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Fake Media Detection Based on Natural Language Processing and Block chain Approaches

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Abstract: ***Based on advancements and modern technologies in the field of social media network, computer science, are one of the significant components of human life. This environment, which is the primary period for data collection and transmission, has become a well-known platform for exchanging news and information on a daily report and variety of topics. Although this environment has many benefits, there are also many false reports and pieces of information that deceive readers and users into believing they are receiving the correct information. Now-a-days all users are using social media to access news content but sometime some malicious users will alter genuine news and then spread fake news which may degrade social media fame and to avoid such fake news many existing algorithms were introduced but all those algorithms are based on traditional machine learning algorithms such as SVM or RF. This algorithms lack of security and authorization***

Keywords: reinforcement learning, fake media, block chain, Natural language processing

I. INTRODUCTION

The enormous amount of data is produced on social networking in different formats of social media. There have been very large amounts of posts that have increased social media data on the web explosively. Many people discuss it on the web through social networking when some event has occurred. They are searching for or retrieving and discussing news incidents as the daily routine. However, very big volumes of news or posts caused users to face the issue of overloading data during search and retrieving.

Unreliable sources of data expose individuals to a dose of false news, hoaxes, rumors, theories of conspiracy and fake news. Fake news for different political and economic benefits occurs in large numbers following the successful development of online social media platforms. Several analytical experiments were performed using Natural Languages Processing (NLP) analytics to estimate the origins of false information or analyze the news text to characterize news as fake or accurate in different classifications.

Current methods have detected false statements using other computer vision models, namely Naive Bayes, ANN, SVM, etc. While there are several tools and techniques to identify fake news outlets, such as whether a website or person releases fake news, this problem can be discussed as an example of text analysis, utilizing news and information to function based on description, body, and context. Using it helps to identify a false statement by creating deep learning models.

Specific parameter estimates will ensure higher predictive accuracy for the best results by tuning and regularly training the model. Security methods using deep neural networks can recognize fake news and prevent malicious writers from disseminating fake information. In comparison, this paper integrates the advantages of blockchain with machine learning techniques to identify and prevent the spread of false information in widespread communication.

The remaining sections are structured as follows. Section 2 is a review the past work done in the field of blockchain and fake news detection. Section 3 introduces the proposed approach and model. Section 4 discussed about the blockchain algorithm design. Section 5 presents the experiments conducted to evaluate proposed fake news detection model using blockchain framework. Section 6 makes concluding remarks and discusses future work.

An enormous amount of data is produced on social networking in different formats of social media. Many people discuss it on the web through social networking when some event has occurred.

They are searching for or retrieving and discussing news incidents as part of their daily routine. However, very big volumes of news or posts caused users to face the issue of overloading data during search and retrieving. Unreliable sources of data expose individuals to a dose of false news, hoaxes, rumors, theories of conspiracy and fake news. Social media is the source of all kinds of global and local news for most of the people in this generation.

But it backfires when an individual/organization uses it to spread fake news. Because, in social media, clickbait stories take a brief time to spread exponentially. The news becomes viral worldwide just within days. These opportunist organizations or individuals are taking advantage of people's tendency to share appealing news without knowing its authenticity or consequences. Based on the concept of blockchain in social media, our system will exploit the advantages of blockchains security, immutability and transparency to create trust among shared news.

We will provide a hypothesis, which could be implemented in a decentralized social media and provide authenticity of some news among users.In this present context, it is tough to determine if a news is phony. No authority will certify valid news. If this task is given to an organization, there is a chance that the organization will be biased. Besides, the organization will have to carry out the whole responsibility of validation. In some extreme cases, the government might pressurize them.

Whereas in Blockchain, we can offer a system where this validation can be done anonymously. The idea is that we will integrate social media in a Blockchain in such a way that random users (including journalists) will act as news validators. Because of anonymity, they can validate news without any external pressure. Therefore, they cannot be biased nor pressurized by any other person or organization. After publishing news, the news will deploy as a transaction in a chain. After a certain level of virality, the validator users will get a request to verify the news.

