mape: 7.7778
Epoch 880: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 881/2000
317/318 [=====>.] - ETA: 0s - loss: 0.2509 - mse: 0.2395
- rmse: 0.4894 - mae: 0.2509 - mape: 7.7774
Epoch 881: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 882/2000
293/318 [=====>...] - ETA: 0s - loss: 0.2511 - mse: 0.2391
- rmse: 0.4890 - mae: 0.2511 - mape: 7.7838
Epoch 882: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 883/2000
275/318 [=====>...] - ETA: 0s - loss: 0.2495 - mse: 0.2382
- rmse: 0.4880 - mae: 0.2495 - mape: 7.7588
Epoch 883: val_loss did not improve from 0.25095
318/318 [=====] - 0s 1ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 884/2000
274/318 [=====>...] - ETA: 0s - loss: 0.2535 - mse: 0.2423
- rmse: 0.4922 - mae: 0.2535 - mape: 7.8399
Epoch 884: val_loss did not improve from 0.25095
318/318 [=====] - 1s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 885/2000
308/318 [=====>.] - ETA: 0s - loss: 0.2514 - mse: 0.2405
- rmse: 0.4904 - mae: 0.2514 - mape: 7.7867
Epoch 885: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 886/2000

```

```

300/318 [=====>..] - ETA: 0s - loss: 0.2518 - mse: 0.2406
- rmse: 0.4905 - mae: 0.2518 - mape: 7.7899
Epoch 886: val_loss did not improve from 0.25095
318/318 [=====] - 0s 2ms/step - loss: 0.2509 - mse:
0.2395 - rmse: 0.4894 - mae: 0.2509 - mape: 7.7785 - val_loss: 0.2509 - val_mse:
0.2395 - val_rmse: 0.4894 - val_mae: 0.2509 - val_mape: 7.7785 - lr: 1.0000e-10
Epoch 886: early stopping

```

```
[ ]: <keras.callbacks.History at 0x7fdad8120100>
```

1.5 Test model

```
[ ]: print(date_actual)
```

```
20221123-225504
```

```
[ ]: best_model = models.load_model(f'model_weights/
↳{date_actual}_mlp_seg_best_weights.hdf5')
#best_model = models.load_model(f'model_weights/MLPRegressor_Seg_V3_1.hdf5')
```

```
[ ]: best_model.evaluate(X_test, y_test)
```

```

398/398 [=====] - 0s 521us/step - loss: 0.2611 - mse:
0.1861 - rmse: 0.4314 - mae: 0.2611 - mape: 8.8584

```

```
[ ]: [0.26108360290527344,
0.18613235652446747,
0.4314305782318115,
0.26108360290527344,
8.858388900756836]
```

```
[ ]: y_pred = best_model.predict(X_test)
```

```
398/398 [=====] - 0s 533us/step
```

```
[ ]: print("R^2: ", r2_score(y_test, y_pred))
print("mse: ", mean_squared_error(y_test, y_pred))
print("rmse: ", mean_squared_error(y_test, y_pred, squared=False))
print("mae: ", mean_absolute_error(y_test, y_pred))
print("mape: ", mean_absolute_percentage_error(y_test, y_pred))
print("Error estandar: ", stde(y_test.squeeze(),
y_pred.squeeze(), ddof=2))
```

```

R^2: 0.5236201277295904
mse: 0.18613228803747162
rmse: 0.43143051356791123
mae: 0.2610836343129526

```

mape: 0.08858387429836301
Error estandar: 0.4313682287921825

```
[ ]: residuals = y_test - y_pred
residuals_std = residuals/residuals.std()

y_real_stage = np.array([i[0] for i in y_test])
residual_stage = np.array([i[0] for i in residuals])

#y_real_discharge = np.array([i[-1] for i in y_test])
#residual_discharge = np.array([i[-1] for i in residuals])

