ABSTRACT

In this paper, we aim to explore the possibility of the Transformer model in detecting the spam Short Message Service (SMS) messages by proposing a modified Transformer model that is designed for detecting SMS spam messages. The evaluation of our proposed spam Transformer is performed on SMS Spam Collection v.1 dataset and UtkMl's Twitter Spam Detection Competition dataset, with the benchmark of multiple established machine learning classifiers and state-of-the-art SMS spam detection approaches. In comparison to all other candidates, our experiments on SMS spam detection show that the proposed modified spam Transformer has the optimal results on the accuracy, recall, and F1-Score with the values of 98.92%, 0.9451, and 0.9613, respectively. Besides, the proposed model also achieves good performance on the UtkMl's Twitter dataset, which indicates a promising possibility of adapting the model to other similar problems.

**EXISTING SYSTEM**

In [12], Gupta *et al.* compared the performance of 8 different classi\_ers including SVM, NB, DT, LR, RF, AdaBoost, Neural Network, and CNN. The experimental tests on the SMS Spam Collection v.1 [13] dataset that was conducted by the authors shows that the CNN and Neural Network are better compared to other machine learning classifiers, and the CNN and Neural Network achieved an accuracy of 98.25% and 98.00%, respectively.

In [14], Jain *et al.* proposed a method to apply rule-based models on the SMS spam detection problem. The authors extracted 9 rules and implemented Decision Tree (DT), RIPPER [15], and PRISM [16] to identify the spam messages. According to the experimental results from the authors, the RIPPER outperformed the PRISM and the DT, yielding a 99.01% True Negative Rate (TNR) and a 92.82% True

Positive Rate (TPR).

In [1], Roy *et al.* aimed to adapt the CNN and LSTM to the SMS spam messages detection problem. The authors evaluated the performance of CNN and LSTM by comparing them with Naïve Bayes (NB), Random Forest (RF), Gradient Boosting (GB) [17], Logistic Regression (LR), and Stochastic Gradient Descent (SGD) [18]. The experiments that were conducted by the authors showed that the CNN and

LSTM perform signi\_cantly better than the tested traditional machine learning approaches when it comes to SMS spam detection.

In [2], the authors proposed the Semantic Long Short-Term Memory (SLSTM), a variant of LSTM with an additional semantic layer. The authors employed the Word2vec [19], the WordNet [20], and the ConceptNet [21] as the semantic layer, and combined the semantic layer with the LSTM to train an SMS spam detection model. The experimental evaluation that was conducted by the authors claimed that

the SLSTM achieved an accuracy of 99% on the SMS Spam Collection v.1 dataset.

In [22], Ghourabi *et al.* proposed the CNN-LSTM model that consists of a CNN layer and an LSTM layer in order to identify SMS spam messages in English and Arabic. The authors evaluated the CNN-LSTM by comparing it with the CNN, LSTM, and 9 traditional machine learning solutions. The experimental tests that were conducted by the authors showed that the CNN-LSTM solution performed better than other approaches and yield an accuracy of 98.3% and an F1-Score of 0.914.

Disadvantages

1) .The system doesn’t have Transformer-based models GPT-3 and BERT to measure an exact spam details.

2). There is no technique called SEQUENCE-TO-SEQUENCE MODELS aiming to find a mapping between two sequences for translation tasks.

**PROPOSED SYSTEM**

The Transformer [3] is an attention-based sequence-to sequence model that was originally designated for translation task, and it achieved great success in English-German and English-French translation. Moreover, there are multiple improved Transformer-based models such as GPT-3 [4] and BERT [5] proposed recently to address different Natural Language Process (NLP) problems. The accomplishments of the Transformer and its successors have proved how powerful and promising they are. In this paper, we aim to explore whether it is possible to adapt the Transformer model to the SMS spam detection problem. Therefore, we propose a modified model based on the vanilla Transformer to identify SMS spam messages. Additionally, we analyze and compare the performance of SMS spam detection between traditional m achine learning classifiers, an LSTM deep learning solution,and our proposed spam Transformer model.

**Advantages**

* The system is more effective due to Long Short-Term Memory (LSTM).
* The gives accurate results due to presence of HYPER-PARAMETERS TUNING.

**SYSTEM REQUIREMENTS**

➢ **H/W System Configuration:-**

➢ Processor - Pentium –IV

➢ RAM - 4 GB (min)

➢ Hard Disk - 20 GB

➢ Key Board - Standard Windows Keyboard

➢ Mouse - Two or Three Button Mouse

➢ Monitor - SVGA

**SOFTWARE REQUIREMENTS:**

* **Operating system :** Windows 7 Ultimate.
* **Coding Language :** Python.
* **Front-End :** Python.
* **Back-End :** Django-ORM
* **Designing :** Html, css, javascript.
* **Data Base :** MySQL (WAMP Server).