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PREDICTING CYBERBULLYING ON SOCIAL MEDIA IN THE BAG OF WORDS USING MACHINE LEARNING ALGORITHMS

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ABSTRACT: Because of the advancement of the Internet, online diversion has transformed into the most renowned strategy for partner with others in the 21st 100 years. Regardless, more one individual to another correspondence regularly truly influences society. It can provoke cyberbullying, cybercafés, electronic disparaging, online abuse, and incitement, notwithstanding different things. Cyberbullying regularly causes a lot of mental and genuine desolation, especially for young people and women, and on occasion even makes them need to end it all. Online abuse surely stands apart in light of the fact that it hurts people and society amazingly. Several the various things that have occurred actually from one side of the planet to the other because of online abuse are the sharing of private conversations, the spread of stories, and the making of sexual comments. Thusly, instructors and educators are zeroing in totally on annoying texts and posts through electronic amusement. The goal of this study is to find a viable strategy for using ML to see as impolite and pestering messages sent on the web. Four distinct ML procedures, including Nave Bayes, Decision Tree, Logistic Regression, and SVM (support Vector Machine), are had a go at using the key part, Bag-of-Words (BOW), and evaluation.

Keywords – Naive Bayes, Logistic Regression, and Support Vector Machine (SVM)

1. INTRODUCTION

Because of the advancement of the Internet, online diversion has transformed into the most well known technique for partner with others in the 21st 100 years. Anyway, more one individual to the next correspondence often genuinely influences society. It can provoke cyberbullying, cybercafés, electronic mocking, online abuse, and incitement, notwithstanding different things. Cyberbullying regularly causes a lot of mental and genuine desolation, especially for youths and women, and on occasion even makes them need to end it all. Online abuse positively stands apart in light of the fact that it hurts people and society amazingly. Two or three the various things that have occurred actually from one side of the planet to the other because of online abuse are the sharing of private conversations, the spread of stories, and the making of sexual comments. Thusly, instructors and educators are zeroing in totally on hassling texts and posts by means of electronic amusement. The goal of this study is to find a compelling strategy for using ML to see as rude and

hassling messages sent on the web. Using Bag-of-Words (BOW) and disposition assessment, four distinct ML methods are attempted to see how well they work: Support Vector Machine (SVM), Decision Tree, Logistic Regression, and Nave Bayes are approaches to taking apart data. For example, systems that usage computer based intelligence can precisely expect and perceive savaging [3]. Significant acquiring from unforgiving data can be used in enormous data study to find data that has been concealed [1]. Gigantic data assessment has helped many purposes, and when enormous data and computer based intelligence (ML) recipes are used together, it is as of now possible to predict the future [4]. To find and stop horrible approach to acting, it's imperative to look at real factors about how people act and team up start to finish and merge speculations and procedures from different locales and insightful subjects. The openness of data from an enormous number of sources gives better ways to deal with test students, better ways to deal with look for answers to fundamental mathematical requests, and better ways to deal with use data from different fields. Yet, since

of scale and precision issues, it is hard to use standard methods (legitimate techniques) in this current situation. As a rule, these systems rely upon little get-togethers who participate and share data about how people act. standard ways to deal with coinciding with people). Exactly when these redesigns are made to huge online social networks (OSNs), they cause different issues. As indicated by one point of view, the speedy advancement of OSNs gives spots and social occasions for perilous approach to acting, which makes it more grounded and more typical. Of course, OSNs give scientists critical information that they can use to make convincing approaches to finding and stop burden or exercises that could be horrible for a colossal extension. OSNs offer people who respite the law the instruments they need to mess up and give affiliations the resources they need to do similarly. Techniques that work on both the association and the substance should be used to find and stop awful lead in complex structures.

Virtual diversion locales change how people are influenced, yet they similarly support a serious kind of horrible approach to acting. Since such endless people use SM locales to speak with each other on the web, online jumbled networks like SM destinations have changed an extraordinary arrangement in the past 10 years. Online conversation has become some different option from a strategy for bantering with people you know and people you don't have even the remotest clue. It's in like manner a technique for having a few great times. In spite of the way that there are various advantageous things about virtual amusement locales, software engineers could use them to do things that are misguided or disastrous. Cyberbullying, spamming, spreading malware, and phishing are recognizable ways that people make issues and act mean on OSN objections.

