

# Machine Learning Text Categorization in OSN to Filter Unwanted Messages

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**Abstract**-OSN plays a vital role in day to day life. User can communicate with other user by sharing several types of contents like image, audio and video contents. Major issue in OSN(Online Social Network) is to preventing security in posting unwanted messages. Ability to have a direct control over the messages posted on user wall is not provided. Unwanted post will be directly posted on the public wall. Only the unwanted messages will be blocked not the user . To avoid this issue , BL (Black List) mechanism is proposed in this paper, which avoid undesired creators messages. BL is used to determine which user should be inserted in BL and decide when the retention of the user is finished. Machine Learning Text Categorization is also used to categorize the short text messages.

**Index Terms** -Blacklist, online social network, Machine learning text categorization, short text classification.

## I. INTRODUCTION

Most common interactive medium to communicate is online social network. several types of information or content will be shared between the users, the type of contents are audio, video, images etc. As the Amount of content will be very vast information filtering is used . OSN provide very less amount of security in posting unwanted messages. Information filtering is used for unrelated purpose. Ability of a user to automatically control the messages written on the user wall, by filtering additional communication will be termed as information filtering [1].

Machine learning text categorization technique is also used in proposed, to automatically assign the short text based on the content [3]. Techniques include some steps, short text classifier is one of the step it includes text representation, machine learning based classification, radial basis function network. Second step is of filtering rules and blacklist management. Filtering rules consists of creator specification and filtering rule .Finally, Blacklist is included. In proposed Blacklist rule is implemented. Automated system called filtered wall is evaluated, which is used to filter unwanted messages from user wall. content based message filtering is supported in proposed system which is not supported to existing system. Two level classification is performed. Short messages are categorizes as Neutral and Non neutral in first level. Neutral messages are classified in second stage. Apart from classification, powerful rule is exploited called filtering rules.

Filtering rules give the result of ML categorization process, which filter the user wall and relationship of user. Further Blacklist is also supported by the system, it can be said as users who post the unwanted message will be kept in blacklist for particular period of time. By using this rule, OSN is provided with more security. This paper is motivated by unsecure of OSN. our system ,BL mechanism used to avoid messages from undesired creators, independent from the content.

The following paper includes: Section 1 Introduction, Section 2 related works, Section 3 Existing and proposed system. Section 4 Experimental design ,section 5 conclude the paper.

## II. RELATED WORKS

Marco Vanetti, Elisabetta Binaghi, elena Ferrari, BARbara Carminati, and Moreno Carullo [1] provide the user to have a straight rule over their own wall to avoid the unwanted messages. Aim of this paper is, user have a direct control over messages posted on their own wall. So automated system called Filtered wall (FW), which have a capacity to filter unwanted message. This system will block the undesired message send by the user. Drawback of this paper is the user will not be blocked, only the message posted by the user will blocked. Content based message filtering and short text classifier support this system .To overcome the problem of this paper, Blacklist rule will be implemented as future enhancement.

L.Roy and R.J.Mooney[16] uses Collaborative filtering method, but in the proposed system content based recommendation is used. It explain a content based book recommending system that develop information extraction and machine learning algorithm for text categorization. B.Carminati, M.Vanetti, E.ferrari, M.Carullo, and E.Binaghi[8] Quality of classification is considered as the main aim. This system can usually take decision about the messages which is blocked, due to the tolerance depends on statistical data.

F.Sebastiani[3] Efficiency is good , labor power will be saved is the advantage of this paper. The main approach used here is text categorization. Comparison will be performed between human expert and labor power expert. H.Schutze, D.A.Hull, and J.O.Pedersen latent semantics indexing and feature selection used as an approach [9]. comparison of this approaches will be done. Better

performance will be taken. R.E.Schapire and Y.Singer[12] AdaBoost consist of two extension, specially planned for multi-class, multi labeled data. In first extension ,learned classifier is evaluated to predict a good approximation of sets[12].

