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# Behavioral Analysis of User Data on Social Media Applications using Machine Learning Algorithms

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## ABSTRACT

*This paper is developed to predict user behaviour as cyber bullying on social media by using machine learning algorithms in the big data era. In online platform the use of electronic applications to bully a person by sending messages in the form of aggressive behavior of intimidating or threating nature is termed as cyber bullying. These social networks are the result of long process that began around the 1960's which created the first public network. Social media brings together everyone in an online community where one can communicate, share, post, explore, or stay in touch with one another. We can simply say that social media has changed the way we live. Along with the benefits on one side we can't ignore the facts that social media also pose a serious threat to human. In this paper these threats are considered as human aggressive behavior and we have classified it as bullying words and are categorized as filters which include sections like threats, offensive, abusive, harassment, sexual, violence and so on. The use of these social media has been one of the reason for the generation in huge amount of data and in order to manage and solve real–world problems we use big data along with ML. The machine learning techniques like text-classification approach and lexicon based model are used to categorize the collected data from user and detect the presence of cyberbullying activity. Once the bullying activity is detected we can block that comment automatically which then sends alert message to bully and also to cyber-victim, and also keep the count on number of times the bully words are used. As a result, the admin who has all the privileges can monitor the bullying activity based on the count and can take further action whereas the application will have already blocked the comment which contained the bully word thus leaving no harm to victim. The work presented here has profound implications for future studies of cyberbullying and may one-day help to solve the problem of cyberbullying in social media and other online platforms.*

***KEYWORDS:*** *Cyberbullying, text-classification, lexicon based model, aggressive human behavior, filters, big data, machine learning, social media, cyber-victim, bully.*

## INTRODUCTION

In the running 21 century where social media is considered to be the most important activity, that helps people to gain more experience. We can simply say social networking through various media has changed the way we live. Due to the regular increase in internet users from all over the world social media has a substantial impact on humans, their communication, work and relationship in today's society, which has further

increased the rate from millions to billions in terms of internet usage for operating social media. Social media has made people possible to communicate with anyone from anywhere at any time offering them to engage in social interactions[17].

In order to look after human behavior and manage such huge amount of data, Now-a-days social media is undergoing a lot of transformations and all thanks to technologies like machine learning or deep learning algorithms which helps researchers understand big data [1]. Machine learning hold big data sets in order to get insights and optimize social media. In fact, social media produce vey huge amount of data on daily basis. And to gain information about each individual user we need to translate that data. Machine learning or deep learning have helped researches to predict various human behavior patterns along with big data which makes it easy to store, retrieve and extract abundant information on humans and the data of their social activities can be stored and obtained in this big data era. The advancement in machine learning and big data have been helping researches to make predictions on wide range of future applications by analyzing various forms of patterns, considering this social technology have created an uprising in user-generated information, online human networking, and rich human behavior-related data. however, we can't tend to ignore the misuse of these social media pose a new form of serious threat, aggression, and violence against humans in the same online platform which is termed as cyberbullying. There are various studies to demonstrate that online platforms like social media are being used for bullying. And researchers have come up with various measures to stop cyberbullying and all these measures are manual process which takes a lot to time to process and detect threats. In order to solve this problem machine learning algorithm with big data are required to process this information quickly and introduce algorithms that can automatically detect threats [2].

Well the goal of this paper is to develop machine learning algorithms that can improve the manual monitoring of cyber bullying on online platforms into automatically detecting the aggressive human behavior from user end itself before they make a move to post threats. While a lot of research related to this focuses on detecting cyberbullying the present study focuses on a broad range of predicting cyber bullying by giving a form of filters with text- classification approach and lexicon based approach.

We propose a machine learning method to cyberbullying prediction by making use of random forest algorithm along with varied features. To our knowledge this is the first approach of using filter based word classification related to cyber bullying and in prediction of events like threats. For now, this paper focuses on single language i.e. filters based on only English well the methodology adopted can be used for varied other languages also.

