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(AUTONOMOUS)

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DETECTION OF CYBERBULLYING ON SOCIAL MEDIA USING MACHINE LEARNING

UNDER THE GUIDANCE OF:

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ABSTRACT

Cyberbullying is a major problem encountered on internet that affects teenagers and also adults. It has lead to mishappenings like suicide and depression. Regulation of content on Social media platforms has become a growing need. The following study uses data from two different forms of cyberbullying, hate speech tweets from Twitter and comments based on personal attacks from Wikipedia forums to build a model based on detection of Cyberbullying in text data using Natural Language Processing and Machine learning. Three methods for Feature extraction and four classifiers are studied to outline the best approach. For Tweet data the model provides accuracies above 90% and for Wikipedia data it gives accuracies above 80%.

OBJECTIVE

The primary goal of this project is to determine the cyberbullying through social media like the offensive statements. Here we have considered the hate speech detection in social media platform and to detect this we have implemented machine learning algorithm.

EXISTING SYSTEM

In the existing system, implementation of machine learning algorithms is bit complex to build due to the lack of information about the data visualization. Mathematical calculations are used in existing system for model building this may takes the lot of time and complexity. To overcome all this, we use machine learning packages available in the scikit-learn library.

Disadvantages:

- > High complexity.
- > Time consuming.

PROPOSED METHOD

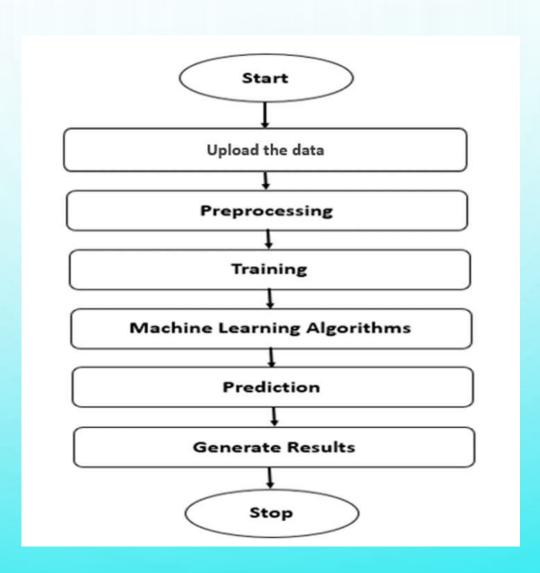
Proposed several machine learning models to classify whether the speech that we are going to classify is a hate one or not, but none have adequately addressed this misdiagnosis problem. Also, similar studies that have proposed models for evaluation of such performance classification mostly do not consider the heterogeneity and the size of the data Therefore, we propose a Natural Language Processing and Logistic Regression techniques, LSTM and CNN to predict whether it is a hate speech or not.

Advantages:

- > Highest accuracy
- > Reduces time complexity.
- > Easy to use



PROPOSED METHOD



1. LOGISTIC REGRESSION

Logistic regression is one of the most commonly used machine learning algorithms for binary classification problems, which are problems with two class values, including predictions such as "this or that," "yes or no" and "A or B."

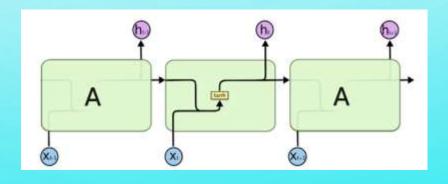
The purpose of logistic regression is to estimate the probabilities of events, including determining a relationship between features and the probabilities of particular outcomes.

One example of this is predicting if a student will pass or fail an exam when the number of hours spent studying is provided as a feature and the variables for the response has two values: pass and fail.

Accuracy of this algorithm is 94.5%

2. LSTM Networks:

Long Short Term Memory networks ,usually just called "LSTMs" – are a special kind of RNN, capable of learning long-term dependencies. They work tremendously well on a large variety of problems, and are now widely used. LSTMs are explicitly designed to avoid the long-term dependency problem. Remembering information for long periods of time is practically their default behavior, not something they struggle to learn! All recurrent neural networks have the form of a chain of repeating modules of neural network. Accuracy of this algorithm is 78.25%



3. CONVOLUTIONAL NEURAL NETWORKS

A convolutional neural network (CNN) is a type of deep learning architecture commonly used for image classification and recognition tasks. It consists of multiple layers, including convolutional layers, pooling layers, and fully connected layers. the convolutional layer applies filters to the input image to extract features, the pooling layer down samples the image to reduce computation, and the fully connected layer makes the final prediction. the network learns the optimal filters through backpropagation and gradient descent. Accuracy of this algorithm is 68.9%

4. NAÏVE BAYES CLASSIFIER:

A Naive Bayes classifier is a probabilistic machine learning model that's used for classification task. The crux of the classifier is based on the Bayes theorem.