M.Chau and L.Roy [2] Related data are very complicated to find with search engine. Location of relevant data, filtering irrelevant data are the issues. Web page is represented with content based and link based feature in proposed. Feed Forward and back propogation neural network approach is used for proposed system. Proposed approach can be applied for web content management. A.Adomavicius and G.Tuzhilin[4] Recommender system's over view is explained. Main three approach used in present generation of recommendation system are hybrid, content based and collaborative recommendation. Many restrictions of this system are elucidated. But argue to enlarge the advance system of recommender.So that this system can be used in wide variety. Extensions embrace sympathetic of users are enhanced, integrating the contextual information in recommendation method, sustain for multi criteria ranking.

B.Sriram, D.Fuhry, E.Demir, H.Ferhatosmanoglu, and M.Demirbas[5] in online services like twitter , users may grown to be plagued by the rare data. Resolution of this crisis is short text messages classification.To solve this problem , we suggest a small set of domain specific feature is haul out from user profile. This approach successfully classifies the text into generic classes.

V.Bodicev and M.Sokolova[6] classification of text enclose complex and specific terminology , need the application of learning method. Partial Matching method is applied which condense the text for confining the text feature. Partial matching develop a language model. The output of partial matching compression provides consistent precision of text classification.

J.Colbeck[7] Social network is the common interest group in web. To make the trust many explanations are required. Two level approaches are stated to combine annotation ,trust and provenance. we state an algorithm for concluding trust relationship with provenance information and trust annotation in web social network. Film trust application is introduced which uses trust to movie rating and ordering the review. we consider film trust give the good output.

M.Carullo, E.Binaghi, and I.Gallo[10] clustering of document is useful in many field. Two categories of clustering general purpose and text oriented , these both will be used for clustering of data. Novel heuristic online document clustering is anticipated , which is expert in clustering of text oriented parallel measures. Presentation measure is done in F-measure, then it will be match up with other methods. The result will indicate the power o proposed system.

## EXISTING SYSTEM AND PROPOSED SYSTEM

### A. EXISTING SYSTEM

In our Existing system , Machine Learning text categorization techniques is used, which routinely allocate with each short text message, which categories based on its content. A system called Filtered Wall (FW) is exploited, which is used to filter the unwanted messages. A

significant rule called filtering rules which is used to decide which content should be displayed on user wall. This system will not be more secure. The main problem of this paper is, it will block only the unwanted message , but the user who send that message will not be blocked.

### B. PROPOSED SYSTEM

In this paper, Blacklist mechanism is used, where the user's list will be avoided for the moment to post on user wall. This paper is the extension of previous paper, all classification and filtering rules will be included, additionally BL rule is used. Based on the user wall and relationship, the owner of the wall can block the user. This prohibition can be approved for an uncertain period of time. The technique which is used in previous paper will be explained shortly,

The techniques are,

- 1 .Short text classifiers
2. Filtration
3. Black List

#### 1. SHORT TEXT CLASSIFIERS:

Other classifier which is used in previous paper is used to classify the text which contain large amount of data, but it endure when the amount of document is little. To overcome this problem, short text classifier is used. Aim of the short text classifier is to recognize and eradicate the neutral sentences and categorize the non neutral sentences in step by step, not in single step. This classifier will be used in hierarchical strategy. The first level task will be classified with neutral and non neutral labels. The second level act as a non neutral , it will develop gradual membership. This grades will be used as succeeding phases for filtering process. Short text classifier includes text representation, machine learning based classification.

#### 2. TEXT REPRESENTATION:

Representing the text of a document is critical,which will affect the classification performance. Many features are there for representation of text ,but we judge three types of features. BOW, Document properties (DP) and contextual features. BOW and Document properties are already used in[5], are endogenous that is , text which is entirely derived from the information within the text message. Endogenous knowledge is well applicable in representation of text. It is genuine to use also exogenous knowledge in operational settings. Exogenous knowledge is termed as any source of information from outside the message but directly or indirectly communicate to the message itself. CF modeling is introduced, its feature is to understand the semantics of message. DP features are heuristically evaluated. some domain specific criteria is considered, trial and error procedures are needed for some cases. some of them are,

- Correct words : It state the amount of terms. correct words will be calculated.
- Bad words : comparison to the correct words will be evaluated. collection of dirty words will be determined.
- Capital words : It will say about the amount of words written in message. percentage of words in capital case will be calculated.