**RELATED WORK**

State-of-the art research has developed many attributes to upgrade the performance of cyberbullying predictions. There are many related works on the topic cyberbullying various authors have come up with different measures in detecting cyber bullying. Social media with accurate future forecasts and method like data-driven model, theory-driven model and some physics laws, theories have been implemented to show the topics which are relevant to users and to see how the users interact with social media and make successful predictions [3]. Other means to automatically detect cyber bullying provides high accuracy using a naïve Bayes machine learning approach [4] which states the separation of unrecognized data presence in the given class feature. This further helped in detecting cyber bullying on explicit languages based on concern of sexuality, race, culture, and intelligence [5]. For example, people were being bullied based on their skin tone and using this in online platform like social media caused a serious threat. It helped to develop gender based approach to classify discrimination which was a type used for bullying [10] [11]. Another type of detecting cyberbullying is by using deep learning and by using neural networks to reduce the problem of unwanted data and bullying data [6]. Then later with increase in use of local abusive language they further developed supervised classification techniques (algorithms that learn from labelled data) with categorizing text data by NLP (Natural Language Processing) feature to analyze the data which was better than deep learning approach [7]. And then abusive language was characterized as set of pre-defined abusive words using SVM classifier [8]. For example, a list of abusive words was created and the amount of harm those abusive words could perform were fed into machine learning. Later, to deal with abusive words in social media target words were formed known as lexical syntactic feature along with user sentiments were added as

features. And in later days SVM classifiers were used to manually classify bullying and non-bullying activities. Detection of cyberbullying on social media were split in 3 stages namely Preprocessing, feature extraction and classification step [9]. And furthermore it helped in the visibility of automatically detecting cyber bullying [2] using a linear kernel support vector machine (SVM) along with binary classification which gave the classification based on two classes using keyword–based approach. For example, consider a keyword bad where binary classification was performed to classify it as either bullying or non-bullying.

**PROBLEM STATEMENT**

Based on the related work we found that there are a various number of methods and approaches for detecting cyberbullying, but even with all these advancements in technology cyberbullying has not come to an end. Social media as an online community connects millions to billions of people all around the globe where one can exchange thoughts and communicate with in fractions of seconds from anywhere around the globe. According to recent surveys the amount of data is said to be growing exponentially. The best estimate suggests that at least 2.5 quintillion bytes of data is produced every day. This amount of data is being generated from many number of sources like social media platforms, online networking, online banking, e-commerce, online education are all some different sources. And in order to manage this big data plays vital role. In today's world of wide spread social networking social media websites have mainly four features: Collaboration, Participation, Empowerment, and Timeliness [3]. In the online platform like social media the users tend to show human aggression and violence in various way [4]. With benefits of social media on one side it also made users show their aggressive behavior and this can be summarized in two ways: OSN communication and social Media websites [5] [6] [7]. So far social media is the online platform where people can exchange thoughts, message one another, link with people, share photos and videos, and with all this it helps connect billions of people around the globe varying their aggressive behavior. Therefore, by this social media help cyber criminals reach many users. This related work leads to implement effective approach to solve the problem by using an application. Our application works to predict human aggressive behavior termed as cyber bullying in social media using machine learning algorithms in big data.

**MOTIVATION**

The above said problem statement and related work leads to a motivation to implement an application to predict human forms of aggressive behavior using Machine learning and big data. Machine learning allows applications to become accurate in predicting various outcomes. Moreover, machine learning has the ability to develop itself. And the main aim for using machine learning is to predict bullying activity quickly without human intervention. Machine learning has become crucial in numerous areas and successfully produced many models, tools, and algorithms. And it also helps in study of pattern recognition. pattern recognition is something that helps online platforms like social media work magnificently with the users and their data. Machine learning is important because as models are exposed to new data, they are able to independently adapt. Now-a-days every single person is connected by social media where data is continuously exchanged every day rather every moment. And in order to manage such huge amount of data that is growing exponentially with time big data is used. With Machine learning and big data large amount of data can be handled to solve real-world problems. SM websites allow users to connect and communicate with other users regardless of their location, thus expanding cyberbullying beyond physical location.