2. LITERATURE REVIEW

The social amplifier - reaction of human communities to emergencies:

This overview proposes a way for a relationship to gather signs to find out about a secret state of the world. We envision that by focusing in on edges close to the point of convergence of an affiliation, slight signs could a portion of the time at any point be made more grounded, simplifying it to figure out what the secret state is. We use our game plan to track down information about disasters in remote records. We show that in endless conditions and when there is an end on the amount of edges that should be observable right away, it is more entrancing to look for egocentric social occasions around critical center concentrations than to look at disproportionate edges. The whole of the legitimate assessment, copies, and examination of a record with consider log information from a tremendous versatile provider in an European country highlight this way.

Data mining for imbalanced data sets: An overview:

In case the solicitation classes don't have commonly comparative portrayals, then, the enlightening record isn't even. Lately, there has been a lot of interest in

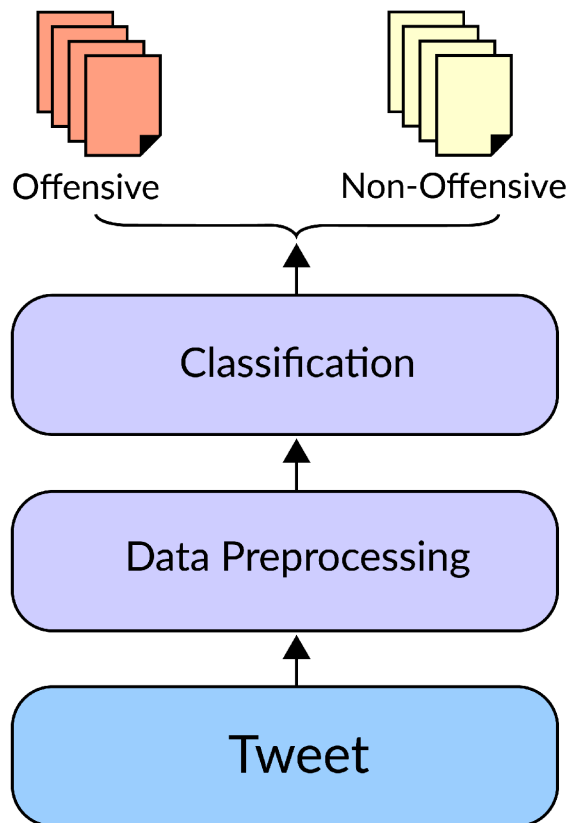


Fig.1: Example figure

using ML strategies to handle complex "certified world" issues, a critical number of which have skewed information. Furthermore, the real costs of misguided judgment presumably will not be known at the hour of learning considering the way that how information is shared for testing and organizing might be remarkable. Insightful accuracy is a commonplace technique for assessing how well a classifier capabilities, yet it may not be right when the information is separated or when the costs of committing different mistakes are very surprising. In this part, we'll look at a piece of the testing techniques that were used to change the datasets and the show values to further develop them for mining unbalanced datasets.

Improving cyber bullying detection with user context:

The awful effects of cyberbullying are falling apart reliably, yet there are at this point not very many mechanical courses of action that simplify it to answer in the right way through modified checking. So far, cyberbullying concentrate just saw individual comments and didn't consider things like client ascribes and individual data. In this review, we show how it's more clear to perceive cyberbullying when the client's setting is thought of.

Modeling the detection of textual cyber bullying:

Cyberbullying has shown up at disturbing levels as a steadily expanding number of kids say they have been badgering or seen it to others. This social bet has created because the Internet is hard to obtain and there isn't adequate consistent checking. A misfortune makes sure to have comments or posts that conversation about private or fragile subjects, which oftentimes prompts perilous results. The issue of region generally can be isolated into two additional unassuming issues: the solicitation for the text and figuring out where the fine centers are. We attempted a grouping of coordinated and multiclass classifiers on a lot of 4500 comments from YouTube. For each impression, we see that twofold classifiers are better contrasted with multiclass classifiers. Considering what we've found, we can expect that single point-

sensitive computations can be used to recognize cyberbullying on paper.