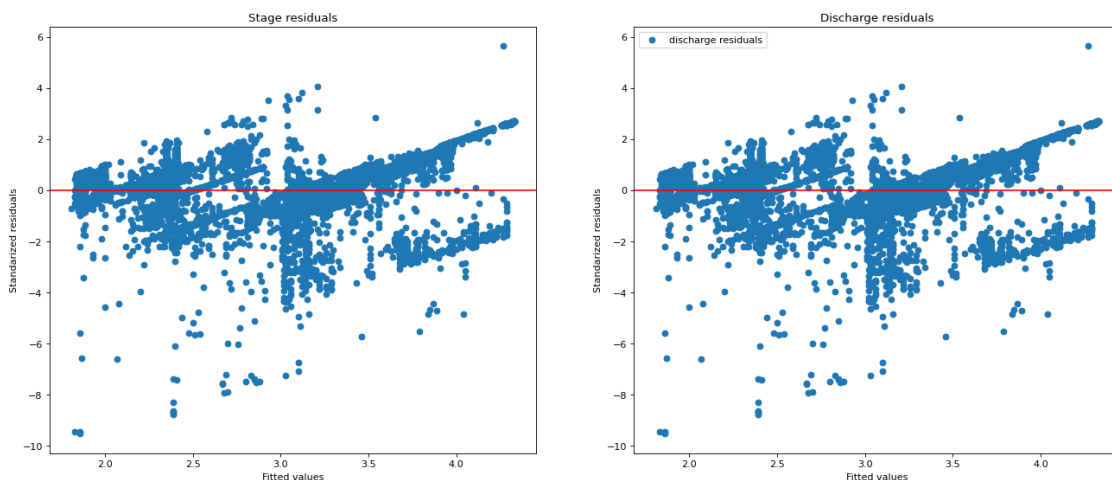
figure, ax = plt.subplots(ncols=2, figsize=(20, 8), dpi=80)

ax[0].scatter(y_real_stage, residual_stage / residual_stage.std(), label="stage_
↳residuals")
#ax[1].scatter(y_real_discharge, residual_discharge / residual_discharge.std(),
↳label="discharge residuals")
ax[0].axhline(y=0.0, color='r', linestyle='-')
ax[1].axhline(y=0.0, color='r', linestyle='-')

ax[0].set_title("Stage residuals")
ax[1].set_title("Discharge residuals")

ax[1].set_xlabel("Fitted values")
ax[0].set_xlabel("Fitted values")
ax[1].set_ylabel("Standarized residuals")
ax[0].set_ylabel("Standarized residuals")