**PROJECT OBJECTIVE**

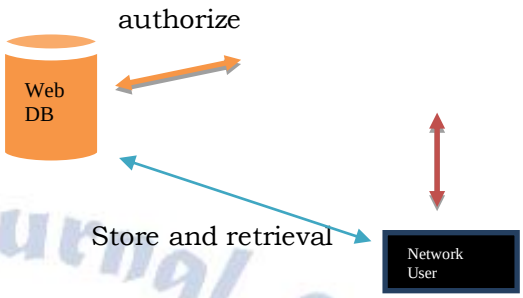
1. The objective of the system is to reveal, analyze and stop cyberbullying in social media applications.
2. The objective is to identify the occurrence of cyberbullying activity in social media platform which helps the government to yield force before many end-users enhance their Target of cyberbullying.
3. The objective of the system is to give alert message like sending notifications to cyber-victim and to bully (another user) in order to warn them, and to identify short hand text and human aggressive behavior on the comment sections.
4. Also to generate a report which contains the details of bully, and to keep track of count (number of times he tried to bully someone) and also by blocking that person along his comment without letting it reach to victim.

**PROPOSED SYSTEM**

Social media as an online platform provides users an opportunity to create online community where people can share, post and exchange information. And in order to manage such huge amount of data and to prediction bullying, the proposed system is to construct cyberbullying prediction models where we use a text classification as filter that involves the construction of machine learning classifiers from labeled text instances. Another means is to use a lexicon-based model that involves computing orientation for a document from the semantic orientation of words or phrases in the document. Generally, the lexicon in lexicon based models can be constructed manually or automatically by using seed words to expand the list of words. However, cyberbullying prediction using the lexicon based approach is rare in literature.

The primary reason is that the texts on social media websites are written in an unstructured manner, thus making it difficult for the lexicon-based approach to detect cyberbullying based only on lexicons. However, lexicons are used to extract features, which are often utilized as inputs to machine learning algorithms. For example, lexicon based approaches, such as using a profane-based dictionary to detect the number of profane words in a post, are adopted as profane features to machine learning models. The key to effective cyberbullying prediction is to have a set of features that are extracted and engineered.

The proposed system is more effective due to logistic regression classification which is a predictive analysis used to describe data and to explain the relationship between them, and unsupervised machine learning for cluster analysis whose task is to group the objects more similar to each other than to those is other groups, and by analyzing them to find the hidden patterns or group the data.




1. Register and Login.
2. View your Details and Search Friends, request.
3. Post Your messages with images like title, title description with browse option, uses, Title image.
4. View and Comment on your friend post
5. View all your friends post and comment (don't post if comment consist cyber bulling and show the reason why comment is not posted by indicating Detect Cyber Bulling words (fine number of items found for a corresponding post like violence (No. Of words), Vulgar (No. of Words), Offensive (No. Of Words), Hate (No of Words, Sexual (No. of Words)))

**Fig:** system architecture with two users': admin and local user along with database which can be accessed by both users with different features.

