

# Prevention of Cyberbullying and Online Grooming by User Profiling and Social Media Analytics

Akshay Chaudhari<sup>1</sup>, Arunesh<sup>2</sup>, Aishwarya Upadhyay<sup>3</sup>, Sarita Ghale<sup>4</sup>

<sup>1</sup> Student, Dept. of Computer Engg., Sinhgad Academy of Engineering Pune, Maharashtra, India

<sup>2</sup> Student, Dept. of Computer Engg., Sinhgad Academy of Engineering Pune, Maharashtra, India

<sup>3</sup> Student, Dept. of Computer Engg., Sinhgad Academy of Engineering Pune, Maharashtra, India

<sup>4</sup> Student, Dept. of Computer Engg., Sinhgad Academy of Engineering Pune, Maharashtra, India

## ABSTRACT

*The World has seen a rapid increase in the number of internet users. Today 3.2 billion people use the internet, a surge has been observed in the criminal activities that take place online. As people are getting more and more addicted to the use of social media platform, their instincts let them perform activities carelessly. Due to their carefree attitude, they are becoming victims of attackers who are waiting to entrap them. The primary objective is to first classify the users according to the activities they perform on the social media platforms, i.e. user profiling and then further analyze the content shared by them. Using machine learning and data mining techniques the goal is materialized. Our focus is mainly on the classification of text, social media analytics and user profiling using the data obtained from data mining henceforth blocking the user trying to attempt the unwanted act.*

**Keyword:** - User profiling, Social media analytics, Cyber-bullying, Online Grooming, Cyber security.

## 1. INTRODUCTION

Social Media in general refers to a medium of content generation, dissemination, networking amongst people motivated with similar mindsets and communication of their ideas to the fellow users. Social media certainly stands apart from the traditional broadcast media and industrial media. Social media has disrupted the way authorship and readership had been, at the same time, the process of content generation and dissemination has been following. The Social Media has evolved since the time Internet has come into its inception. Earlier the websites had their scope limited to weblogs, microblogs, online forums, wikis, podcasts, live streams, social bookmarks, Web communities, etc. but now we can observe the expanse of Social Media to Intelligent Systems and Advertisement based revenue generation businesses. In Fact, from application point of view many websites that have dedicated themselves to the world as social media include Wikipedia (collective knowledge sharing), Quora (users get to post questions or answers), Facebook (Social Networking), Twitter (microblogging and social networking) just to name a few.

According to the International Telecommunication Union, from 738 million in 2000, the users of internet has increased to 3.2 billion in 2015[1] and still counting. As we can also observe from the reports provided by the FBI U.S. Dept. of Justice in 2015 internet crime report[2] in their annual reports total cases reported in confidence fraud/ romance, Phishing/vishing/smishing/pharming and Harassment/Threats of violence sum up to 43,415 and all these cases caused total losses of \$224 million in 2015 alone.

In the same report the losses caused due to the crime committed via medium of Social Media were \$98 million. A major part of these losses account to the practice of online grooming and cyberbullying committed via the medium of social media. As visible this is an area where there is an important need to be addressed. Social media is an important part of the information sharing and generating community with its widespread and unprecedented reach to the people in all walks of life viz. politics, education, consumers, voters, customers, businessmen, children, youth, working professionals, monks, governments, etc. All these users at the same time while using the systems needs to be protected from multiple threats that are possessed online viz. Online Grooming[3], Cyberbullying[4]. Using social media analytics and intelligence[5], natural language processing and sentiment analysis[6] we can certainly achieve the goal of identifying and preventing the crime to be

committed through the social media platform.

### 1.1 Cyberbullying

Cyber-bullying is an act of harassing a person through any form of bullying which takes place online or through smartphones and tablets. Cyber bullying can happen anytime over Social networking sites, messaging apps, gaming sites and chat rooms. Cyber bullying is prevalent over the internet and most young people will experience it or see it at some time. We see that as the number of users are increasing online there's a sharp rise in the crime rate.

### 1.2 Types of cyberbullying

There are many ways of bullying someone online and for some it can take shape in more ways than one. Some of the types of cyber bullying are Harassment, Denigration, Flaming, Impersonation, Cyber Stalking, Exclusion, Outing and Trickery. Also the threatening behaviour to some netizen can be equivalent to some danger offence and its against the law in many countries like UK to use phone or internet systems to cause distress. In UK they have 1997 Harassment Act.

### 1.3 Online Grooming

Online grooming can be explained as someone online making fool out of you or making you do something forcibly you don't want to do. This mainly happens in the youngsters, which are misguided by people online and can be threatening or blackmailing on behalf of something. For such dangers parents are worried as it can cause the mental pressure on their child. Even UK government also has taken an initiative to prevent and give justice to such cases around establishing CEOP, Child Exploitation and Online Protection Centre.

