



SURVEY ON TWITTER SENTIMENT ANALYSIS USING MACHINE LEARNING

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ABSTRACT - Sentiment analysis manages distinguishing and classifying opinions or sentiments communicated in source message. Social networking sites like twitter have a large number of people share their contemplations step by step as tweets. As tweet is trademark short and fundamental method of articulation. The Sentiment Analysis sees as area of message data in Machine Learning. The exploration of sentiment analysis of Twitter data can be acted in various perspectives. This paper shows sentiment analysis types and methods used to perform extraction of sentiment from tweets. In this paper surveyed different Machine Learning techniques and approaches of sentiment analysis having twitter as a data.

Keywords: [Sentiment analysis, Facebook, Twitter, Machine Learning, Neural Networks, Naïve Bayes, Hybrid.]

1. INTRODUCTION

Sentiment is naturally energetic from one person to another, and could be outright senseless. It's crucial for mine an immense and important instance of data while endeavouring to assess sentiment. No particular data point is fundamentally significant. A singular's sentiment toward a brand or thing might be affected by in any event one backhanded causes; somebody might have an appalling day and tweet a threatening comment about something they generally had a truly fair assumption about. With a sufficiently gigantic model, special cases are debilitated in the total. Depression has turned into the world's fourth significant sickness. Contrasted and the high occurrence, nonetheless, the rate of depression clinical treatment is extremely low due to the trouble of conclusion of mental issues. As indicated by the World Health Organization (WHO) survey in 2012 in excess of 350 million people were experiencing depression and very nearly 1 million people with depression end their lives every year. Depression is additionally called clinical depression or burdensome issue that is a mental problem portrayed the disturbance in that frame of mind, misery, consultation, loss of interest, and sensation of responsibility that influences how you feel, thinks, and handles day to day exercises. Social Networking Sites (SNS) is an online local area where people across the world, independent of demographic and geographical contrasts, can make a network with various organizations

or people to share and communicate their ideas, opinions, and feelings with one another.

The advanced level exploration in a few examinations has zeroed in on affirming social media perceptions, which builds our aggregate trust in these data esteems that go about as a hotspot for observing health issues and patterns. Twitter is a social media application that permits clients to communicate news, information, and individual updates to different clients in tweets or explanations of 140 characters or less. Sentiment analysis is the process of determining the emotional tone behind a progression of words, used to acquire a comprehension of the mentalities, opinions, and emotions communicated in a message. It is a method for assessing composed or communicated in language to decide whether the articulation is positive, or negative, or unbiased. The capacity to remove sentiment and emotions experiences from social data is a training that is broadly taken on by organizations across the world. In this paper present that how to help a machine to investigate the different grammatical subtleties, social varieties, separate emotions, and find sentiment and importance behind that words utilizing machine learning techniques.

2. LITERATURE SURVEY

1. P. Kalaivani and D. Dinesh (2020) et.al proposed Machine Learning Approach to Analyze Classification Result for Twitter Sentiment. Data mining or investigation of information is the method involved with dissecting a tremendous measure of data and afterward removing the importance of the data. It gathers the obscure prescient information from huge archives and it is an imaginative field with incredible experience to assist organizations with zeroing in on the main information in their data distribution centers Sentiment analysis is a cycle that decides a client's demeanor, assessment, and feeling connected with the point or item. The proposed strategy characterizes the data into positive and negative. Crafted by the proposed model has gone through bringing of data from the site which is unclassified data followed by pre-handling where the data is marked in terms of polarity, and subjectivity, feature extraction, classification, and execution gauges specifically accuracy. The relative perceptions are taken against SVM and BPNN methods and the outcomes show that SVM performs well when contrasted and BPNN.

2. G. Shetty (2020) et.al proposed Sentiment Analysis and Classification on Twitter Spam Account Dataset. How much people utilizing social media is exceptionally huge and is expanding at an extremely quick rate. The effect of public figures in social media is very enormous. A large number of people utilize social media stages to articulate their thoughts and monitor social issues and patterns. This cooperation with social networking destinations has impacted their lives in social media stages like twitter and Facebook prevalence and how much people following you assumes a significant part. Presently assuming this prevalence depends on counterfeit records or spam accounts, it makes issues like presenting inaccurate information to their adherents through counterfeit records which brings about spreading of noxious and manipulative substance. In this undertaking we zeroed in on spam detection, and to introduce a few starter aftereffects of a framework that targets accelerating the course of spam account detection on Twitter. To this point, different classification methods were utilized alongside sentiment analysis for better comprehension the proposed framework with additional alteration can be utilized to examine the sentiment of the people for different purposes and alongside that a similar framework can be utilized for some other social networking locales like Facebook, Instagram, Orkut, and so on.