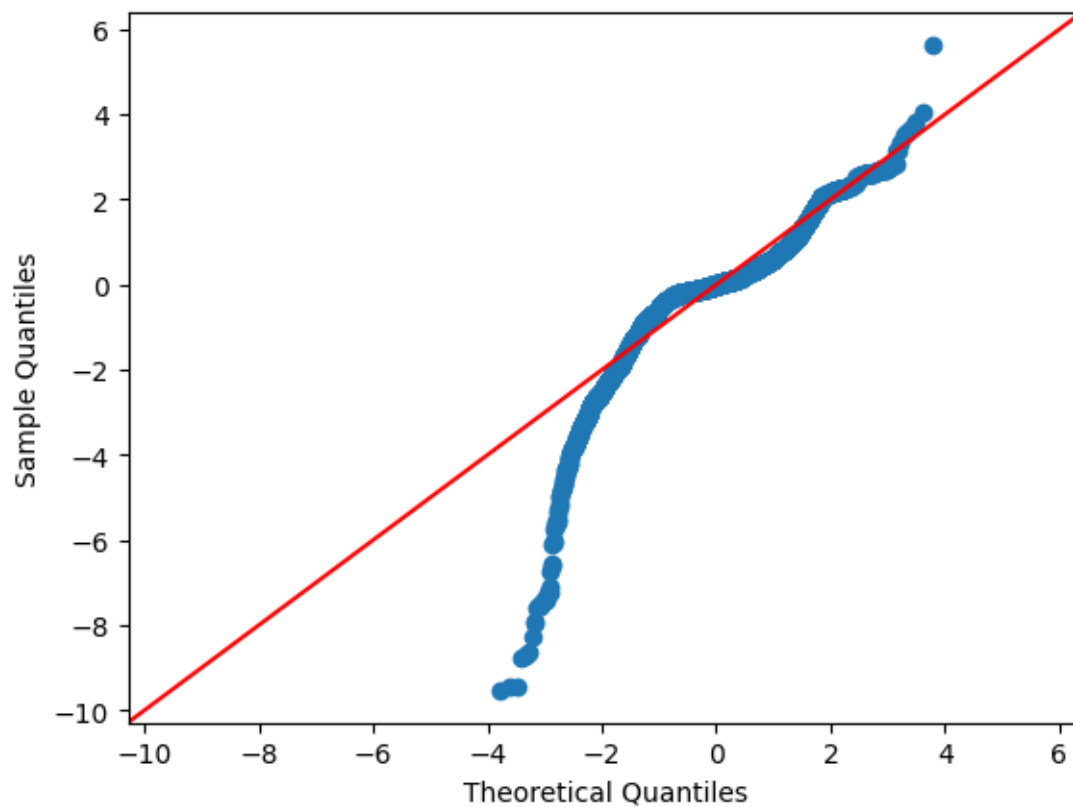
plt.legend()
plt.show()
```



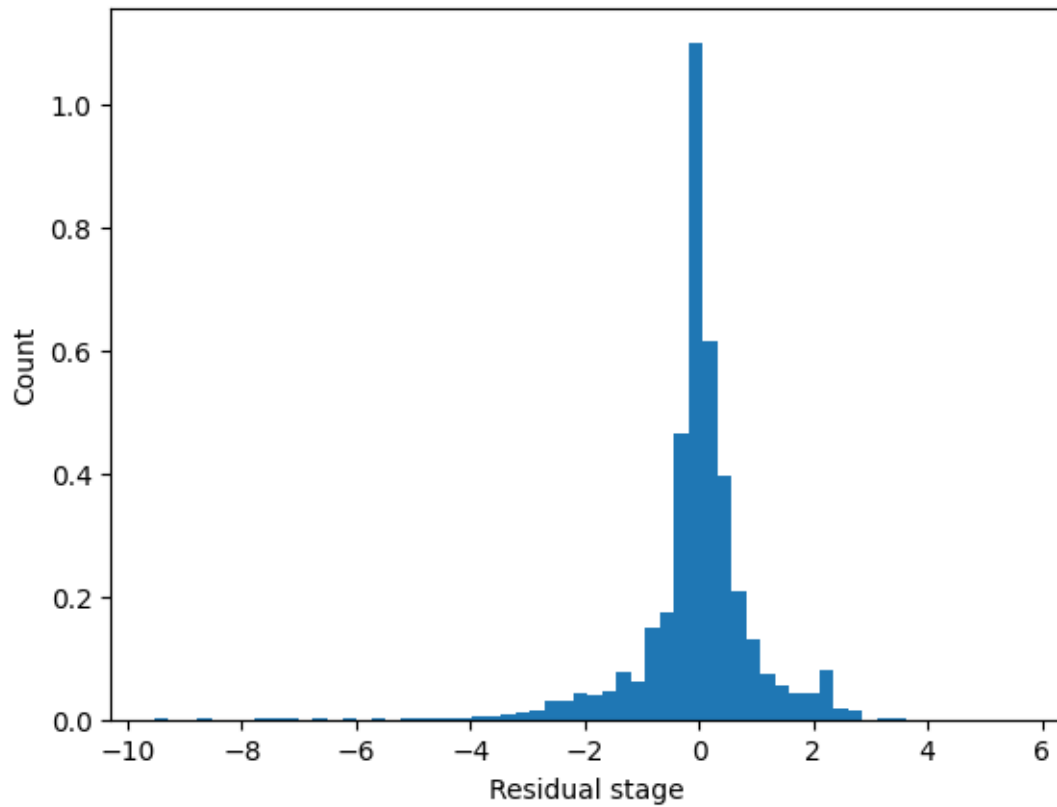
```
[ ]: import statsmodels.api as sm
from statsmodels.stats.diagnostic import normal_ad