## 2. PROPOSED SYSTEM

The proposed system will work as monitoring the activities of all the active users on the social media platform. The system consists of the implemented algorithms like classification algorithm for images and text using data mining techniques. These are tested and used on top of a social networking site like Facebook where the probability of Cyberbullying and online grooming cases is higher. The system (Fig.1) can be integrated into it. It works as from the very beginning of the user activities like user creation and adding the social threads to it. The system keeps track of all the posts posted by the user as well as the images uploaded by the user onto the site. Also, the system monitors the textual content everywhere like in the personal chat of a user to another user, if found to be abusive enough to be declared as threatening or online grooming case.

The classification of posts posted by the user is done into main categories like political, educational, sports-related, entertainment or history etc. The images are undergone through the Adult image detection using image processing and the text through the sentimental analysis. With the help of this, we can define the activities by the user to be normal or suspicious. And ultimately the index out of 10 is assigned to the user. If the user has index above the threshold limit he gets a warning message regarding his activities on the social site. If the user gets such warnings more than 5 times his account is blocked by the admin until the special request is made privately to the admin. This way the social network is protected from the unwanted issues.

On the other hand, the chats and personal messages by the users are also monitored in order to detect the online grooming and cyberbullying case. If the language found to be inappropriate and the semantics to be suspicious, the user gets the warning message. And in the similar fashion, his account could be blocked by the admin.

Also, one more added feature to the system is when a user uploads a picture containing any other user existing in the social site he has to take the permission of that user to upload the picture. This imparts the security to the users that no one can upload their picture to their unwillingness.

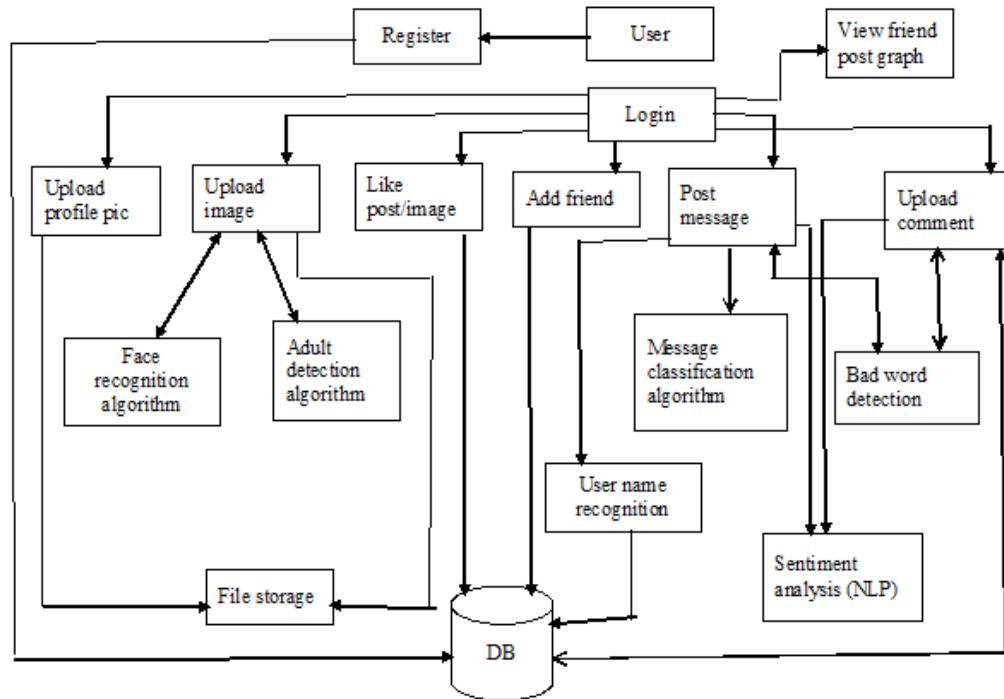


Fig -1: Architecture of the system

### 3. ALGORITHM

In our project, the data of the respective user is undergone through the various data mining algorithms discussed below in order to get the appropriate predictions for the checking of the user profile and user post eligibility for the social network. We have chosen the predictive modeling technique(Supervised Learning) in the data mining for the same. This modeling technique helps to predict the behavior of the user on the social media and to keep an eye on his upcoming posts. Here we fetch the records for the posts by the user from the database and classify them according to the mentioned categories using the classification algorithm[7]. This classification is done with the help of basic comparison technique but can be upgraded to the higher level algorithms.