II. LITERATURE SURVEY

The purpose of this study is to look at the particular elements of the environment that surrounded the development of Fake news communication technology. Because it enables the heuristic potentials of the theory of communicative action to be merged, interactive approach, system-sociological methodology, and the multi paradigm approach serves as the theoretical framework for the analysis. Secondary materials on the problems with modern political communication as well as theme content on social media platforms like VKontakte, Facebook, and Twitter, etc. were part of the empirical base. The analysis's findings are summarised in the table below. Second, social media is becoming a more important tool for political communication. [1]

First off, the arsenal of contemporary political communication tools has been growing recently, which attests to the growth of a well-known In contrast to traditional mass media like television, radio, magazines, and newspapers, the growth of social networks to disseminate news has had the unintended consequence of an epidemic spread of fake news. Fake news poses a threat to logical the authority, journalism, democracy, and truth, of governmental institutions because it is difficult for humans to distinguish between false and true facts. In this article, we discuss machine learning, dimensionality reduction, vectorization, quality evaluation of information retrieval, and methods for pre-processing data in natural language. We also discuss research initiatives and opportunities while contextualising the detection of fake news. [2]

Online social networks are becoming more and more common, and they are being utilised for a wide range of rich activities. This calls for evaluating the social trust in the social network along a particular social trust path between two anonymous members. People commonly follow several social trust pathways. It is therefore challenging to identify the social trust approach that can yield the most trustworthy evaluation result. We suggest adopting the Monte Carlo-based effective approximation technique MONTE K to address this issue. [3]

The exponential increase of online information and the rising usage of social media are both results of the swift development of network services. Malicious accounts take advantage of these services to disseminate propaganda and false information over large user networks. As a result, the detection of fake news and deception needs to be automated. The events in Hong Kong were discussed in 2,366 tweets written in English that were published in August of 2019. Our method is put to the test in trials with two machine learning models, outperforming earlier studies in terms of performance. [4]

Machine learning is especially pertinent in the context of fraudulent communications in Social Media due to the scope of ecological and sociological challenges. Anyone can create a message that becomes viral and can be authentic or fraudulent. Political parties do this during general elections in nations like India by disseminating false information across the nation via social media groups. While many of the messages are false, some may be genuine. Spam communications and phoney messages providing incorrect information can both propagate through social media groups. Both the decision-makers and the common person face severe issues with this. Researchers use a variety of machine learning approaches to recognise spam messages and fake news. In fact, deep learning techniques are widely used today because they can successfully solve text recognition problems, such as the detection of spam and false news, because these models work well on unprocessed data by independently analysing high-level properties. This paper discusses several deep learning and conventional machine learning strategies for detecting spam and false mails. This article also presents a survey of many studies on false news identification that have been conducted utilising Deep Neural Networks and conventional machine learning techniques. [5]

News is produced quickly and in large quantities on social media platforms like Twitter. Yet, very few of them can be quickly classified (as phoney or real news). Convolutional neural networks are used to create these two routes, which are then jointly optimised to improve detection performance. In order to exchange the low level features between these two routes, we also construct a shared convolutional neural network. The suggested model may effectively identify bogus news with a small amount of labelled data, according to experimental results with Twitter datasets. [6]

Massive amounts of internet material have been rapidly disseminated among an increasing number of social network users during the past 10 years. It is a phenomenon that has repeatedly been utilised by villains who create, disseminate, and reproduce false and misleading information. Also, a thorough experimental setup performs classification tests using the news headlines and information that have been cleverly separated from tweets. Our main findings show that detecting fake news is generally very accurate. By utilising less characteristics and embeddings from the tweet text, the suggested deep learning architecture performs better than the most advanced classifiers. [7]

III. PROPOSED METHOD

In propose paper author is using Reinforcement Deep Learning algorithm to detect fake news and then applying Block chain technology to provide security to NEWS data. Reinforcement algorithm will match similarity between old news and current news and if news contains more similarity then it will detect as Fake news and penalized the user and if news is REAL then algorithm will reward user and then store NEWS in Block chain.