An effective approach for cyber bullying detection:

The spread of activities like cyberbullying is advanced by the speedy improvement of huge distance relaxed contact regions. A huge piece of people who participate in these activities are energetic, especially young people, who are likely going to endeavor to hurt themselves in the most incredibly horrible way possible. We advise the most effective way to use a section choice weighting method to find cyberbullying correspondences that happen through virtual unwinding. We give a sketch model for discarding the cyberbullying join, which is used to find the most unique cyberbullying tracks and dissatisfactions by gathering assessments. Tests show that our game plan is working.

Using machine learning to detect cyber bullying:

Cyberbullying is the place where someone uses advancement to be unpleasant to someone else. In spite of the way that it's been an issue for a really long time, we've actually sorted out how it affects youths. Youngsters and energetic adults who use one person to another contact regions are frail against attack where perils thrive. Using reproduced insight, we can separate between semantic models used by dangers and the people who are bothered, and we can similarly get ready laptops to see cyberbullying content in isolation. The information came from Formspring.me, a site that is easy to use and has a lot of information about bullying. The information was stepped using the Amazon Mechanical Turk web organization. We prepared a PC to see unfriendly material by using named data and AI systems from the Weka gadget set. Both a C4.5 decision tree understudy and a case based understudy found really up-sides with 78.5% accuracy.

3. METHODOLOGY

One more story says that the Massachusetts Foundation of Development will be looked at

conversely, with various spots. The's review will most likely find incitement in YouTube video comments by looking at where the text is put. The fundamental piece of organizing a declaration is figuring out whether it talks about something tricky, as sexual bearing, race/culture, knowledge level, or authentic attributes. The resulting stage is to pick a point. The overall accomplishment speed of the test was 66.7% when it came to finding continuing in YouTube comments. An support vector ML methodology was in like manner used in this undertaking.

Disadvantages:

- The framework doesn't work since it uses semi-managed ML procedures.
- The framework ought to be evaluated for abuse.

Cyberbullying is torturing that happens online through texts, messages, and online discussions. People who have been cyberbullied have expected to oversee authentic issues, like emissions of shock and implosion tries. It is an especially colossal issue by means of electronic amusement objections like Facebook and Twitter. Since harassing occurs on the web, it is all the more eagerly to recognize and stop. We thought about a technique for dealing with this issue using development that could simplify it to distinguish hassling through virtual diversion thusly. Using evaluation reviewing, we'll look for a way to deal with see and portray cases of bullying in online redirection affiliations therefore.

Advantages

- Independent ML and logistic regression course of action make the system more fruitful.
- A language based mode that concludes the course of a record considering the importance heading of words or articulations in the record is used in an electronic torture supposition model. In the text plan system, stepped text cases are used to collect ML models.

Cyberbullying assumption models are best made with a text gathering procedure that consolidates making ML classifiers from events of named text. Another decision is to use a language based model, which incorporates figuring out the heading of a text by looking at the ramifications of the words or articulations in the record.

The suggested approach has three essential advances, which are according to the accompanying: The means in the interim are preprocessing, incorporate extraction, and requesting. During the course of action step, we clean the information by discarding extra text and uproar. During the arranging stage, the going with progresses are taken:

- Symbolization: In this portion, we give the information message as individual words in an overview and as full lines or parts.

Working with text: This cuts down all of the letters in the overview of words that were taken from the tokenization, making "THIS IS Brilliant" into "THIS IS Surprising."

Word stopping and code cleaning: This is a critical piece of the dealing with cycle, where we discard stop words and encoding characters like n and t that don't give the models any supportive information.

- The second piece of the procedure being seen as The model is the strategy for getting the characteristics out. During this step, the formed information ought to be put into a report that can be used in man-made brainpower calculations. With the help of TFIDF, we start by taking out the huge bits of the information and putting them on an overview of features. TFIDF's essential idea is that it works with the message and sorts out how huge each word is equivalent to the report or announcement.

