IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

PERFORMANCE IMPROVEMENT IN E-HEALTH CARE SYSTEM USING IOT

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Abstract:

The internet might have an impact on computers that aren't directly connected to it. With the aid of the Internet of Things, patients who live distant from a healthcare centre are being helped. Researching the present IoT system's problems is essential in order to develop an effective, practical, and scalable solution for improving healthcare. There must be a strong basis for health-care apps to succeed. It has been anticipated that mankind would face increased health care issues in the future with the introduction of COVID 19. Healthcare solutions that are more trustworthy and precise will be needed, along with the capacity to treat health concerns remotely in a highly effective manner. Existing IoT-based studies are being analyzed for their effectiveness and accuracy by researchers doing in-depth analyses. The integration of LSTM-based intelligent approach to IoT system is being proposed as a method to increase the accuracy of the medical prescription and prescribing system. Research is focusing on improving accuracy and performance

Keyword: IOT, Health Care, LSTM, Accuracy, Performance.

INTRODUCTION

IoT data and information are processed differently from conventional data and information. The Internet of Things' information component is small and readily disseminated. If a connection between the Internet of Things and regular PC processing is identified. The Internet of Things is made up of a huge number of devices, known as hubs. These will be included into the program. The Internet of Things is a term that has been bandied around a lot recently. Linked objects have been existed for a long time, probably as long as the Internet or correspondences themselves. Modern cell phones and personal computers (PCs) are perhaps the best-known and most consistent instances of connected devices. They must remain separate goods, despite the fact that there is just one essential difference, due to the fact that they must be controlled by the client. It is possible for IoT to collect data from a broad range of sources and in a wide variety of locales in the context of patient health care. For example, an EHR may be used to collect data from a variety of devices, including activity trackers and biosensors that detect vital signs. In order to improve patient care, it may be possible to combine and analyze the data provided by these devices. It will be some time before the IoT can be widely used in electronic health records (EHR). A few examples have proved that using the Internet of Things may be beneficial. The LSTM is capable of feedback interconnection. No, this isn't your average neural network. In this case, it's not only about looking at certain data points like graphs. You may also finish audio and video files using this program. According to some, classifiers like LSTM networks. It processes and generates projections based on time series data. Time series data may have unforeseen delays between important occurrences. LSTM networks classify recurrent neural networks. According to a study, it has been observed that a sequence prediction issue may teach order dependence. Complex issues like machine translation need a certain level of caution. Long-term short-term memory has long been regarded as a challenging area of study. The idea of long-term memory is difficult to understand. There has been very little study on long short-term memory.

PROBLEM STATEMENT

Research on IoT in health care discovered that the approach applied impeded IoT performance, which suggests that additional research is required. The Internet of Things has previously been investigated in the healthcare industry. A lack of trust, a narrow scope, and technical problems were some of the shortcomings of prior research. A high-performance IoT system is needed for the prediction and diagnosis of health risks. As a result, additional investigation is essential. It is found that there is need to conduct additional work on accuracy and performance.

RESEARCH METHDOLOGY

It has been suggested that an LSTM model be trained to trace from an unauthentic user. Sender and recipient information, as well as their success or failure, are included in the training data. If the system is routinely attacked by an outside party, these transactions may be more likely to fail than typical. System resources are unavailable to the user if a transaction has been reported as suspicious. By providing transaction authentication on the user's side, this well-trained model boosts security.

