Characterizing and Countering Communal and Anti-Communal Tweets During Disasters

Archana K. S, Latha M, Sheela Gowr P

Abstract: Various tweets shared during a disaster situation encompasses data related to current scenario and about emotions/opinions. By analyzing these communal tweets, abusive posts which targets various religious and racial groups during natural calamities has been found. By reviewing its effects, a classifier has been developed to distinguish between communal and non-communal messages, which shows better performance. People posting such communal tweets has been analyzed which says that most of them are posted by popular users from media, politics and form strong correlated groups in the social network which makes it to reach higher. An event-independent classifier has been proposed which identifies anti-communal tweets automatically and propose a way to counter back. A real-time service has been developed to find tweets automatically related to an emergency segregating communal and anti-communal tweets. Government and local monitoring agencies can use this system for making decisions like filtering or to promote some news.

Keywords: Tweets, Communal, Non-Communal, Event-Independent classifier.

I. INTRODUCTION:

Communal tweets were analyzed during disaster situations which identifies the messages along with the users and it helps to counter that information. Offensive messages are getting shared at the time of terrorist attacks. For example, Burnap et al., have focused about the religious community which got noticed during Woolwich [1]. In few geographical regions including Indian subcontinent, they are being shared when floods and earthquakes occur. Such tweets develop hatred among common people, resulting in loss of communal harmony, causing problem in law and order situation. Even the government feels difficult to handle such situation during disasters [1,5].

II. LITERATURE SURVEY:

In 2013 Drummer Lee Rigby in Woolwich got murdered which gave wide retroaction on social media. In Rigby's murder twitter data was collected which used a text classifier based on machine learning that helped to find messages related to race, ethnicity, or religion.

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* Correspondence Author

Archana K. S, UG student, Department of computer science and Engineering Vels Institute of science, Technology and Advanced Studies, Tamil Nadu, India.

Latha M, Assistant Professor Department of computer science and Engineering Vels Institute of science, Technology and Advanced Studies, Tamil Nadu, India.

Sheela Gowr P, Assistant Professor Department of computer science and Engineering Vels Institute of science, Technology and Advanced Studies, Tamil Nadu, India.

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Form the content available, the features for classification were extracted including grammatical dependencies between words. Statistical model is used to show the Optimal results obtained by probabilistic classifiers to predict the spread of cyber hate in Twitter [2,8]. Various issues which used Twitter to track racist language was selected and its Geography of Hate Map showing the ability to track racism was seen. They collected racist language on Twitter via different methods and its data collection process along with its challenges has been provided. It highlighted why Twitter has become a vital data collection tool for researchers whose interest focused in racism [3,6].

III. EXISTING SYSTEM:

Various studies identified online contents like speeches that are hate or offensive in nature. A supervised BOW model helped to classify those contents which includes words, features with respect to context are also incorporated for high classification accuracy. Obscenities, profanities were used to find offensive content in YouTube forums. Dinakar et al., identified cyberbullying via tags, discussions with negative meanings. In recent times, Williams et al., have discussed about model based on features which helped to find danger speeches that are shared at the time of disaster happening [4,7].

IV. PROPOSED WORK:

Communal tweets analysis during disaster situations was done. Communal tweets were identified along with users initializing or encouraging such messages, and counter them with anti-communal posts instructing people to avoid communal venom. Low-level lexical features were used by a classifier for extracting communal messages [4]. Two categories were specified: 1) originators 2) propagators. Here in addition to retweets the similarity between tweets, timestamps identifying initiators and propagators were identified more accurately performing analysis on these groups of users. Identified users with their patterns was extracted to learn the events happening with their phenomena. Rule-based classifier has been proposed which helps to neutralize the effect. A real time system Dis Com has been developed which automatically identifies the communal and anti-communal tweets during emergency situations.

V. IMPLEMENTATION:

The proposed model has the following modules and module description has been explained below.

1. Authentication
2. Data Collection
3. Pre-processing
4. Communal Tweets Identification
5. Anti-Communal Tweets Identification
6. Communal User Identification
7. Performance Analysis

Authentication:

This module belongs to both admin and User. Admin can login with his available details and the User needs to register by providing the details and can login with the details. If both matches, then the valid user can proceed further.

DataCollection:

Twitter dataset has been collected based on the Disaster Events like Syria war, PA attack(Coordinated terrorist attack in Paris). This dataset contains tweets of the different people belonging to communal and non-communal tweets. By uploading the dataset, the communal and non-communal tweets can be classified from the dataset.