- We use evaluation assessment despite TFIDF to figure out the primary words and recollect that as a piece of the elements list, which moreover integrates TFIDF highlights. Whether a talk is

positive or negative ought to be noticeable to the farthest furthest reaches of the line. We discard the cutoff points by using the Text Mass library, which relies upon reviews of motion pictures. As well as eliminating feeling cutoff points and parts with TFIDF, the prescribed methodology uses N-Gram to portray different word mixes during model review. We were extraordinarily clear about using 2-Gram, 3-Gram, and 4-Gram.

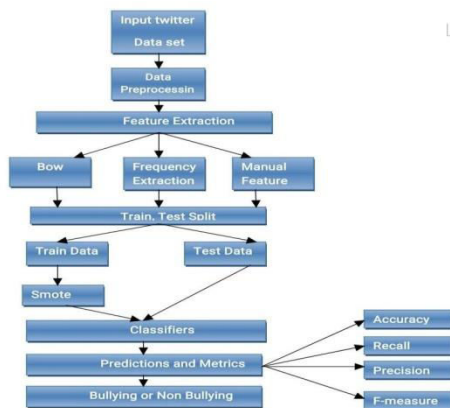


Fig.2: System architecture

4. IMPLEMENTATION

In ML, Naive Bayes A "probabilistic classifier" is a kind of classifier that utilizes Bayes' enterprise to make sound(yet credulous) surmises about the factors. They're among the least demanding ways of setting up an association.

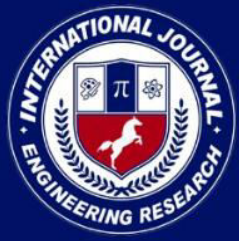
Naive bayes

Since the volume of rudiments(features or labels) in a literacy issue is connected with the volume of limits, Naive Bayes classifiers are entirely adaptable. Rather than burning through large knob of change on iterative evaluations, which are employed by a wide range of feathers of classifiers, the most probable planning should be possible fleetly by anatomizing a near design vocalization. In estimation and programming, Guileless Bayes models are also called Fundamental Bayes and Opportunity Bayes. Despite the fact that Credulous Bayes is not(truly) a Bayesian strategy, these names bandy how the enterprise of Bayes is employed in the classifier's decision rule. Gullible Bayes is a

introductory system for making classifiers, which are models that application many class imprints to give cases their class names and treat cases as vectors of element values. There's nothing system for making these models. In any case, there's a gathering of equations that are fully innovated on a analogous study Given the class variable, all innocent Bayes classifiers accept that the worth of one part is not impacted by the worth of another. exercising directed literacy, faultless Bayes classifiers can be made ahead long for certain feathers of liability models. utmost outrageous liability is employed in multitudinous realistic operations to assess the restrictions of sure Bayes models; To put it another way, the straightforward Bayes model can be taken care of without exercising any Bayesian strategies or Bayesian liability. Despite the fact that they've a harsh arrangement and make imperfect presuppositions, Credulous Bayes models have done well in a large number of testable circumstances. In 2006, a full examination of colorful characterization calculations showed that Bayes gathering is superior to different ways, like upheld trees or sporadic forestland. A check of the Bayesian arranging issue in 2004 showed, notwithstanding, that there are great academic explanations behind the appearing to be unreasonable outgrowth of artless Bayes classifiers(7). One advantage of Nave Bayes is that it just conditions a modest volume of planning data to sort out what as far as possible ought to be. It's not only one calculation; a lot of estimations all beginning with a analogous study that each arrangement of rates being deposited is special.