3. S. A. El Rahman (2019) et.al proposed Sentiment Analysis of Twitter Data. The online social media such as Twitter, Facebook, and Instagram allow users to communicate with the whole world. Write their own opinions about products or share their moments, even influence politics and companies. Twitter for example, almost every huge company has an account on Twitter to know about their customer's feedback about their services or products. Sentiment analysis, known as opinion mining, for classifying specific words into positive or negative Sentiment analysis is a field of study for analyzing opinions expressed in text in several social media sites. Our proposed model used several algorithms to enhance the accuracy of classifying tweets as positive, negative and neutral. Same methodology can be used in various fields, detecting rumors on Twitter regarding the spread of diseases. For future work, an algorithm that can automatically classify tweets would be an interesting area of research.

4. S. Saini (2019) et.al proposed Sentiment Analysis on Twitter Data using R. These days, technology has got its new and higher pace. This development has changed human's way of expressing their opinions, sentiments and views and the platforms. By the above given sentiment analysis, we conclude that for E-healthcare people have positive opinion and sentiment as its positive sentiment score is higher than negative sentiment score. This paper takes the perspective of analyzing social sentiment of various ailments. This is a much curated set and does not account for location aggregation and though it shows a varied range of 10 different sentiments, there is still scope further for a large-scale analysis along with weightage assignment to the different sentiments for a more refined analysis as future work for this research. Location aggregation-based analysis will provide exact insight about region specific sentiments, while weightage

assignment will provide clear segregation of sentiment boundaries.

5. E. D. Sri Mulyani (2019) et.al proposed Analysis of Twitter Sentiment Using the Classification of Naive Bayes Method about Television in Indonesia. The improvement of mass media in the country encountered a genuinely lengthy turn of events. Beginning from the underlying appearance, it tends to be arranged as follows: Internet-based newspapers, magazines, radio, television and online mass media portals. Twitter is one of the microblogging social media types. By utilizing twitter, users can compose a particular point momentarily. Aside from being audio-visual based, with the goal that it effectively draws in public consideration, television is additionally simple and economical to get to. At present there are numerous television stations, both inside the scope of public and neighborhoods. This surely has a positive effect in speeding up the dissemination of information and schooling in the country. Analysis of public sentiment towards television shows through feelings composed on twitter social media can give information as public sentiment evaluation about television shows. The value of accuracy coming about because of the classification model in regards to twitter sentiment about television shows with the Naive Bayes method is 91.67%.

6. L. Wang (2019) et.al proposed SentiDiff: Combining Textual Information and Sentiment Diffusion Patterns for Twitter Sentiment Analysis. Twitter, a popular micro-blogging service around the world, has been shaping and transforming the way people obtain information from people or organizations that they are interested in. On Twitter, users can publish status update messages, called tweets, to tell their followers what they are thinking, what they are doing, or what is happening around them. In addition, users can interact with another user by replying to or reposting his/her tweets. Mining sentiment polarities expressed in Twitter messages is a meaningful while challenging task. We then build a sentiment reversal prediction model, and design a novel Twitter sentiment classification algorithm called SentiDiff. In SentiDiff, the between connections between literary data of Twitter messages and opinion dispersion designs are thought of, and the textual data based sentiment classifier and the sentiment reversal prediction model are combined in a supervised learning framework.

7. S. E. Saad (2019) et.al proposed Twitter Sentiment Analysis Based on Ordinal Regression. With the quick progression of social networks and micro blogging websites and twitter is an extensively used micro blogging stage and social networking service that delivers a huge proportion of information. Twitter sentiment analysis is correct now a well known subject for research. Such analysis is significant since it aggregates and arranges general appraisal by examining huge social data. Regardless, Twitter data have specific attributes that cause trouble in driving sentiment analysis instead of separating various types of data. With regards to this work, we present a methodology that expects to remove Twitter sentiment analysis by building a changing and scoring model, consequently, classifying tweets into a couple of ordinal classes using AI classifiers. Classifiers, for instance, Multinomial strategic relapse, Support

vector relapse, Decision Trees, and Random Forest, and are used in this examination. This methodology is progressed using Twitter data set that is straightforwardly available in the NLTK corpora resources.