Block chain store each news as block/transaction and associate each block with unique hash code and then store this block in multiple nodes as Decentralized storage and if one node is down then Block chain will access News from other working nodes. Block chain verify all hash code before storing new block and if all blocks verification successful then only new block will store and this mechanism is called as proof of work or proof of authority.

To detect fake news in propose paper applying NLTK (natural language tool kit) technique to remove STOP WORDS, special symbols, data

normalization, converting words into numeric vector (numeric vector will assign average count of each word), STEMMING and lemmatization. Vector will be input to Reinforcement algorithm to train FAKE news model and this trained model will be applied on all TEST news to predict weather news is fake or real. Reinforcement will take each INPUT as state and then apply model to predict ACTION and if action is Fake then algorithm will penalized user and if action is real then user or news publisher will get reward.

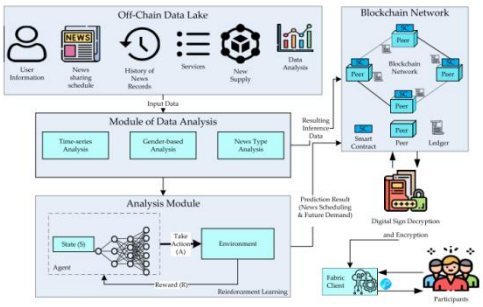


FIGURE 1. Block diagram of the proposed fake news detection approach.

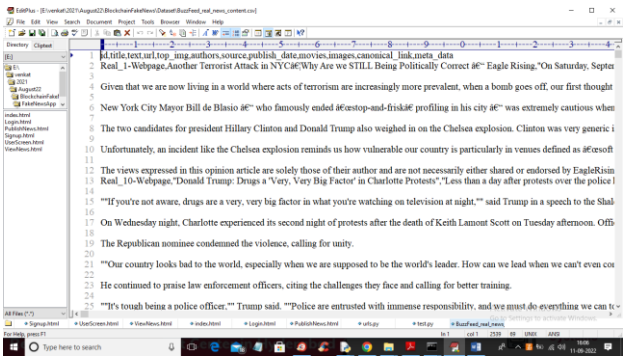
IV. Results Analysis

Now-a-days all users are using social media to access news content but sometime some malicious users will alter genuine news and then spread fake news which may degrade social media fame and to avoid such fake news many existing algorithms were introduced but all those algorithms are based on traditional machine learning algorithms such as SVM or Random Forest. This algorithms lack of security and authorization.

In propose paper author is using Reinforcement Deep Learning algorithm to detect fake news and then applying Blockchain technology to provide security to NEWS data. Reinforcement algorithm will match similarity between old news and current news and if news contains more similarity then it will detect as Fake news and penalized the user and if news is REAL then algorithm will reward user and then store NEWS in Blockchain. Blockchain store each news as block/transaction and associate each block with unique hashcode and then store this block in multiple nodes as Decentralized storage and if one node is down then Blockchain will access News from other working nodes. Blockchain verify all hashcode before storing new block and if all blocks verification successful then only new block will store and this mechanism is called as proof of work or proof of authority.

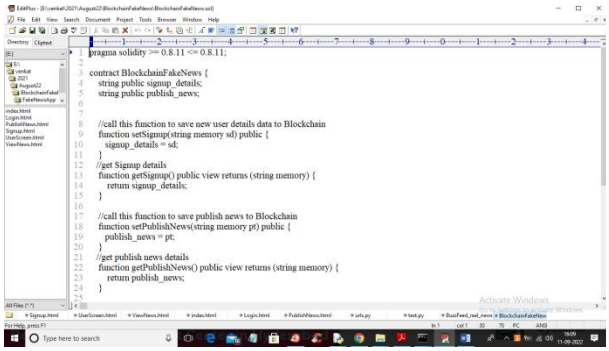
To detect fake news in propose paper applying NLTK (natural language tool kit) technique to remove STOP WORDS, special symbols, data normalization, converting words into numeric vector (numeric vector will assign average count of each word), STEMMING and lemmatization. Vector will be input to Reinforcement algorithm to train FAKE news model and this trained model will be applied on all TEST news to predict weather news is fake or real. Reinforcement will take each INPUT as state and then apply model to predict ACTION and if action is Fake then algorithm will penalized user and if action is real then user or news publisher will get reward.