- Punctuations characters : Percentage of punctuation character over the total number of character will be calculated.
- Exclamation mark : Percentage of exclamation marks over the total number of punctuation characters will be calculated.
- Question marks : Percentage of question marks over the total number of punctuation character will be evaluated.

CFS and BOW are almost similar. The definitions which are used for CFS also will be used for BOW.

**III. MACHINE LEARNING BASED CLASSIFICATION:**

It is said that short text classifier include hierarchical two level classification process. First level classifier execute a binary hard categorization that label message as neutral and non neutral. The first level filtering task assist the succeeding second level task in which a finer grained classification is done. The second level classifier will do the soft partition of non neutral messages. Among the variety of models, RBFN model is selected. RBFN contain a single hidden layer of processing units. Commonly used function is Gaussian function. Classification function is non linear, which is the advantage of RBFN. Potential over training sensitivity and potential sensitivity to input parameters are the drawbacks.

**ARCHITECTURE OF PROPOSED SYSTEM:**

Architecture of the proposed system includes filtering rules and blacklist. The whole process will be visible clearly in Architecture. Message will be labeled based on the content, so classification will be over. Then the filtration part, which is done by filtering rules. Analysis of Creating the specification will be done. Finally probability value is calculated and the user who post the unwanted message will be kept in Blacklist. So that the user will be temporarily blocked. Advantage of our proposed System is to have a direct control over the user wall.

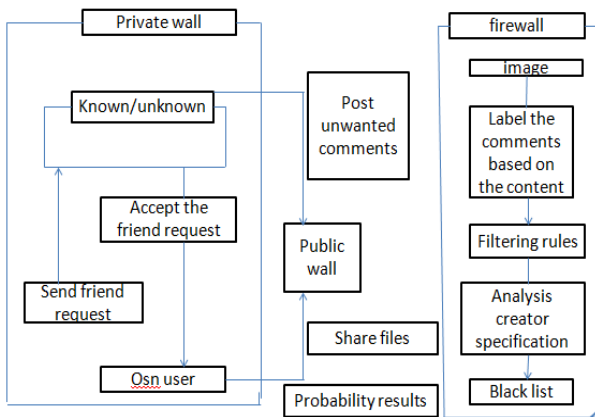


Fig :1 Architecture diagram

**FILTERING RULES:**

To define the language for FR specification ,many issues are considered. First issue may be the message with different meaning and significance based on who writes it.

As a result, FR should allow the user to restrict the message creators. Here the type, depth, and trust value are recognized by creator Specification.

**DEFINITION1**(Creator specification) A Creator Specification CreaSpec, which denotes a set of OSN users. Possible combinations are

- 1.Set of attributes in the An OP Av form,where An is a user profile attribute name, Av is profile attribute value and OP is a comparison
2. Set of relationship of the form (n, Rt, minDepth, maxTrust) indicate OSN users participating with user n in a relationship of type Rt, depth greater than or equal to minDepth, trust value greater than or equal to maxTrust.

**DEFINITION 2** (Filtering rule) A filtering rule is a tuple ( auth,CreaSpec,ConSpec,action)

1. auth is the user who state the rule.
- 2.CreaSpec is the Creator specification.
- 3.ConSpec is a boolean expression.
4. action is the action performed by the system.

Filtering rules will be applied ,when a user profile does not hold value for attributes submitted by a FR. This type of situation will dealt with asking the owner to choose whether to block or notify the messages initiating from the profile which does not match with the wall owners FRs, due to missing of attributes.

**BLACKLIST :**

The main implementation of our paper is to execute the Blacklist Mechanism, which will keep away messages from undesired creators. BL are handled undeviating by the system. This will able to decide the users to be inserted in the blacklist. And it also decide the user preservation in the BL will get over. Set of rules are applied to improve the stiffness , such rules are called BL rules.