**RESULT AND SNAPSHOTS**

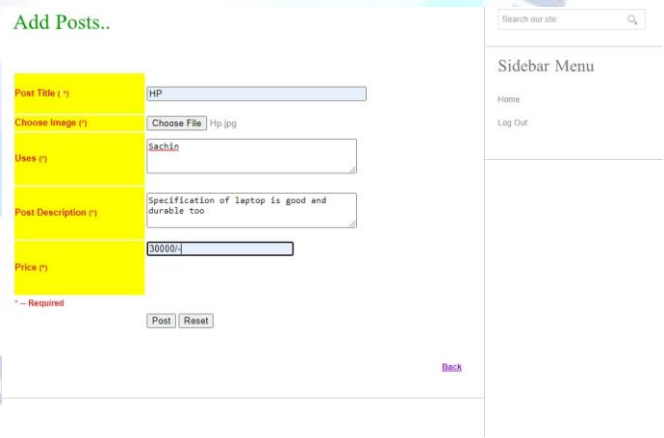



**Fig:** Adding Post by user

**SYSTEM ARCHITECTURE**

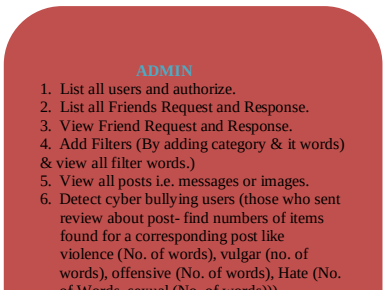



**Fig:** Posted details of user

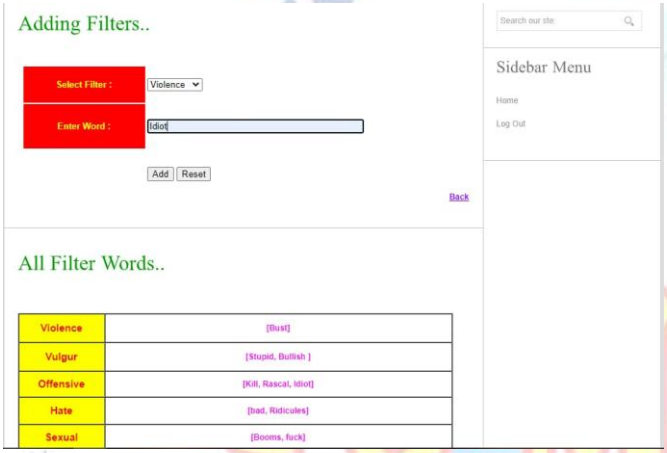



**Fig:** Filters

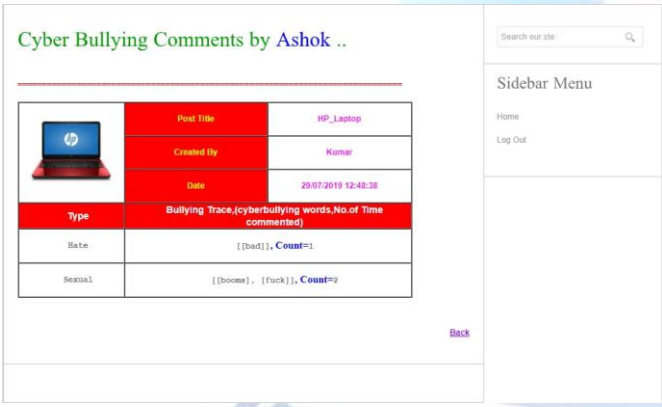



**Fig:** Bulling Comments

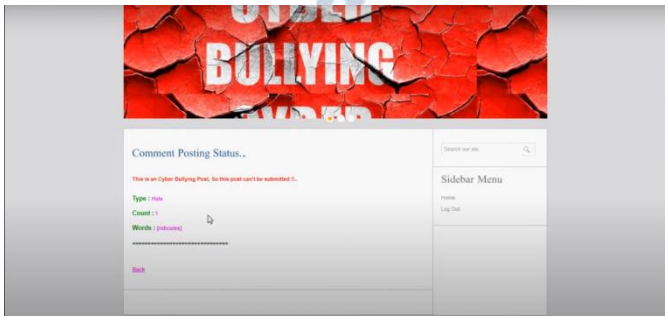



**Fig:** Bulling comment blocked with alert message


**Fig:** comment posting successful when bully word not used.


**Fig:** Cyber Bulling Details


**Fig:** review result based on bullying

## Conclusion

In this paper we focused on the problems of existing literature to detect aggressive human behaviour on social media. The main aim of our project was to detect aggressive human behaviour termed as cyberbullying in social media using machine learning algorithm in big data era. Our application will block the user comments automatically whenever it detects the bully activity. We also charecterised a list of bully words as filters, using which the application can block the bully user when they tend to use the words which match the words in filters. once the user comment has been blocked an alert message will be sent to bully

along with cyber-victim. The application also keeps the count on number of times the bully words are used .

## FUTURE WORK

The Future work aims at many different probabilities, patterns, adaptation, tests and experiments to be performed due to lack of time that can liberate various forms of cyberbullying. Cyberbullying not only exists in social media but rather there are many online platforms through various sources where we can see different forms of bullying. And we require algorithms or methods that can easily detect and stop such activity from posing a threat to human.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