#figure = sm.qqplot(residual_stage / residual_stage.std(), line='45',
↪label='stage')
plt.show()
```

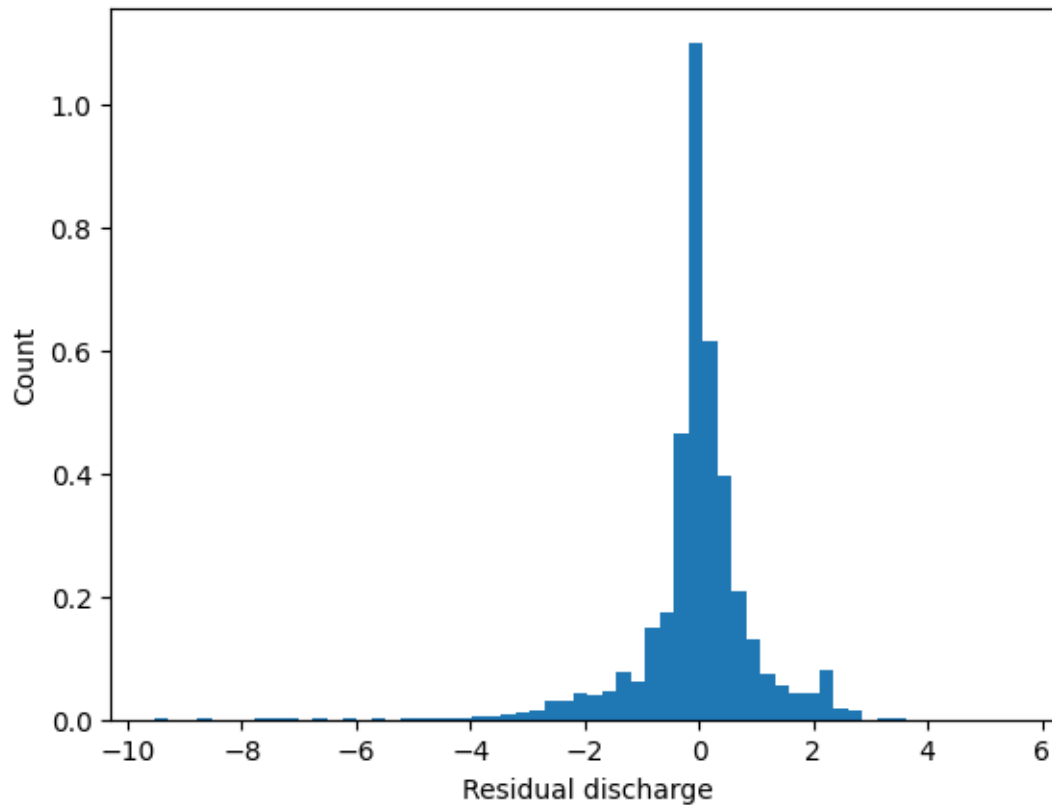
```
[ ]: figure = sm.qqplot(residual_stage / residual_stage.std(), line='45',
↪label='discharge')
plt.show()
```



```
[ ]: plt.hist(residual_stage / residual_stage.std(), density=True, bins = 60)
plt.ylabel('Count')
plt.xlabel('Residual stage');
plt.show()
```



```
[ ]: """plt.hist(residual_discharge / residual_discharge.std(), density=True, bins =  
    ↪ 60)  
plt.ylabel('Count')  
plt.xlabel('Residual discharge');  
plt.show()"""
```

```
[ ]: stat, pval = normal_ad(residual_stage / residual_stage.std())
print("p-value:", pval)

if pval < 0.05:
    print("Hay evidencia de que los residuos no provienen de una distribución_
    ↳normal.")
else:
    print("No hay evidencia para rechazar la hipótesis de que los residuos_
    ↳vienen de una distribución normal.")
```

p-value: 0.0

Hay evidencia de que los residuos no provienen de una distribución normal.

```
[ ]: figure, ax = plt.subplots(ncols=2, figsize=(20, 8), dpi=80)

ax[0].plot(np.arange(len(y_test)), y_test, label="Stage real")
ax[0].plot(np.arange(len(y_test)), y_pred, label="Stage pred")

ax[0].set_title("Stage predictions")
ax[1].set_title("Discharge predictions")
```

```

ax[1].set_ylabel("Values")
ax[0].set_ylabel("Values")
ax[1].set_xlabel("Time")
ax[0].set_xlabel("Time")

plt.legend()
plt.show()

```

No artists with labels found to put in legend. Note that artists whose label start with an underscore are ignored when legend() is called with no argument.