8. S. Dhawan (2019) et.al, proposed Sentiment Analysis of Twitter Data in Online Social Network. Sentiment is normally energetic from one individual to another, and can even be total silly. It's crucial for mine a gigantic and significant instance of information when endeavoring to assess sentiment. Sentiment Analysis is the methodology of computationally choosing if a touch of creating is sure, negative or nonpartisan. It's generally called notion mining, deriving the sentiment or temper of a client. In this paper, an endeavor has been made to propose analysis technique for sentiment of twitter dataset. In proposed strategy polarity of each tweet is ascertain to recognize whether tweet is positive or negative. A sentiment polarity is the emotions of client like angry, sad, and happy and joy. The proposed instrument has been carried out in Python. In this paper writing a sentiment polarity based sentiments analysis system for twitter dataset in online informal organizations. In the proposed calculation, twitter dataset is gotten from twitter API for analysis of sentiments emotions of various clients. Here we check sentiment polarity of each tweet. The sentiment polarity is emotions of clients like joy, happy, sad and angry. On the off chance that the sentiment polarity is equivalent to nothing, tweet is neutral and assuming polarity is more prominent than nothing, tweet is positive in any case, tweet is negative. Thusly proposed calculation recognizes tweets dependent on sentiment polarity of each tweet of users.

9. H. Elzayady (2018) et.al, proposed Sentiment Analysis on Twitter Data using Apache Spark Framework. Sentiment analysis has turned into an interesting field for both investigation and current regions. The enunciation sentiment suggests the feelings or contemplated the person across a few explicit issues. Furthermore, it is moreover seen as an immediate application for assessment mining. In this investigation, we propose a useful sentiment assumption strategy, utilizing the Apache Spark's Machine Learning library to execute unmistakable classification calculations. The results exhibit a basic redesign in the accuracy of Naive Bayes and Logistic Regression with respect to growing the volume of dataset, while the improvement isn't strong in Decision Trees, moreover, test's results derive that there is a converse comparing association between running time and the amount of machines in the Spark Cluster, So in case of adding extra center points in the bundle, better capacity will be gotten. From the past outcomes, our framework can be depicted as strong and adaptable. For not really far off future, we hope to dissect the effect of including others different features the information vector and use greater datasets. In addition, we will most likely development an online help that gets benefits by the Spark Streaming which is considered as an Apache Spark's library for directing streams of data that gives the users with a continuous assumptions and investigation about sentiments of required subjects.

10. F. W. Kurniawan (2020) et.al proposed Indonesian Twitter Sentiment Analysis Using Word2Vec. Nowadays, social media has been increasingly popular.

Social media has become a platform for its users to exchange ideas regarding certain issues or topics such as sport, politics, finance, lifestyle, and so on. Twitter is one of the social media used by Indonesian. According to data from Statista, the amount of Twitter users in Indonesia reached 22.8 million¹. Twitter user writes their opinion in the form of tweets to be displayed in public. Public opinion has been widely used to grasp sentiment about a certain topic, product, or someone. Based on the test result of sentiment classification, it can be concluded that the difference in word2vec model architecture affects the classification result. The skip-gram 100-dimension model provided the best classification results with the precision of 64.4%, recall 58%, and f-score 61.1%. The best classification result was obtained when using 1010 training data. This test found that there were 577 words that were not found in the model. For further research, a greater amount of dataset could be used to increase data variation, as well as a stop word list that is more suitable with the dataset could be applied for a cleaner pre-processing result.

11. J. Akaichi (2013) et.al proposed Social Networks Facebook Statutes Updates Mining for Sentiment Classification. As of late message mining and sentiment analysis stand out because of the wealth of assessment data that exist in social networks like Facebook, Twitter, and so forth. Existing sentiment analysis studies will more often than not distinguish client ways of behaving and condition of psyches however stay lacking because of intricacies in conveyed messages. In this examination paper, we center on the use of message mining for sentiment classification. Illustration is performed on Tunisian users' situations with "Facebook" posts during the "Arabic Spring" period. Our point is to extricate helpful information, about users' sentiments and ways of behaving during this sensitive and huge period. For that reason, we propose a method in light of Support Vector Machine (SVM) and Naïve Bayes. We likewise build a sentiment vocabulary, in light of the emojis, contributions and abbreviations', from removed situations with. Also, we play out a few near tests between two machine learning algorithms SVM and Naïve Bayes through a preparation model for sentiment classification.