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

Using Bayes theorem, we can find the probability of **A** happening, given that **B** has occurred. Here, **B** is the evidence and **A** is the hypothesis. The assumption made here is that the predictors/features are independent. That is presence of one particular feature does not affect the other. Hence it is called naive. Accuracy of this algorithm is 65.2%

HARDWARE AND SOFTWARE REQUIREMENTS

H/W Configuration:

Operating system : Windows 7 or 7+

RAM: 8 GB

Hard disc or SSD : More than 500 GB

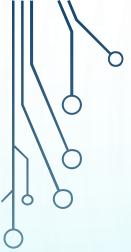
Processor : Intel 3rd generation or high or Ryzen with 8 GB Ram

S/W Configuration:

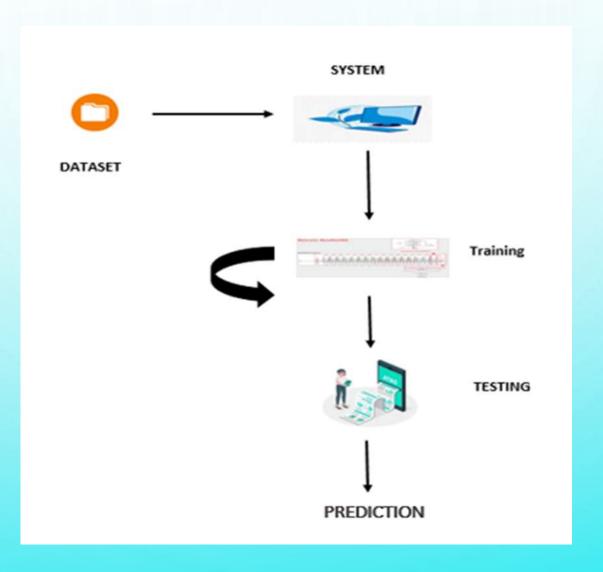
Software's : Python 3.6 or high version

IDE : PyCharm.