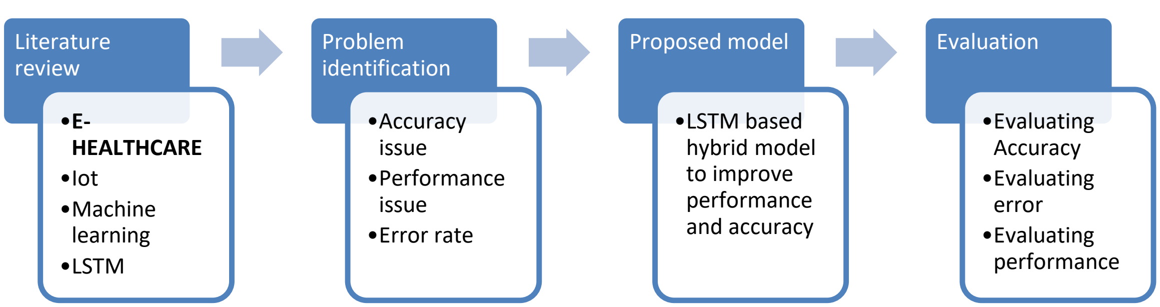

Fig 1 Proposed research Methodology

To begin with, a transaction dataset is examined for training. Error levels are calculated using traditional methods by training and testing datasets. After acquiring the error data, the accuracy of a nave classifier may be determined by considering the ed and id situations (nd). (ed) We'll also take a look at our performance using (ed) (nd). Accuracy (ed) is used to filter the dataset unless it is greater than Accuracy (nd) (nd). We utilise an LSTM model to train on a filtered dataset in order to improve the model's accuracy. Using a dataset of transaction records, the testing module generates predictions for three distinct classes once the model is trained. Results from three classes are sorted by KNN, and a confusion matrix is shown for the viewer's perusal. Authentication-required systems are classified as Class 2, whereas exceptionally authentic IP is classified as Class 3. Class 1 is the safest option.

RESULT & DISCUSSION

Training an LSTM network model using a dataset that includes all of the dataset's attributes and records has been explored in great length in this section. This simulation utilised a dataset of 712 records for training purposes throughout the experiment. 712 records were tested in total. As of this writing, 461 items are listed in the "0" category, compared to a total of 251. There were 712 accurate guesses out of 768 entries, while there were 56 erroneous guesses.

Table1 Error and Accuracy in Previous Work

TRUE	712
FALSE	56
TOTAL	768
ACCURACY	92.71%
ERROR	7.29%

In this case, a training dataset of 768 entries was used. And a total of 768 records were tested. At a point where 476 records are 0, and 261 records are 1. 737 of the 768 predictions made in the simulation were correct, while just 31 were incorrect.

Table2 Error and Accuracy in Proposed Work

TRUE	**737**
FALSE	31
TOTAL	768
ACCURACY	95.96%
ERROR	4.04%

Comparative Analysis

A confusion matrix is used to compute accuracy, which is a measure of the accuracy of the findings. A classifier's ability to accurately predict the correct response is measured by its recall. By calculating the measurement's accuracy, one may calculate the measurement's precision. For accuracy, the test's F1 score is used. Accuracy of existing model is compared to conventional work.

Table Comparison of accuracy

Class	Conventional	Proposed LSTM
1	92.71%	95.96%
2	92.71%	95.96%

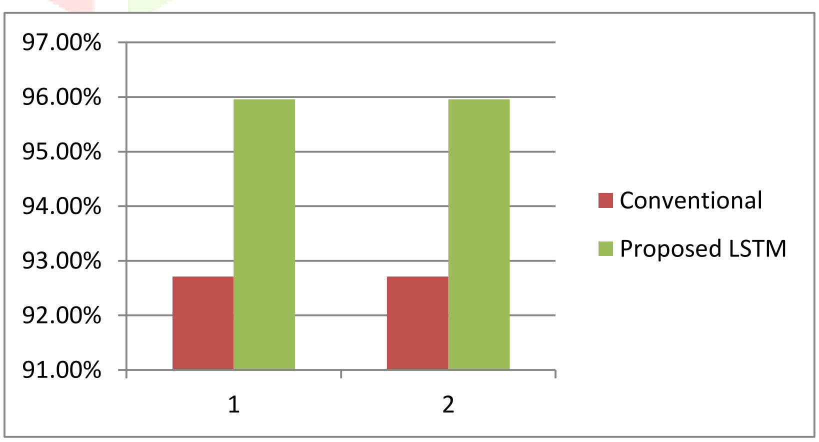

Fig: Comparison of accuracy

Error rate of existing model is compared to conventional work.