12. M. S. Islam (2016) et.al proposed supervised approach of sentimentality extraction from Bengali facebook status. Sentiment is the main things that different human and machine. To reproduce the feelings for machines numerous specialists have been attempting to make method and robotized the interaction to extricate assessment of specific news, item or life substance. Sentiment Analysis (SA) is a mix of opinions, emotions and subjectivity of a message. As of now SA is the most requesting task in Natural Language Processing. Social networking site like Facebook are for the most part utilized in offering the viewpoints about a specific substance of life. Newspaper distributed news about a specific occasion and client communicated their feedback in news remarks. Online item feedback is expanding step by step. So audits and opinions mining assume a vital part in grasping people fulfillments. Such assessment mining has potential for information disclosure. The primary objective of SA is to find opinions from message separate sentiments from them and characterize their

polarity, i.e positive or negative. In this area the vast majority of the model was intended for English Language. This paper portrays a clever methodology utilizing Naïve Bayes classification model for Bengali Language. Here an administered classification method is utilized with language rules for recognizing sentiment for Bengali Facebook Status.

13. H. M. S. Aung (2020) et.al proposed Analysis of Word Vector Representation Techniques with Machine-Learning Classifiers for Sentiment Analysis of Public Facebook Page's Comments in Myanmar Text. In this paper, ongoing advancement on space division multiplexed (SDM) transmission and our proposition of thick SDM (DSDM) with in excess of 30 spatial channels toward limits past petabytes/s. Moreover, we examine the necessities for acknowledging long stretch DSDM transport frameworks utilizing multicore as well as multimode fiber, including power and space productive intensification conspires, the utilization of fibers with enormous viable regions and transmission lines with low intercore crosstalk, low differential mode delay (DMD), and low mode dependent loss (MDL). Reviewed record heterogeneous 12-core \times 3-mode fiber with low crosstalk, low DMD, and low MDL, equal different info and various result signal handling, low mode dependent increase Erbium-doped fiber intensifiers, and MDL evening out innovations are critical as respects expanding the scope of multicore and multimode transmission. We audit our significant distance transmission probe polarization-division multiplexed 16-quadrature amplitude modulation signaling over 12-core \times 3-mode fiber.

14. A. Elouardighi (2017) et.al proposed a machine learning approach for sentiment analysis in the standard or dialectal Arabic Facebook comments. Social networks like Facebook contain a colossal measure of data, called Big Data. Separating important information and patterns from these data allows a superior comprehension and decision-production. As a general rule, there are two classes of ways to deal with address this issue: Machine

Learning approaches and dictionary based approaches. The cycle begins by gathering and setting up the Arabic Facebook comments. Then, a few blends of extraction (n-grams) and weighting schemes (TF/TF-IDF) for features development are directed to guarantee the best exhibition of the created classification models. Our Machine Learning approach utilizing sentiment analysis was executed determined to break down the Facebook comments, written in Modern Standard Arabic or in Moroccan Dialectal Arabic, on the Morocco's Legislative Elections of 2016. The outcomes acquired are promising and encourage us to continue dealing with this subject.

15. Nahar KM (2020) et.al proposed Sentiment analysis and classification of Arab Jordanian facebook comments for Jordanian telecom companies using lexicon-based approach and machine learning. Sentiment Analysis (SA) is a technique utilized for recognizing the polarity (positive, negative) of a given message, utilizing Natural Language Processing (NLP) techniques. Facebook is an illustration of a social media stage that is generally utilized among people living in Jordan to offer their viewpoints in regards to public and extraordinary center regions. In this paper, we executed the lexicon-based approach for recognizing the polarity of the Facebook comments. The data tests are from nearby Jordanian people remarking on a public issue connected with the services given by the primary telecommunication organizations in Jordan. The delivered results with respect to the assessed Arabic sentiment lexicon were promising. By applying the client characterized lexicon in light of the normal Facebook posts and comments utilized by Jordanians, it scored (60%) positive and (40%) negative. Utilizing administered Machine Learning (ML) algorithms that are normally utilized in polarity classification, the specialists acquainted them with our formed dataset. The consequences of the classification were 97.8, 96.8 and 95.6% for Support Vector Machine (SVM), K-Nearest Neighbor (K-NN) and Naïve Bayes (NB) classifiers, individually.

