UNIVERSITY OF SRI JAYEWARDENEPURA

B.Sc. (Special) Degree in Computer Science - Part I

CSC 375 2.0 Machine Learning II

Assignment - 2018

Note: This assignment accounts 30% of the module assessment.

EEG Eye State Dataset:

This dataset contains instances of EEG measurements where the output is whether eye was open or not.

All data is from one continuous EEG (Electroencephalogram) measurement with the Emotiv EEG Neuroheadset. The duration of the measurement was 117 seconds. The eye state was detected via a camera during the EEG measurement and added later manually to the file after analyzing the video frames.

0 indicates the eye-open state; 1 indicates the eye-closed state; All values are in chronological order with the first measured value at the top of the data.

The features correspond to 14 EEG measurements from the headset, labeled AF3, F7, F3, FC5, T7, P7, O1, O2, P8, T8, FC6, F4, F8, AF4.

There are 14,980 records in the dataset.

Design the following machine learning models to the given dataset suitably.

1. An LSTM model to predict the next eye state given the previous 10 eye states and previous 10 EEG measurements of the 14 nodes.
2. An LSTM model to predict the next 10 eye states given the previous 10 eyes states and previous 10 EEG measurements of the 14 nodes.

Use first 80% of the dataset to train LSTM models and use the rest to test the models.

Pre-process the dataset before it's being used in the models.

All coding, results, plots and documentation should be in a single 'IPython' or 'Jupyter' notebook. Create a 'GitHub' account for you if you don't have a one yet and store this file in your 'GitHub' repository. Submit the 'link' of this file on or before the given submission date.

Marking Scheme:

1. Pre-processing the data - 10%
2. Data preparation for LSTM model 1 - 10%
3. Data preparation for LSTM model 2 - 10%
4. LSTM model 1 - 15%
5. LSTM model 2 - 15%
6. Predicting values from LSTM model 1 - 10%
7. Predicting values from LSTM model 2 - 10%
8. Analysis of models - 10%
9. Documentation - 10%

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