To implement this project author has used BUZZ NEWS and many more dataset but we are using BUZZ news dataset only and below is the dataset screen shots



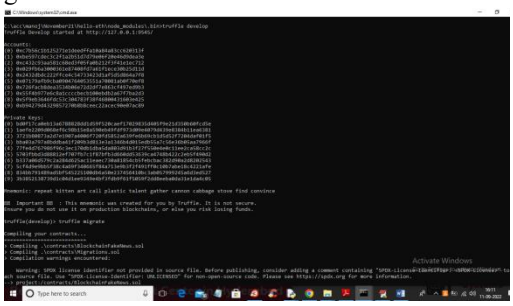
In above screen first row contains dataset column names and remaining rows contains dataset values and by using above dataset we will train Reinforcement algorithm.

To store or access data from Blockchain we need to develop SMART CONTRACT which will contains functions to STORE and READ data and below is the SMART CONTRACT for Fake News application.

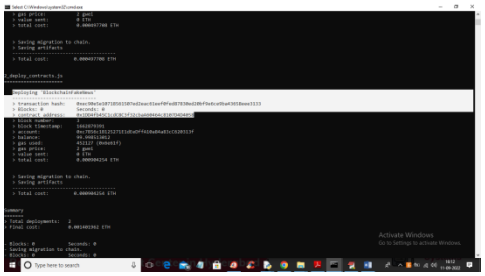


In above screen we have define smart contract functions to store USER & NEWS details and we need to deploy this contract in Blockchain server and for deployment we need to follow below steps

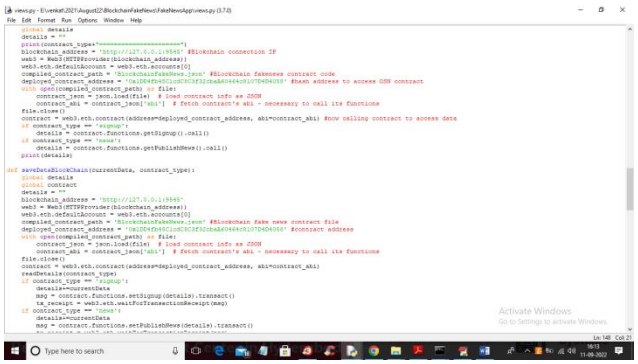
1) First go inside 'hello-eth/node_modules/.bin' folder and then double click on 'runBlockchain.bat' file to get below screen



In above screen Blockchain generated Private keys and default account address and now type command as 'truffle migrate' and then press enter key to deploy contract and get below output

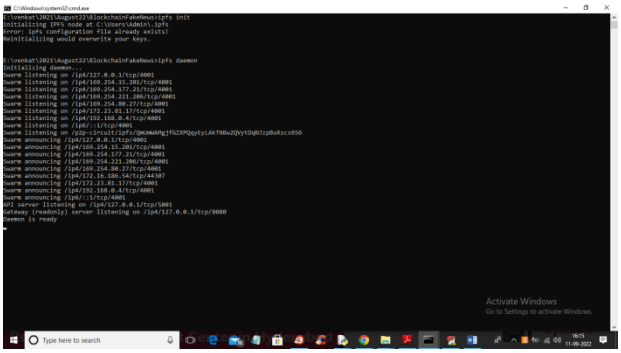


In above screen in white colour text we can see Blockchain Fake News contract deployed and we got contract address also and this address we need to specify this address in python program to access above contract to store and read data from Blockchain.

