

FAKE NEWS DETECTION AND SENTIMENT ANALYSIS IN TWITTER

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Abstract: - Sentiment analysis deals with identifying and classifying opinions or sentiments expressed in source text. Social media is generating a vast amount of sentiment rich data in the form of tweets, status updates, blog posts etc. Sentiment analysis of this user generated data is very useful in knowing the opinion of the crowd. Twitter sentiment analysis is difficult compared to general sentiment analysis due to the presence of slang words and misspellings. Knowledge base approach and Machine learning approach are the two strategies used for analysing sentiments from the text. Public and private opinion about a wide variety of subjects are expressed and spread continually via numerous social media. Twitter is one of the social media that is gaining popularity. Twitter offers organizations a fast and effective way to analyse customers' perspectives toward the critical to success in the market place. Developing a program for sentiment analysis is an approach to be used to computationally measure customers' perceptions. This project uses knowledge base including various patterns for tweets along with multiple strategies to detect the sentiment expressed in a tweet and if a tweet is genuine or not. Various machine learning and knowledge base approaches are used to compare patterns and apply strategies and NLP for sentiment analysis.

Keywords: - NLP (Natural Language Processing), Sentiment Analysis, Machine Learning, Pattern Matching, Twitter Data, POS (Part of Speech)

I INTRODUCTION

Twitter has emerged as a major micro-blogging website, having over 100 million users generating over 500 million tweets every day. With such large audience, Twitter has consistently attracted users to convey their opinions and perspective about any issue, brand, company or any other topic of interest. Due to this reason, Twitter is used as an informative source by many organizations, institutions and companies. On Twitter, users are allowed to share their opinions in the form of tweets, using only 140 characters. This leads to people compacting their statements by using slang, abbreviations, emoticons, short forms etc. Along with this, people convey their opinions by using sarcasm and polysemy. Hence it is justified to term the Twitter language as unstructured.

In order to extract sentiment from tweets, sentiment analysis is used. The results from this can be used in many areas like analysing and monitoring changes of sentiment with an event, sentiments regarding a particular brand or release of a particular product, analysing public view of government policies etc. A lot of research has been done on Twitter data in order to classify the tweets and analyse the results. In this project we aim to predict the sentiments from tweets by checking the polarity of tweets as positive, negative or irrelevant. Sentiment analysis is a process of deriving sentiment of a particular statement or sentence. It's a classification technique which derives opinion from the tweets and formulates a sentiment and on the basis of which, sentiment

classification is performed. Sentiments are subjective to the topic of interest. We are required to formulate that what kind of features will decide for the sentiment it embodies. In the programming model, sentiment we refer to, is class of entities that the person performing sentiment analysis wants to find in the tweets. The dimension of the sentiment class is crucial factor in deciding the efficiency of the model. For example, we can have two-class tweet sentiment classification (positive and negative) or three class tweet sentiment classification (positive, negative and irrelevant). Sentiment analysis approaches can be broadly categorized in two classes – lexicon based and machine learning based. Lexicon based approach is unsupervised as it proposes to perform analysis using lexicons and a scoring method to evaluate opinions. Whereas machine learning approach involves use of feature extraction and training the model using feature set and some dataset.

The basic steps for performing sentiment analysis includes data collection, pre-processing of data, feature extraction, selecting baseline features, sentiment detection and performing classification either using simple computation or else machine learning approaches. Features are like Parts-of speech features i.e. nouns, adverbs, adjectives, etc. in each tweets are tagged. We for the accuracy purpose of polarity will be detecting sentiments along with various knowledge base patterns and multiple machine learning strategies to evaluate the sentiments. Alongside we will be checking if the tweet is genuine or not or if has influenced by other tweets which can be very useful in rumours mitigation on social medias. This

approach will produce the higher accuracy for polarity by considering POS factor and genuineness as well as can be used in various sectors such as analysing product reviews or government policies, etc. where it can be found if negative influence is spread and if it affects people.

II LITERATURE REVIEW

[1] Characteristics Analysis of Data from News and Social Network Services

Author: - Beakcheol Jang

Year: - 2018

In this study, we conducted comprehensive measurements to understand the characteristics, including similarities and differences, of data from the news and SNSs. The observed differences are as follows: It is challenging to find the same topic in the news and SNS. The news responds to official events whereas SNSs respond to personal interests. The news mentions a specific topic continually, whereas the transition from one topic to another in SNSs is fast. The issues discussed on SNSs are different every day. The news can identify specific events with a single keyword, but many keywords are required to find the required data in SNSs.

[2] Multi-Strategy Sentiment Analysis of Consumer Reviews Based on Semantic Fuzziness

Author: - YING FANG AND JUN ZHANG

Year: - 2018

A new method for the calculation of polarities and strengths of Chinese sentiment phrases is proposed in this study, which could be used to analyse semantic fuzziness of Chinese. It uses a probability value, rather than xed value for the polarity strengths of sentiment phrases, compared with the conventional methods.

[3] A Pattern-Based Approach for Multi-Class Sentiment Analysis in Twitter

Author: - MONDHER BOUAZIZI AND TOMOAKI OHTSUKI

Year:-2017

In this project, we have proposed a new approach for sentiment analysis, where a set of tweets is to be classified into 7 different classes. The obtained results show some potential: the accuracy obtained for multi-class sentiment analysis in the data set used was 60.2%. However, we believe that a more optimized training set would present better performances.

