Time Series Generator

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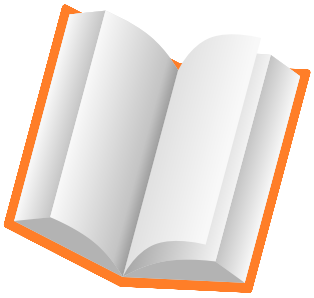
Welcome to Time Series Generator's documentation!

This documents the python package sourced from the following repository.



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CHAPTER

ONE

DESCRIPTION

Emulates Teras Tensorflow TimeSeriesGenerator functionality presenting a candidate solution for the direct multi-step outputs limitation in Keras version.

CHAPTER

TWO

INSTALLATION

```
pip install time-series-generator
```

CHAPTER

THREE

USAGE

3.1 Main Functionality

3.2 Candidate Improvement

Addition of the keyworded argument `length_output`.

```
# define dataset
series = np.array([1, 2, 3, 4, 5, 6, 7, 8, 9, 10])
target = np.array([1, 2, 3, 4, 5, 6, 7, 8, 9, 10])
# define generator
n_input = 2
n_output = 2
generator = TimeseriesGenerator(series, target, length=n_input, length_output=n_output,␣
↪batch_size=1)
# print each sample
for i in range(len(generator)):
   x, y = generator[i]
   print('%s => %s' % (x, y))
```

3.2.1 Output

```
[[1 2]] => [[3 4]]
[[2 3]] => [[4 5]]
[[3 4]] => [[5 6]]
[[4 5]] => [[6 7]]
[[5 6]] => [[7 8]]
[[6 7]] => [[8 9]]
[[7 8]] => [[9 10]]
```

CHAPTER

FOUR

DOCUMENTATION FOR THE CODE

4.1 Modules

4.1.1 Time Series Generator module

class `time_series_generator.time_series_generator.`**`TimeseriesGenerator`**(*data*, *targets*, *length*, *sampling_rate=1*, *length_output=1*, *sampling_rate_output=1*, *stride=1*, *start_index=0*, *end_index=None*, *shuffle=False*, *reverse=False*, *batch_size=9223372036854775807*, *augmentation=0*, *overlap=0*)

Bases: `object`

Utility class for generating batches of temporal data.

This class takes in a sequence of data-points gathered at equal intervals, along with time series parameters such as stride, length of history, etc., to produce batches for training/validation.

 # Arguments

data: Indexable generator (such as list or Numpy array) containing consecutive data points (timesteps). The data should be at 2D, and axis 0 is expected to be the time dimension.

targets: Targets corresponding to timesteps in *data*. It should have same length as *data*.

length: Length of the output sequences (in number of timesteps). sampling_rate: Period between successive individual timesteps

within sequences. For rate *r*, timesteps *data[i]*, *data[i-r]*, … *data[i - length]* are used for create a sample sequence.

stride: Period between successive output sequences. For stride *s*, consecutive output samples would be centered around *data[i]*, *data[i+s]*, *data[i+2*s]*, etc.

start_index: Data points earlier than *start_index* will not be used in the output sequences. This is useful to reserve part of the data for test or validation.

end_index: Data points later than *end_index* will not be used in the output sequences. This is useful to reserve part of the data for test or validation.

shuffle: Whether to shuffle output samples, or instead draw them in chronological order.

reverse: Boolean: if *true*, timesteps in each output sample will be in reverse chronological order.

batch_size: Number of timeseries samples in each batch (except maybe the last one).

 # Returns A [Sequence](/utils/#sequence) instance.

Examples

```python from keras.preprocessing.sequence import TimeseriesGenerator import numpy as np

data = np.array([[i] for i in range(50)]) targets = np.array([[i] for i in range(50)])

**data_gen = TimeseriesGenerator(data, targets,** length=10, sampling_rate=2, batch_size=2)

assert len(data_gen) == 20

batch_0 = data_gen[0] x, y = batch_0 assert np.array_equal(x,

**np.array([[[0], [2], [4], [6], [8]],** [[1], [3], [5], [7], [9]]]))

**assert np.array_equal(y,** np.array([[10], [11]]))

```

get_config()

Returns the TimeseriesGenerator configuration as Python dictionary.

 # Returns A Python dictionary with the TimeseriesGenerator configuration.

to_json(***kwargs*)

Returns a JSON string containing the timeseries generator configuration. To load a generator from a JSON string, use *keras.preprocessing.sequence.timeseries_generator_from_json(json_string)*.

 # Arguments

****kwargs: Additional keyword arguments** to be passed to *json.dumps()*.

 # Returns A JSON string containing the tokenizer configuration.

time_series_generator.time_series_generator.**timeseries_generator_from_json**(*json_string*)

Parses a JSON timeseries generator configuration file and returns a timeseries generator instance.

 # Arguments

json_string: JSON string encoding a timeseries generator configuration.

 # Returns A Keras TimeseriesGenerator instance

4.2 Indices and tables

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