Framework : Flask



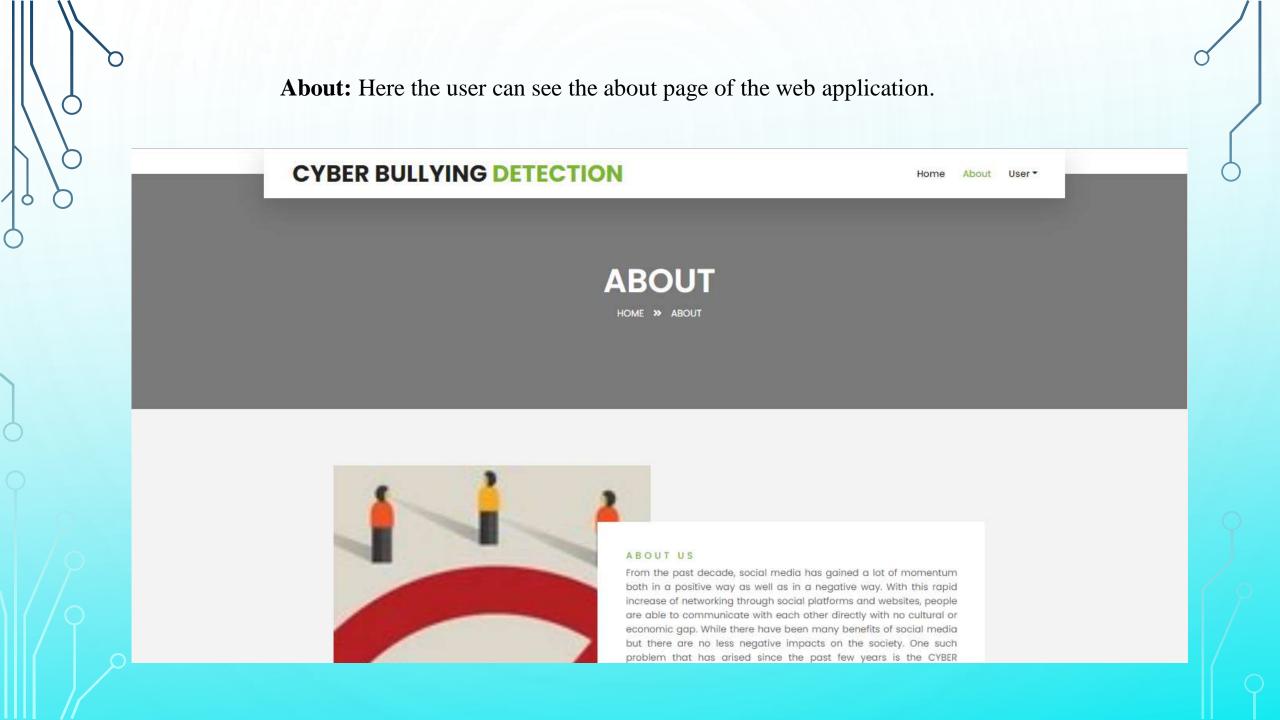
ARCHITECTURE



Output Screenshots and Results

Home: Here the user can see the home page of the web application.

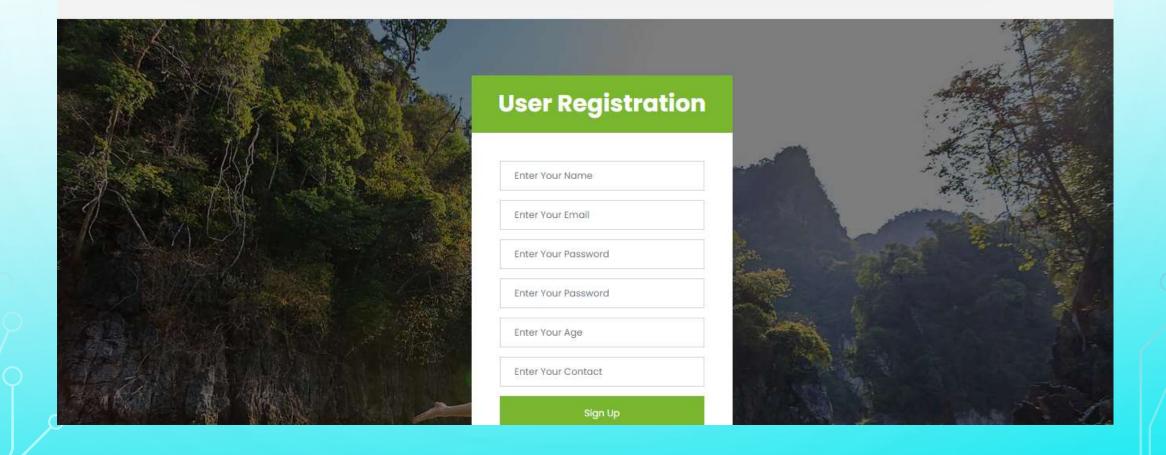




Register: Here the user can register themselves by entering their credentials in the web page.

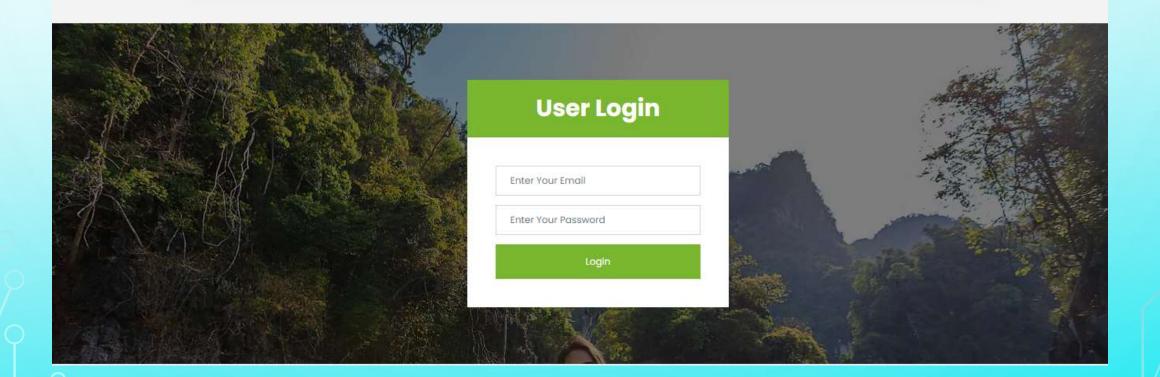
CYBER BULLYING DETECTION

ne About User



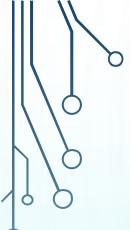
Login: Here the user can log themselves by entering their credentials in the web page.