[4] Security Attack Prediction Based on User Sentiment Analysis of News Data

Author: - Aldo Hernández Victor Sanchez

Year: - 2016

This project proposed a sentiment analysis method for news based on a linear regression model. The method employs natural language processing analysis on a collected corpus and determines negative sentiments within a specific context. The objective is to predict the response of specific groups involved in hacking activism when the sentiment is negative enough among different News users.

[5] Exploring Sentiment Analysis on News Data

Author: - Manju Venugopalan and Deepa Gupta

Year: - 2015

A hybrid news sentiment classification model incorporating domain oriented lexicons, unigrams and news specific features using machine learning techniques has been developed and the classification accuracies have been found to improve by an average of around 2 points across different domains. The effectiveness of incorporating concepts of domain specificity in the polarity lexicon and the capacities of explicit news features to extract sentiment has been validated. Pruning the unigrams based on their significant presence in a class has simplified the model to a large extent.

[6] Prediction of Election Result by Enhanced Sentiment Analysis on Twitter Data using Word Sense Disambiguation

Author: - Rincy Jose and Varghese S Chooralil

Year: - 2015

In this project, we have implemented a real time, domain independent twitter sentiment analyser using sentiment lexicons such as SentiWordNet and WordNet. It compared political sentiment towards two politicians by plotting graphs using results of sentiment analysis on real-time extracted twitter data. This was done by applying WSD and negation handling in order to increase accuracy of sentiment analysis. Negation handling results in 1% improvement in classification accuracy and WSD results in 2.6% improvement in classification accuracy.

III EXISTING SYSTEM

In Existing System, to analyses the behavior of news required maximum resources. To analyze the fake news, we required man power to deep down into it and check the authentication of news. We have to check all possible connection with news manually. It is time consuming and costly approach. Limitation of existing system:-

- Time Consuming Process
- Man-Power Required.

- Deep Knowledge required.
- Cost driven approach.

IV PROPOSED SYSTEM

In the proposed system, we will retrieve tweets from twitter using twitter API based on the query. The collected tweets will be subjected to pre-processing. We will then apply the various patterns and strategic algorithms including some of machine learning algorithms for NLP to supervise the data. The results of the algorithms i.e. the sentiment and influence will be represented in graphical manner (pie charts/bar charts). The proposed system is more effective than the existing one. This is because we will be able to know how the statistics determined from the representation of the result can have an impact in a particular field as well as influence of negativity spread by rumors.

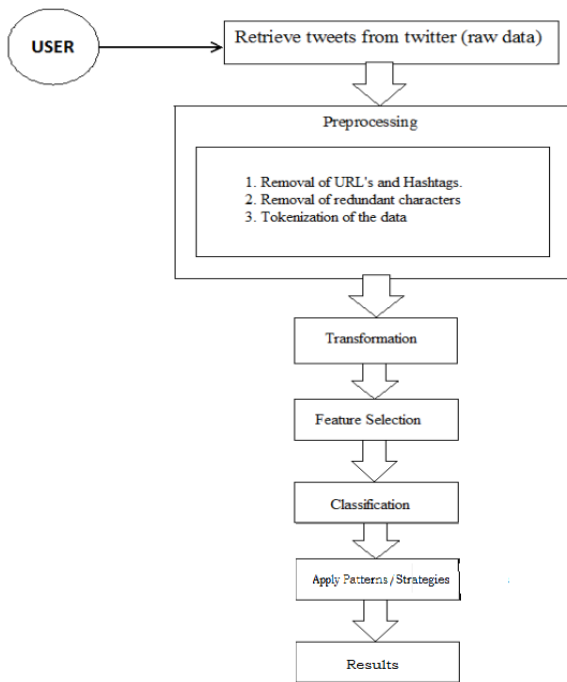


Figure-1. Architecture Diagram

V. RESULT & DISCUSSION

In proposed system we have created one web based application using Python’s Flask framework which is light weight. In proposed application we are fetching real time tweets from twitter data and applying algorithm on them to get result out of that. To access data from twitter, you need to have authenticate twitter developer account which allows you to access the data. After accessing the data we are also storing that data into SQL database. Then we applied algorithms on that data. For sentiment analysis, we are using text blob and NLTK libraries. And for fake news detection, we have used TFIDF algorithm. It’s taking approximately two to five minutes for execution.

According to network complexity it fetch tweets from server and process them. Following screenshot shows the final output of project which has interpreted COVID19 keyword on twitter and which is accurate and efficient..



Figure -2: Result Screen Shot

VI CONCLUSIONS

The project set out to solve a practical problem of sentiment analysis and genuinely check of Twitter posts. We proposed a method using knowledge base patterns, strategies and machine learning approaches. These methods are proposed to increase the accuracy of sentiment check for tweets. Patterns can be used to evaluate if the tweets was a influenced rumor or a genuine post by any user. By using API of twitter it is possible to work on live tweets than to work on offline data. Querying and fetching of particular tweets from twitter is possible by using its API. Finding influence or negativity spread by users can be useful in various analytical tasks.

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