**FAKE NEWS DETECTION USING NLP AND MACHINE LEARNING**

**ABSTRACT:**

**INTRODUCTION:**

Fake news always gets attraction from researchers and general public as the spread of fake news is faster than the spread of actual news. Major circulation of misinformation is through social medias such as twitter, Facebook, and other news blogs this is because of large social connections among users.

Researches has shown that fake news spread faster through social medias and it has more impact on people. According to the survey after learning about fake news it is said that 58% of people have less trust on social media because of the misinformation spread through social medias.

From a research it is also said that 62% of U.S adults read news from online (Jeffrey and Elisa, 2016). As most of them gets news from online sources it is a need to identify fake news so that you can avoid spreading of fake news preventing it from reaching people.

Fake news influence people in many ways, it has impacts politically and economically. For political impacts we can take an example of how fake news helped Donald Trump during the 2016 elections. A tweet saying ‘Breaking: Two explosions in the White House and Barack Obama is injured’ which was sent from a press tweeter account by Syrian Electronic Army has led to loss of 136 billion dollars on New York Stock Exchange in two minutes.

**BACKGROUND**

**SCOPE AND OBJECTIVES**

**ACHIEVEMENTS**

**OVERVIEW OF DISSERTATION**

**STATE OF ART:**

1. SENTIMENT AWARE FAKE NEWS DETECTION ON ONLINE SOCIAL NETWORKS:

In this paper written by Oluwaseun Ajao, Deepayan Bhowmik and Shahrzad Zargari, main aim of the project is automatic fake news detection with respect to sentiment or emotion analysis. Using the emotions in the text as a key in relation to spread of fake news or rumours they proposed a hypothesis. Experiment is conducted in two folds where initially they determine relation between emotion and fake news and then improving the model to predict fake news considering sentiment or emotions.

They used PHEME labelled twitter dataset where the images were retrieved for implementation. Using models such as Latent Dirichlet Allocation (LDA) and Latent Semantic Analysis (LSA) they extracted the sentiments from the texts. Data is been split into training and testing datasets and implementation is carried out on different models such as Logistic Regression, SVM, Decision Trees, Random Forest, Extreme gradient Boosting and LSTM\_HAN. As a result, it achieved better performance than the previous state of art with SVM and HAN model performing with 86% accuracy. By adding features from words within the text along with emotional ratio, accuracy of the model increased by 3% which means now the accuracy of the model is 89%. In this paper they also say about the further work that can be done which includes images, gifs, embedded text in images and videos which may improve the performance of the model as in this model they considered only text as the data.

1. FAKE NEWS IDENTIFICATION ON TWITTER WITH HYBRID CNN AND RNN MODELS:

This paper, which was published in 2018 written by Oluwaseun Ajaao, Deepayan Bhowmik and Shahrzad Zargari, its main aim is to propose a hybrid model of CNN and LSTM RNN for detecting fake news. They proposed the two-fold approach when in initially they discuss about the automatic identification of features using CNN and LSTM without any prior knowledge of domain later they speak about classification of fake news using text and images. Here they used a dataset which consists of 5800 tweets about five rumours and applied a ten-fold cross validation. They used LSTM as this is efficient in time and sequence-based predictions. They also used LSTM with dropout regularization and LSTM with CNN as CNN is well known for its image classification. And they also used grid search for optimizing the hyper-parameters.

As a result, LSTM achieves 82% accuracy and good precision, recall and FMeasure compared to others. LSTM with dropout regularization performs least probably because of underfitting as the training data is relatively less. LSTM with CNN performed better than dropout regularization, but it performed less than plain LSTM model. In their further work they are trying to improve the robustness of the model by collecting the reactions of other users to the tweets.

1. A SURVEY ON NATURAL LANGUAGE PROCESSING FOR FAKE NEWS DETECTION:

In this paper published in 2020 Ray Oshikawa, Jing Qian and William Yang Wang they do a survey on automated fake news detection from the perspective of Natural Language Processing. They speak about the different challenges and how researchers deal with those problems while detecting fake news. Automatic detection of fake news is necessary as it reduces the human time and efforts to detect fake news and helps in stopping the spread of misinformation. Here they followed a three fold approach where firstly they give a review about NLP in detecting fake news secondly they say how fake news detection is aligned with existing NLP tasks and lastly categorizing and summarizing datasets and its results and stating about the further research work related to this field. They considered different datasets and categorized them mainly into three types of datasets which are CLAIMS, ENTIRE-ARTICLES and POSTS ON SOCIAL NETWORKING SERVICES. Claims dataset are manually labelled short claims about an issue. Data is collected from politifact, channel4.com, snopes etc. under claims dataset, FEVER data is used for fact-checking leading it to check truthfulness and LIAR is also used to check truthfulness. In entire-article dataset they consider entire article for detecting fake news and the dataset used is FAKENEWSNET. In posts on social networking services they consider the posts they made on social networks for their work and they consider dataset from BUZZFEEDNEWS, SOME-LIKE-IT-HOAX, PHEME and CREDBANK. But they mainly focused on 3 datasets which are LIAR, FEVER and FAKENEWSNET. In the pre-processing step for feature extraction they used TF-IDF and LIWC. Models they have implemented are SVM, LR, RFC, RNN, LSTM, CNN and RHETORICAL APPROACH. After training and testing the data along with NLP implementation FAKENEWSNET dataset got accuracy of 94% for GCN model and FEVER dataset got accuracy of 64% with LSTM(ESIM-Att). They also suggest future work by exploring specific hyperparameter optimization or by isolating certain emotions or by including images and videos in their implementation or by extracting sentiments and emotions with different approaches.

**TECHNICAL BACKGROUND:**

**MODELS**

**METHODOLOGY:**

**DATA ANALYSIS AND EXPLORATION**

**DATA PREPARATION**

**MODEL DESIGNS**

**RESULTS:**

**CONCLUSION:**