Data for submission of Chapter 4 (Draft-1) is 21st November Midnight.

22nd November (Wednesday 7:00-8:00) Chapter 3 (Method) Writeup

Chapter 4

Performance Evaluation of BiLSTM, LSTM, and Neural Prophet

Add a paragraph to give an overview of the chapter.

This chapter presents the experimental setup, hardware/software, libraries, and dataset description. It also presents the results and analysis of these results.

**4.1. Experimental Setup (Add a paragraph about the libraries and tools etc, you are using to implement your method. Provide reference to libraries.)**

**NOTE- provide details of hardware and software in form of a paragraph and include any references to the libraries etc.**

**Hardware**

**Processor, RAM (your machine), e.g., Pycharm ………………………………………**

**Colab, check the run-time specification of colab, GPU/TPUs**

**Software:**

**Focus on more libraries. Tensorflow[], pytorch[]**

**4.2. Dataset (Explain dataset in detail, add reference to the dataset.)**

**Describe same way as we did in BDA technical project (Dataset 2023)**

**Features/columns**

**You can include a table as well to summarize the columns from your dataset.**

**Table 4.1. Dataset description.**

|  |  |
| --- | --- |
| **Column Name** | **Description** |
|  |  |
|  |  |
|  |  |

**Table 4.1. presents the details of the dataset. Coulmnam? And Descritption**

**Predicting something/supervised machine learning, then you need to explain the ‘Label/class’**

**4.3. Baseline (s) Note- this section may not be applicable to all.**

**(Discuss briefly about the baseline, i.e., a method with which you will compare your results. It should be very close to your work. E.g., if you are proposing use of BiLSTM, the closest baseline is LSTM. At least one baseline is required.)**

**Paragraph [reference]**

**4.4. Performance metrics (how you will evaluate the performance of your proposed method, e.g., accuracy, etc. Define any formulas/definitions for the selected metrics under this section).**

**This section compares the performance of BiLSTM with the LSTM using the following performance metrics:**

**Accuracy=………………………………………. (1)**

**In Equation 1, TP means true positive, and TN denotes true negative**

**Equation 1………………………………………….**

**F1 Score=**

**Loss=**

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**4.5. Results and Analysis**

**Experiment 1/scenario 1 (4-graphs)**

**This scenario considers the number of iterations varying from 1 to 1000 in steps of 100 and analyzes its impact on loss, accuracy, F1 score, Recall/Sensitivity, Specificity for CascadedCNN and compares with CNN.**

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**Figure 4.1. Effect of number of epochs on loss.**

**Figure 4.1. shows the impact of the number of epochs on the model loss. As can be observed from the Figure initially the loss of the model is higher as the model is not trained. However, as we trained the model, the loss drops. For 100 epochs, the loss of the model drops to 15 that is lower than the 50 epochs. Few more lines here about the loss versus epochs…………………………………………………………… Figure 4.1. shows that model converges at 400 epochs and its fully trained with a loss value lower than 5.**



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**Figure 4.2. Effect of number of epochs on loss.**

**Figure 4.1 shows the effect of epoch on the loss. It can be observed from the Figure that both the training and validation loss is high initially. However, as I increase the number of epochs, it starts dropping. The result reveal that the loss drops significantly after 100 number of epochs. After 200 epochs, the loss of the CascadedCNN starts converging and around 400 epochs it has converged. You should always try arguing the results? Why proposed method converges faster? You need to show some understanding of the method in terms of strengths and weaknesses.**

**Loss versus Epoch for the baseline**

**The results show that the proposed CascadedCNN converges faster…………………………. In contrast to CNN, thereby showing the improved performance of the proposed method.**

**Experiment 2/Scenario 2 (4)**

**This experiment evaluates the accuracy, F1 score, Recall/Sensitivity, Specificity of CascadedCNN with respect to batch size varying from 50 to 200.**

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**Experiment 3/Scenario 3(4)**

**This experiment evaluates the accuracy, F1 score, Recall/Sensitivity, Specificity of CascadedCNN with respect to batch size varying from 50 to 200.**

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**Figure 4.4. Number of clusters vs. precision/recall**

**Figure 4.4. presents the effect of varying number of clusters on precision. It can be seen from the Figure that the proposed model demonstrates a recall of 100% in contrast to baseline that has recall of 92%, thereby showing the improved performance of the proposed method. This is mainly attributed to the fact that the proposed model has higher number of layers or ensemble or dropout………………………………………….. why baseline has bad performance? For the 5 number of iterations,……………………………………………………………………….. discuss results on point 8. It can be seen from the Figure, as the number of iterations increase, the proposed model start converging in contrast to the baseline. For 8 number of iterations, it can be noticed that the CascadedCNN show 15% better recall than baseline.**

**It can be analyzed from the results of the three experiments that the proposed CascadedCNN outperforms CNN in terms of convergence, accuracy, and recall. This is due to the fact that the CascadedCNN……………………………………… (design insights)…………………………………………………………………………..**

**All above results have satisfied the research questions formulated in chapter 1.**

**Summary**

**Findings of the results.**