Decision tree

Decision Trees are a kind of controlled ML wherein the data is constantly insulated by a reasonable boundary. In this kind of literacy, you use the readiness data to sort out what the data is and what it implies. Leaves and decisionnodes can be employed to figure out the tree. Their leaves bandy the opinions and what they claimed. At the picking center points, the material is kept independent. This tree- coordinated classifier has center points that regard at the rates of the dataset, branches that



gander at the norms for simply deciding, and splint center points that gander toward the end. The decision center point and the splint center point are the two territories of a decision tree. A center for a splint has names, while a center point for a decision could have stems. A choice tree is an instrument that utilizes a tree- suchlike model of opinions and their colorful results, like the consequences of irregular occasions, the cost of coffers, and the handiness of those coffers. This shows a hand that shows that the primary is comprised of control dictions that are exorbitantly close. Choice trees are a notable fashion in AI. They're important of the time employed in undertakings exploration, particularly for disinclination examination, to help with sorting out which decision has the most egregious occasion with respects to negotiating an ideal. Every inside center point discusses a test on a characteristic, each branch discusses an experimental outgrowth, and every center point discusses a class name. The way from the root to the splint considers the principles of character. More frequently than not, places are employed to manage these. These are clear and straightforward on the grounds that they express whatever they might be allowing. After a short depiction, individualities can comprehend how a choice tree model functions. Despite the fact that there is not a lot of data, they actually have regard. At the point when specialists bandy what's going on, including its opinions, implicit issues, costs, and their perspectives for how it ought to end up, they might have the option to give us precious data. This can be employed with other dynamic ways, yet it's temperamental, and that implies that indeed a little change in the data could immensely affect how the most ideal decision tree is made. calculations can be extremely hard, particularly when there are a ton of obscure figures or a great deal of associations between the issues.

Logistic regression

One of the most naturally employed ML ways, strategic relapse is a Controlled literacy strategy. It's employed to sort out some way to prevision the straight out voluntary variable from a given arrangement of free factors. With assessed return,

foreknowing the result of a reasonable inferior variable is conceivable. therefore, the choice ought to be a reasonable or unequivocal worth. It veritably well may be Yes or No, 0 or 1, genuine or fake, etc. still, rather than giving definite figures like 0 and 1, it gives chances that are nearly near to 0 and 1. The main discrepancy between straight relapse and strategic relapse is by they way they're employed. Direct relapse can be employed to attack issues with advancement, and assessed advancement can be employed to take care of issues with gatherings. In advised relapse, we prevision the two most significant rates by fitting a "S" moldered vital capacity rather than a relapse line.(0 or 1) The essential capacity twist demonstrates the way that anything could do, analogous to whether the cells are dangerous or whether a mouse is fat in light of the quantum it gauges. crucial advancement is a notable ML fashion since it can use both ceaseless and separate datasets to make chances and portray new data. Intelligent relapse can fleetly track down the most effective ways to depict sees by exercising colorful types of data.

Support vector machine

Support vector machines(SVMs, likewise called" help vector associations") are overseen literacy models employed in ML that separate information for description and advancement examination. A SVM readiness equation is employed to make anon-probabilistic binarylinear classifier from a gathering of planning models that can be placed into one of two classes.(despite the fact that SVM can be employed with ways like Platt spanning for dubious gathering). exercising a SVM model, which shows the cases as focuses in space, there's still important room as could nicely be anticipated between the cases from colorful classes. Prior to being coordinated into a similar spot, new cases are supposed to have a place with a class in light of which side of the opening they land on. SVMs can tremendously dwindle the demand for stamped preparing cases in both normal inductive and transductive circumstances. This makes them precious for textbook and web request. Support vector machines are employed in colorful ways to

deal with frail semantics. SVMs can likewise be employed to put orders for filmland. Exploratory information shows that SVMs offer significantly further exact pursue just three or four rounds of significance input than other inquiry enhancement strategies. This is likewise valid for picture division fabrics, indeed those that application Vapnik's# 1 fashion and a changed rendition of SVM. exercising controlled SVM to assemble satellite information as SAR information. The SVM fashion is important of the time employed in wisdom and different region of the examinations. They've been employed to put proteins into accurate gatherings and tell up to 90 of the notes separated. Since there are so numerous SVM models, stage tests have been recommended as a system for sorting out what they mean.