By applying the BL rule ,owner can identify which user should be blocked based on the relationship in OSN and the user's profile. The user may have bad opinion about the users can be banned for an uncertain time period. we have two information based on bad attitude of user. Two principle are stated. first one is within a given time period user will be inserted in BL for numerous times, he /she must be worthy for staying in BL for another sometime.

This principle will be applied to user who inserted in BL atleast once. Relative Frequency is used to find out the system ,who messages continue to fail the FR. Two measures can be calculated globally and locally, which will consider only the message in local and in global it will consider all the OSN users walls.

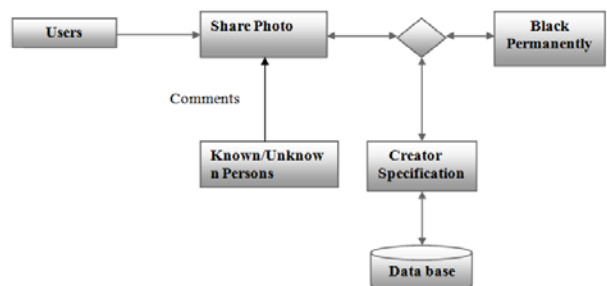


FIG 2: blacklist system

**DEFINITION 3** (BL rule) BL rule is a tuple (auth,CreaSpec,CreaB,t),where

- auth is a user who state the rule.
- CreaSpec is a creator specification.
- CreaB have two components ,RF Blocked and minBanned

RFBlocked=(RF,mode>window) such that

$RF = \frac{*bMessages}{*tMessages}$

where \*tMessage is the total number of messages that OSN user recognized using CreaSpec,

whereas \*bMessage is the number of message in \*tMessage that have been blocked.

window represent the time interval of message creation.

minBanned= (min,mode>window)

min is the minimum number of times in the time interval enumerate in window that OSN user recognized using CreaSpec .mode indicates all OSN user .

- T signify the time period the user recognized by CreaSpec and CreaB which will be banned from auth wall.

**IV. EXPERIMENTAL DESIGN**

Experimental design of the system include the entire data flow of our system. User once post the message , Labels are classified based on the content. then the message will be filtered . Probability of the message will be evaluated. Based on that value the user will decide whether to insert in BL or not,

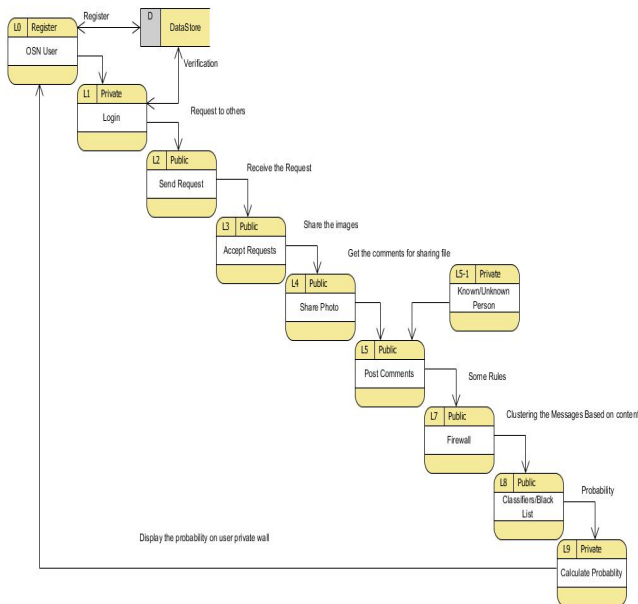


FIG 3: Experimental diagram

**V. CONCLUSION**

In this paper, a system to filter unwanted message in OSN wall is presented. The first step of the project is to classify the content using several rule. Next step is to filter the undesired rules. Finally Blacklist rule is implemented. so that owner of the user can insert the user who post undesired messages. Better privacy is given to the OSN wall using our system. In future Work, we plan to implement the filtering rules with the aim of bypassing the filtering system, it can be used only for the purpose of overcome the filtering system.

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