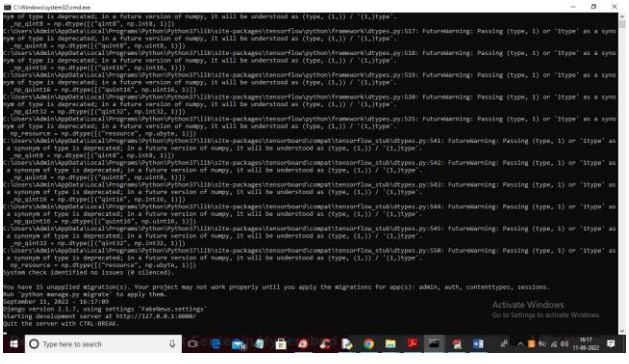


In above screen read red colour comments to know about how to call Blockchain function to store and read data using Python program.

Now after deployment double click on 'Start_IPFS.bat' file to start IPFS server to store image of application and to get below screen

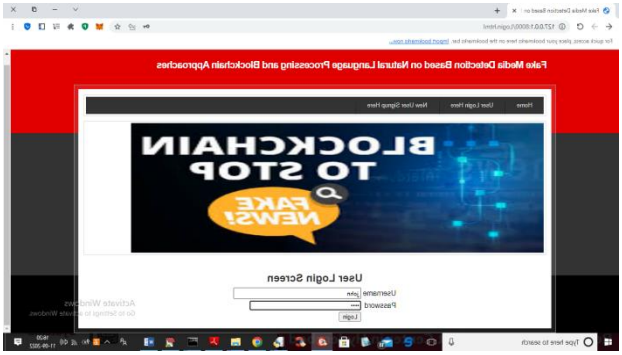


In above screen IPFS server started and now double click on 'runServer.bat' file to start python server and get below output

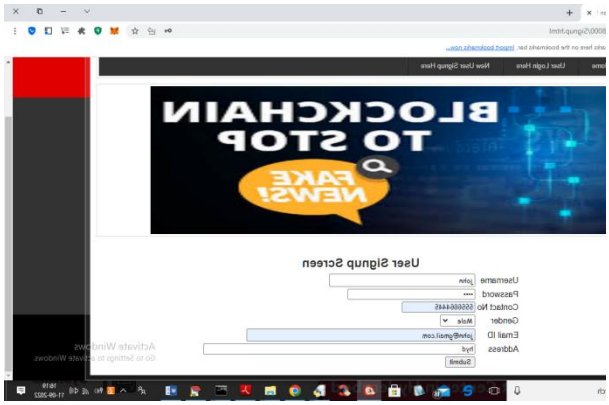


In above screen python server started and now open browser and enter URL as 'http://127.0.0.1:8000/index.html' and press enter key to get below home page.

In above screen click on 'New User Signup Here' link to get below signup screen



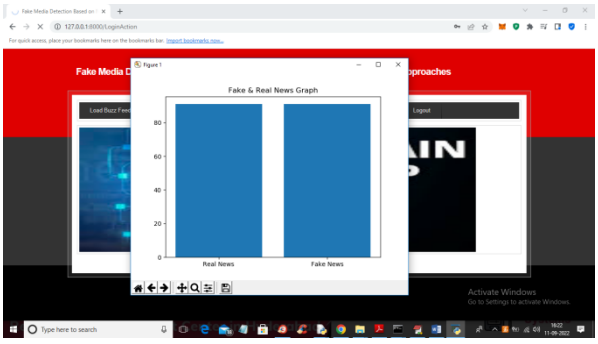
In above screen user is login and after login will get below screen



In above screen user is entering signup details and then click on 'Submit' button to get below output

In above screen user can click on 'Load Buzz Feed Dataset' button to load dataset and get below output

In above screen in red colour text we can see user details saved in Blockchain and now click on 'User Login Here' to get below login screen