CYBER BULLYING DETECTION



Userhome: Here the After the successful login of the user the user can enter into the user home page.





Load: Here the user can load the data for the model training and it should be csv format.

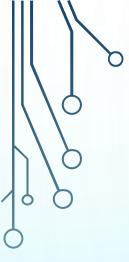


View Data: Here the user can see the dataset what we have used in this project.

CYBER BULLYING DETECTION

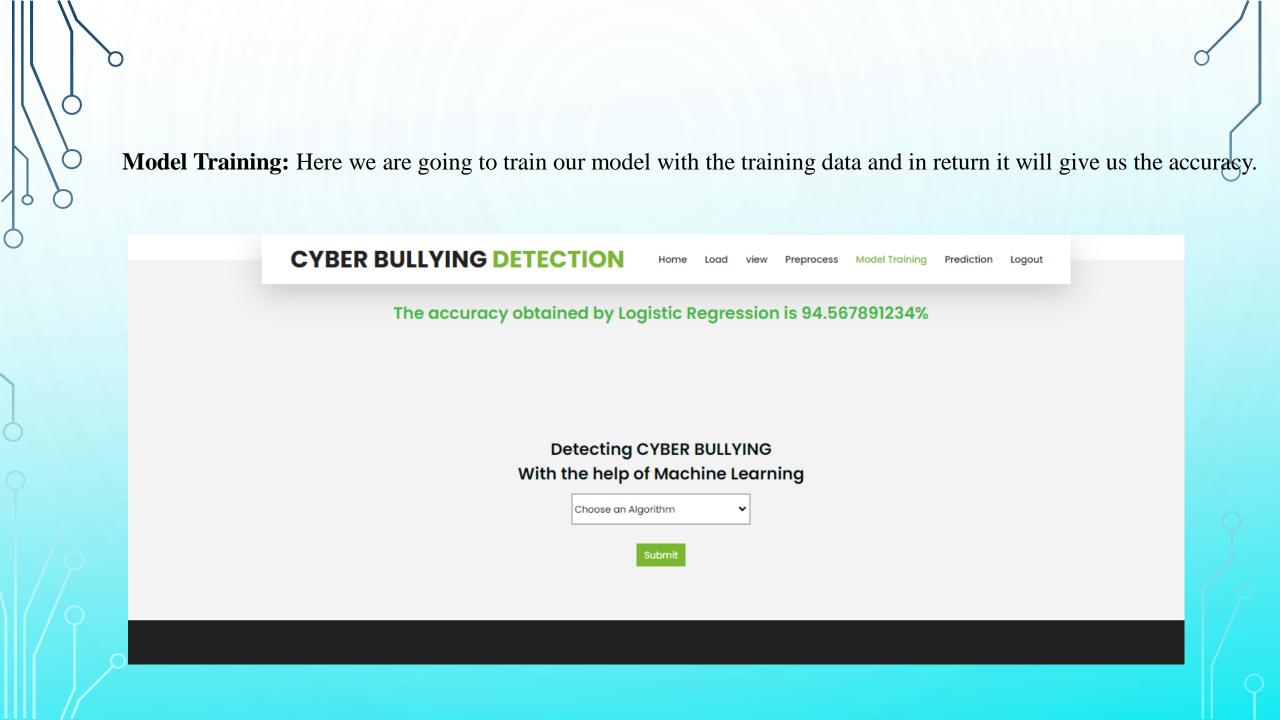
Detecting CYBER BULLYING With the help of Machine Learning