5. EXPERIMENTAL RESULTS



Fig.3: User Interface to enter the text

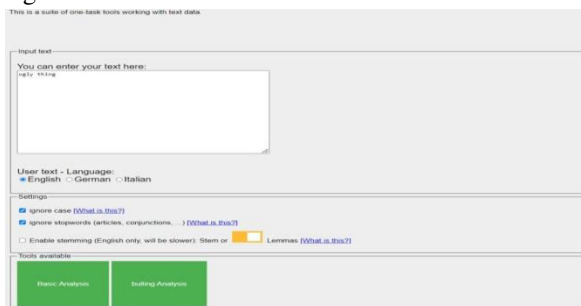


Fig.4: Entering the input

Cyber bullying Analysis

This tool analyses your plain text and tells you the most common words. This is considered the Hello World of Natural Language Processing.

Your own text

ugly thing

Main statistics:

Total characters: 10 (include spaces)

Total sentences: 1

Total tokens: 2

Unique tokens: 2

Lexical diversity: each token in average is repeated 1.0 times

Top 10 words: [('ugly', 1), ('thing', 1)]

ugly 1
thing 1

Fig.5: Basic analysis of the text

Basic Text Analyser

This tool analyses your plain text and tells you the most common words. This is considered the Hello World of Natural Language Processing.

Main statistics:

Overall Sentiment: **BULLY**

non bully Score: 0.0 (include spaces)

bully Score: 0.767

Fig.6: Bullying analysis of the text

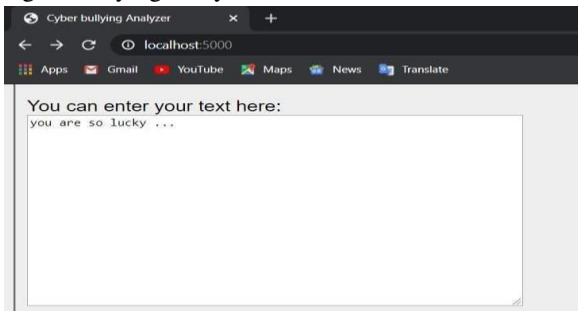


Fig.7: User input

Basic Text Analyser

This tool analyses your plain text and tells you the most common words. This is considered the Hello World of Natural Language Processing.

Main statistics:

Overall Sentiment: **NON BULLY**

non bully Score: 0.744 (include spaces)

bully Score: 0.0

Fig.8: Bullying analysis of the text

6. CONCLUSION

By working on the modified unmistakable evidence of cyberbullying in this study, we want to deal with electronic approaches to looking at present amicable conditions that could hurt mental health. We managed a technique for separating between cyberbullying that was achieved by instigation and it

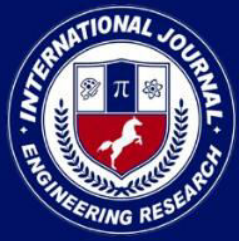
was simply horrible to cyberbullying that. This made it less huge for human very much educated specialists to comment on depleting information. In any case, we considered Participant-Language Consistency (PVC), which uses a seed set of tricky and other bugging words to figure out whether a client is an agitator or a target of baiting. Second, we showed a co-arranged outfit structure with co-arranged understudies that were not particularly noticed. One device perceives how people talk, and various ganders at how people associate with each other. Both are used to find harassers. Third, we made a ML model for looking at cyberbullying that was less uneven and relied upon a shortfall of control to keep the information from reflecting and increasing tendencies that were by then there while the model was being made. Appeared differently in relation to Nave Bayes, Decision Tree, and Logistic Regression, SVM was 77% precise. Considering our weakly controlled developing experience, we added shame based disciplines to the learning targets. Early recognizable proof of risky virtual diversion approaches to acting like incitement is supposed to find and stop the spread of hazardous online quirks. However, customized affirmation is only one of various things that ought to be fixed to totally stop cyberbullying. This study shows a critical forward-moving move toward dealing with the ability to use development to recognize cyberbullying.

7. FUTURE SCOPE

We chosen this business cause to a greater extent folk are utilizing friendly publishing and following is mastering bad, that is making population more dismal and precipitating more society to destroy themselves. Our review maybe secondhand as a beginning to raise knowledge of cyberbullying or to communicate cyberbullying separate when sticker or emojis are secondhand.

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