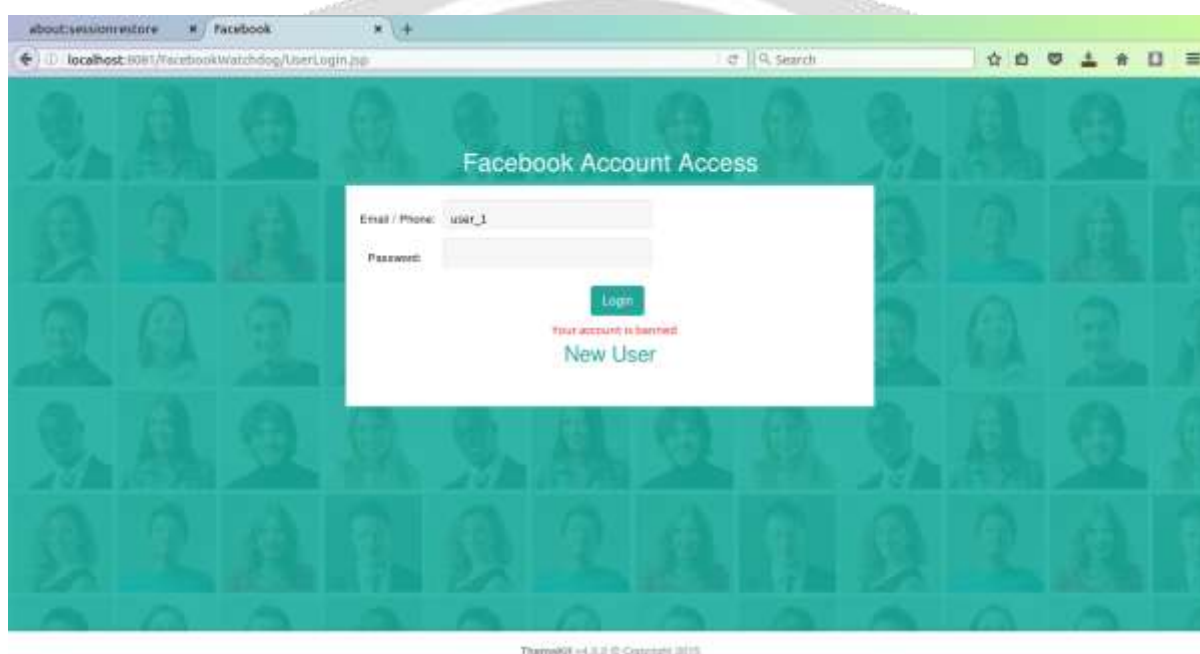
**Fig.2:** Classification of posts

The classification of the new post is made by comparing it with the dataset present on the server and the most appropriate category is assigned to the post. Now, this way database records the count for posts in each category. The user can view the Histogram (Fig.2) for classification of posts. Now, this classification helps to predict the normal behaviour or the trending changes in the system. Again validation of the post is done.

The flow of control could be specified as:

1. The user supplies the required details and registers to the portal.
2. The user then logs in.
3. The user sends friend requests to other users.
4. The user can upload images, post comments and upload profile images.
5. User posts are classified – accordingly to politics, education, entertainment, and sports.
6. Uploaded messages are classified, adult images are blocked and DB is updated.

In the same way, the user is warned every time his/her post is categorized into an inappropriate category. After exceeding the number of warnings permitted (threshold) that is 5 in our case, the user is immediately logged out of the system and his/her account is banned. When he/she tries to log in next time, account does not log in and shows that account is banned (Fig. 3).

**Fig.3:** Account Banned

#### 4. CONCLUSIONS

In this paper, we have discussed the way we can prevent cyber attacks like cyberbullying and online grooming. The attack can only be prevented by means of active protecting mechanism and timely watch over the network movements. We analyzed the social media and traced the patterns to detect the attack and working watchdog application did the rest important task to block the unfavorable accounts. This will add an extra bit to the security of the social site and improve the confidence of parents to let their child access them.

The advantages of this are to help users to browse tension free without being a victim of the attack of cyber bullying, online grooming, and cyberstalking, it is an efficient algorithm to block adult images and allow the images that are acceptable, and it'll Block the content that is not appropriate viz. Posts, messages, etc.

#### 5. ACKNOWLEDGEMENT

We are more than happy to thank Prof. S. S. Pawar and Prof. Kiran Avhad for such a valuable guidance. Also, pay our sincere thank to all those who motivated and guided us along the whole path and given us their valuable suggestions.

#### 6. REFERENCES

- [1]. International Telecommunications Union releases 2015 ICT figures,

[http://www.itu.int/net/pressoffice/press\\_releases/2015/17.aspx](http://www.itu.int/net/pressoffice/press_releases/2015/17.aspx)

[2]. U.S. Dept. of Justice Federal Bureau of Investigation Annual Internet Crime Report 2015, [https://pdf.ic3.gov/2015\\_IC3Report.pdf](https://pdf.ic3.gov/2015_IC3Report.pdf)

[3]. Whittle, Helen, Catherine Hamilton-Giachritsis, Anthony Beech, and Guy Collings. "A review of online grooming: Characteristics and concerns." *Aggression and violent behavior* 18, no. 1 (2013): 62-70.

[4]. Molluzzo, John C., and James Lawler. "A comparison of faculty and student perceptions of cyberbullying." *Information Systems Education Journal* 12, no. 2 (2014): 47.

[5]. Zeng, Daniel, Hsinchun Chen, Robert Lusch, and Shu-Hsing Li. "Social media analytics and intelligence." *IEEE Intelligent Systems* 25, no. 6 (2010): 13-16.

[6]. Understanding Sentiment Analysis by KRISTIAN BANNISTER <https://www.brandwatch.com/blog/understanding-sentiment-analysis/>

[7]. S.Neelamegam , Dr.E.Ramaraj: Classification algorithm in Data mining: An Overview, *International Journal of P2P Network Trends and Technology (IJPTT) – Volume 4 Issue 8- Sep 2013*