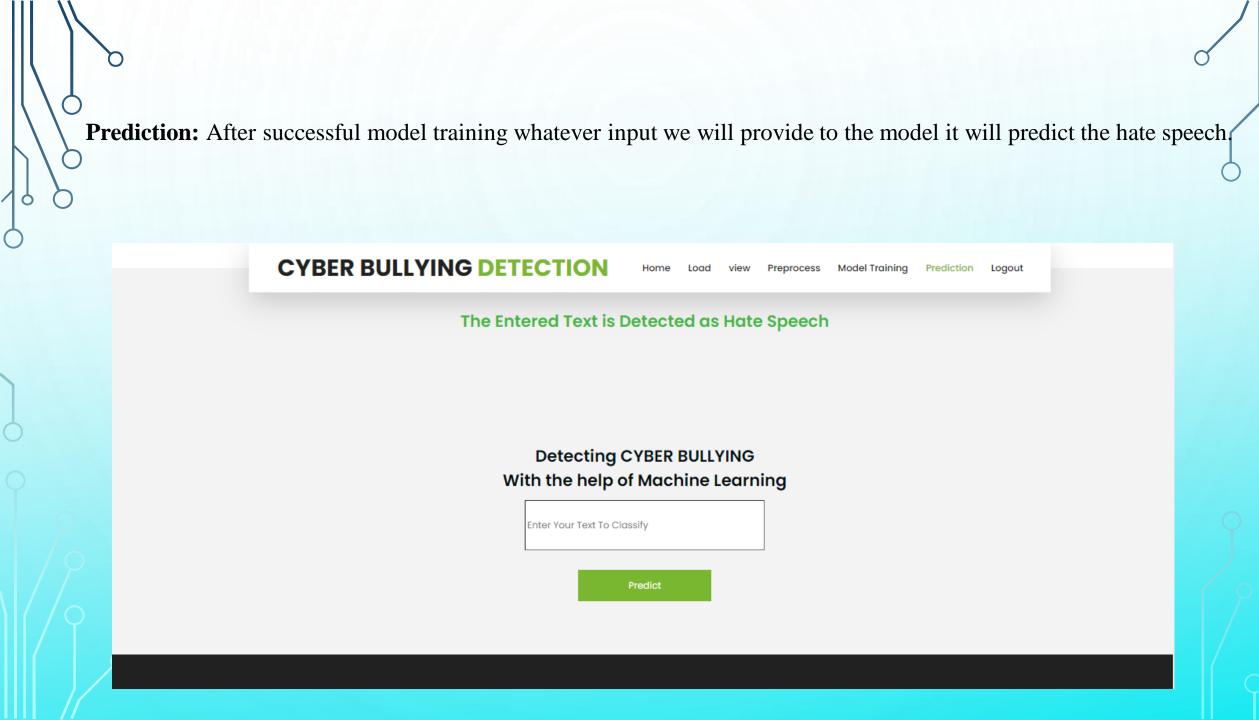
Unnamed: 0	id	text	label	type	model_wrong	db.model_preds	status	round	split	annotator
1	10000	It should be legal for a husband to rape his wife	hate	notgiven	True	0.97457	dynabench entry	1	train	gnzuctwed3
2	10001	dalits are lowlife scum	hate	notgiven	False	0.08233	dynabench entry	1	test	cagnluiznm
3	10002	dalits are lowlives	hate	notgiven	True	0.92319	dynabench entry	1	train	cagnluiznm
4	10003	It was a better world when women dare not question men	hate	notgiven	True	0.99006	dynabench entry	1	test	gnzuctwed3
5	10004	I don't work this hard so that those immigrants can take all the benefits	hate	notgiven	True	0.98836	dynabench entry	1	train	cagnluiznm
6	10005	I don't work this hard so that those migrants can take all the benefits	hate	notgiven	True	0.9950600000000001	dynabench entry	1	train	cagnluiznm
7	10006	I don't work this hard so that those foreigners can take all the benefits	hate	notgiven	True	0.9934	dynabench entry	1	train	cagnluiznm
8	10007	I don't work this hard so that those Hispanics can take all the benefits	hate	notgiven	True	0.98625	dynabench entry	1	train	cagnluiznm
9	10008	I don't work this hard so that those chavs can take all the benefits	hate	notgiven	True	0.95252	dynabench entry	1	test	cagnluiznm
10	10009	I don't work this hard so that all those pakis can take the benefits	hate	notaiven	False	N N928799999999999	dynahench entry	1	train	caanluiznm



Data Pre-processing: Here we can pre-process our data to make it noise free .

CYBER BULLYING DETECTION Home Load view Preprocess Model Training Prediction Logout Data Preprocessed and It Splits Successfully Detecting CYBER BULLYING With the help of Machine Learning Test Split Size





CONCLUSION

We made an effort to identify cyberbullying in twitter data using text classification algorithms. Though we have used various text based classification algorithms such as Long Short Term Memory (LSTM) and Convolutional Neural Network (CNN) but for future purposes, other machine learning models or practices such as Logistic Regression and even Natural Language Processing (NLP) can be used for the given dataset that we have worked on.

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