Table 3 Comparison of error rate

Class	Conventional	Proposed LSTM
1	7.29%	4.04%
2	7.29%	4.04%

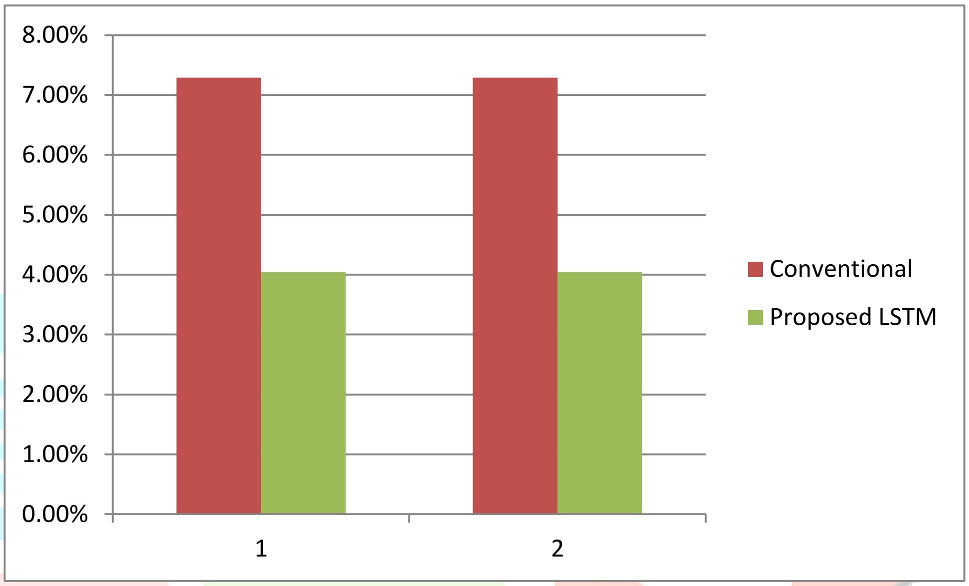

Fig Comparison of precision

Performance of existing model is compared to conventional work.

Table4 Comparison of Performance

Conventional Time consumption (in min)	Proposed LSTM Time consumption (in min)
45	39

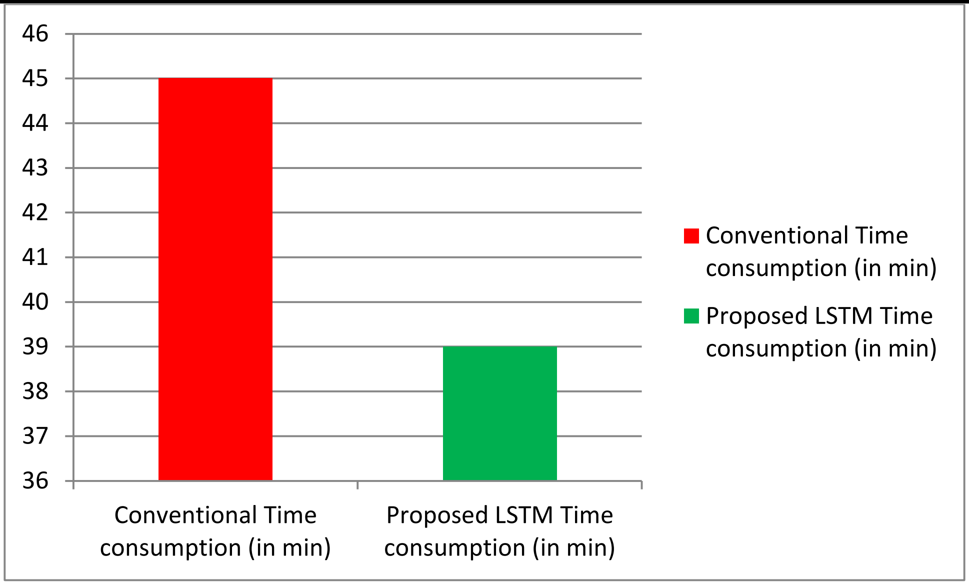

Fig Comparison of time consumption during training

CONCLUSION

In the current IoT system, LSTM model is applied for trustworthy and flexible health care solution. "We've come to the conclusion that the suggested work is more accurate and less error-prone. Moreover proposed work is providing high performance as compared to conventional training models. Studies like this have paved the way for IoT-based healthcare delivery. This method is used in distance education, online education, business, and real-world applications. This study will make it more helpful, more dependable, and easier to use in the future. This approach makes it easier to identify health problems early on.

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