In above screen dataset loaded and we can see number of Fake and Real NEWS graph and in above graph x-axis represents NEWS TYPE and y-axis contains count of that news type and now close above graph to get below output

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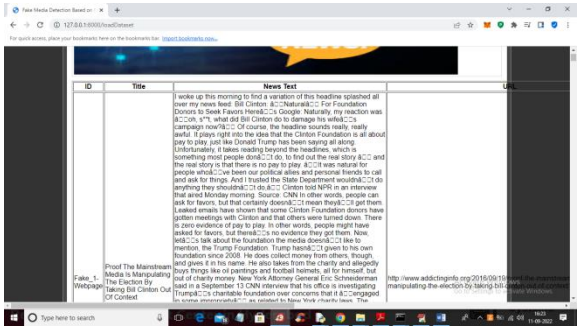
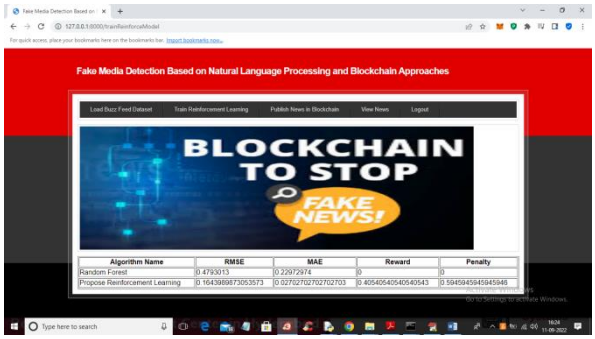
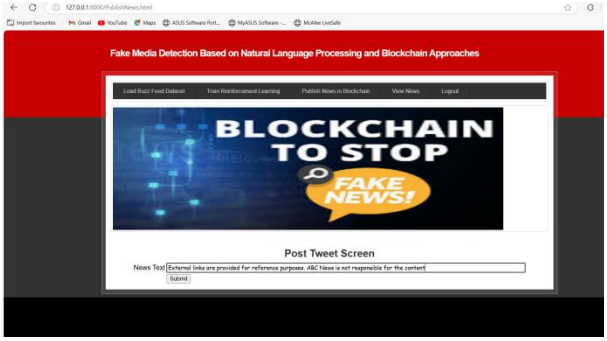


In above screen we can see News loaded from dataset and now click on 'Train Reinforcement Learning' link to train Reinforcement algorithm and get below output



In above screen we have trained dataset with existing Random Forest and propose Reinforcement algorithm and then we got RMSE, MAE, reward and penalty for both algorithms. Existing Random forest do not have support for REWARD and Penalty and we can see Propose reinforcement got less RMSE and MAE compare to existing algorithm. The lower the RMSE and MAE the better is the algorithm. Now algorithm model is trained and ready and now click on 'Publish News in Blockchain' link to publish news and then Reinforcement will classify weather news is Fake or Real.



In above screen I entered some NEWS and then uploading picture and then click 'Submit' button to detect news as Fake or Real and then store in Blockchain and will get below output

In above screen we can see News is stored in Blockchain and we got hashcode of news storage and Transaction storage DELAY and now click on 'View News' link to view LIST of all news published by all users

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In above screen we can see names of USERS who publish news and then we can see detection output as FAKE or REAL. Similarly you can upload and test other news.

Note: if u don't have any TEST news data then you can copy some lines from 'Test_News.csv file'

V. CONCLUSION

One of the more well-known research problems in contemporary technology is the dissemination of fake news, which results from a lack of security and confidence in the truthfulness of the information posted on social media. In this article, we discussed how to create a trust-based architecture for online sharing news using machine learning methods and block chain technology. To create a trustworthy decision-making architecture,

we used the learning-based reinforcement learning technique. We coupled it with the Proof-of-Authority protocol, the block chain architecture, smart contracts, and a special consensus method. Social media is essential in this process. The spread of bogus news on the shared information platform makes it difficult to investigate and develop the Proof-of-Authority protocol and user validation.

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