3. PROPOSED METHODS, MERITS AND DEMERITS

Authors	Proposed Method	Merits	Demerits
P. Kalaivani (2020)	Machine Learning Approach to Analyze Classification Result for Twitter Sentiment	Data from the website which is unclassified data followed by pre-processing where the data is labeled in terms of polarity, and subjectivity, feature extraction, classification, and performance measures namely accuracy.	The problem is that most classification algorithms use simple phrases to express sentiment about a product or service.
G. Shetty (2020)	Sentiment Analysis and Classification on Twitter Spam Account Dataset	The problem of unbalanced dataset in sentiment classification is solved efficiently and appropriately.	The under-sampling method is complex to classify the sentiments and it is a time-consuming process
S. A. El Rahman (2019)	Sentiment Analysis of Twitter Data	Sentiment analysis is a field of analyzing opinions expressed in text in several social media sites.	Sentiment analysis are some challenges in a range of scenarios, in terms of architecture and application domains with unclear or scarce datasets.

S. Saini (2019)	Sentiment Analysis on Twitter Data using R	Data collection and data cleaning is the very important or essential part of sentiment analysis.	Without data collection sentiment analysis is impossible and without data cleaning sentiment analysis is useless because that will be inaccurate.
E. D. Sri Mulyani (2019)	Analysis of Twitter Sentiment Using the Classification of Naive Bayes Method about Television in Indonesia	Application of Twitter Sentiment Analysis Using the Naïve Bayes Classification Method Regarding Television Shows in Indonesia.	Large number also causes side effects, namely the failure to monitor television broadcasts effectively.
L. Wang (2019)	SentiDiff: Combining Textual Information and Sentiment Diffusion Patterns for Twitter Sentiment Analysis	Twitter sentiment analysis only considers textual information of Twitter messages, and cannot achieve satisfactory performance due to unique characteristics of Twitter messages.	Sentiment diffusion patterns differ in different topics is not possible and considers the topic information of Twitter messages when fusing textual and sentiment diffusion information.
S. E. Saad (2019)	Twitter Sentiment Analysis Based on Ordinal Regression.	Twitter is the most frequently used social network service where we share our opinions, discuss, and share feelings in a short path because of limited text.	Twitter data have certain characteristics that cause difficulty in directing sentiment analysis as opposed to examining different kinds of data.
S. Dhawan (2019)	Sentiment Analysis of Twitter Data in Online Social Network.	The sentiment polarity is emotions of users like joy, happy, sad and angry.	Not analyzing image and video sentiments of twitter data.
H. Elzayady (2018)	Sentiment Analysis on Twitter Data using Apache Spark Framework	Spark Cluster adding extra nodes in the cluster, higher performance capability will be obtained and effective and scalable.	The input vector and use larger dataset managing streams of data not gives the users with real time predictions.
F. W. Kurniawan (2020)	Indonesian Twitter Sentiment Analysis Using Word2Vec.	These are the good words about the target in consideration. If the positive sentiments are increased, it is referred to be good.	These are the bad words about the target in consideration. If the negative sentiments are increased, it is discarded from the preference list.
J. Akaichi (2013)	Social Networks Facebook Statutes Updates Mining for Sentiment Classification	Achieve high accuracy for classifying sentiment while consolidating various features.	The time reliance of our data and investigate their stylish subjects dynamically.
M. S. Islam (2016)	Supervised approach of sentimentality extraction from Bengali facebook status.	Easily know the level of item acknowledgment and make their technique to further develop the item quality.	Data corpus can't be upgraded and work on handled calculation to accomplished better accuracy.
H. M. S. Aung (2020)	Analysis of Word Vector Representation Techniques with Machine-Learning Classifiers for Sentiment Analysis of Public Facebook Page's Comments in Myanmar Text	To acknowledge significant distance DSDM transmission grew low crosstalk, low MDL transmission line with a low MDG FM-EDFA.	To Improve Power proficient multicore/multi-mode enhancers, optical gadget joining, and power limit.
A. Elouardighi (2017)	A machine Learning approach for sentiment analysis in the standard or	The application of a features selection method allowed us to decrease the	The size of the dataset is still little, strong ends require most certainly bigger datasets.

	dialectal Arabic Facebook comments	dimensionality while keeping up with the presentation.	
Nahar KM (2020)	Sentiment analysis and classification of Arab Jordanian facebook comments for Jordanian telecom companies using lexicon-based approach and machine learning.	The lexicon was utilized to name a bunch of Facebook comments to figure out a big dataset of unlabeled comments.	The planned lexicons can't improved by adding new expressions.

CONCLUSION

Machine Learning techniques are easier and effective than Symbolic techniques. These techniques can be applied for twitter sentiment analysis. There are sure issues while managing distinguishing emotional keyword from tweets having multiple keywords. The analysis of Twitter data is being done in various perspectives to mine the opinion or sentiment. This survey paper analyzed various techniques of sentiment analysis and Machine Learning methodologies for sentiment analysis.

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