Preprocessing:

In this step, admin can view the uploaded dataset and it should be preprocessed. Here stop-words and stemming techniques have been used. Tweets may contain url, tags(@user), irrelevant content(???) and these unwanted contents should be removed. which includes removal ofURLs, Tags and irrelevant expressions. Now the stop-words technique is used to remove the unwanted data like is, this, and, a, at, the etc. from the tweet.

1) Stopwords Removal:

A stopword list which holds 75 stopwords has been used. The target text stores individual words as an array while reading a single word from the list. It is matched without output text as an array via sequential search technique. If a match is found, the word gets removed from the array while continuing the comparison till the end. After completion of one stopword, next one gets read from the list and algorithm runs till the end. Output displays the text without stopwords, number of stopwords removed, total words in target text.

2) Stemming Technique:

After removing the unwanted words from the tweet, stemming technique is processed. Reducing derived words to its stem is done in this process. Its root form will be in a written word form. There is no need that the stem and the morphological root of the word to be equal; it is enough that correlated words map to the same stem, even if its not in a valid root.

Communal Tweets Identification:

After preprocessing, classification of communal and non-communal tweets has been done. To classify the tweets, Rule based algorithm is implemented along with the SVM Algorithm[9].

Anti-Communal Identification:

After the classification of tweets, analysis of non-communal tweets reveals that few users post anti-communal messageshoping to stop people from sharing communal contents. Hence communal tweets can be countered back by promoting such anti communal content[10].

Communal User Identification:

Once communal tweets are found, finding its nature and user is essential. Two categories of users have been identified.

1. Initiators 2. Propagators

Initiators: People Initiating communal tweets.

Propagators: People who retweet communal tweets / copy them and post like their own tweet with few modifications.

Performance Analysis:

Finally, Performance has been analyzed and found out following Parameters

- i) Precision Value
- ii) Recall Value
- iii) F1 Measure
- iv) Accuracy.

The various outputs have been shown below.

Fig. 5.1 MAIN PAGE

Registration

Username	<input type="text" value="Enter Your name"/>
Password	<input type="password" value="Password"/>
Mobile	<input type="text" value="Mobile"/>
Email	<input type="text" value="E-Mail"/>
D.O.B	<input type="text" value="dd-mm-yyyy"/>
Language	<input type="text" value="Language"/>
Country	<input type="text" value="Country"/>
State	<input type="text" value="State"/>
City	<input type="text" value="City"/>
<input type="button" value="Register"/>	

Fig 5.2 LOGIN FOR USER

Fig 5.3 RETWEETS

User Identification Output

ID	User_name	Date	Tweets	Date	Time	User Identification
3	pryanka	chennai	hills/madras	2018-09-19	04:23 PM	initiator
1	moni	chennai	hills/madras	2018-09-19	04:23 PM	propagator
4	ari	CHENNAI	hills/madras	2018-03-28	01:10 PM	propagator

Fig 5.4 USER IDENTIFICATION

ID	User_name	Date	Tweets
1	SameeraKhan	12/31/2015 6:30	RT @BenjaminNorton: This Was One Of The Intended Effects Of The International War
2	lwax86	12/31/2015 7:02	RT @SyrianWarDaily: Syrian War Daily 8th August 2018 #Syria
3	Lelya_Kaktotak	12/31/2015 8:39	#Syria: Damascus Embassy Behind The Deals
4	JettGoldsmith	12/31/2015 8:54	RT @SyriaCivilDef: The #WhiteHelmets Teams Helped Open The New Cultural Center I
5	spanishrefugee	12/31/2015 8:56	RT @enich0505 @Bitch8491 @BuzBuz ifamericansknew Jews masters authorities USA use
6	mechaniMa	12/31/2015 13:29	RT SyriaCivilDef WhiteHelmets teams helped open new Cultural Center Idlib City venue honour Syria's heritage
7	elic101	12/31/2015 21:42	Neo-Liberals didnt give sh/t @Obama@Clinton/Bush/BClinton dont give crap Trump
8	dudeofrock	12/31/2015 22:25	RT maytham956 almost 8 years war one think got immune certain feel wrong First Lady Syria
9	chico_hawk	12/31/2015 22:33	RT @Crimesofbrits: Britain currently waging war Afghanistan Iraq Libya Somalia Syria & Yemen Rarely ever news

Fig 5.5 DATASET

Classification

ID	User_name	Date	Tweets
1	SameeraKhan	12/31/2015 6:30	RT @BenjaminNorton: This Was One Of The Intended Effects Of The International War
2	lwax86	12/31/2015 7:02	RT SyrianWarDaily Syrian War Daily 8th August 2018 Syria
3	Lelya_Kaktotak	12/31/2015 8:39	Syria Damascus embassy behind deals
4	JettGoldsmith	12/31/2015 8:54	RT SyriaCivilDef WhiteHelmets teams helped open new Cultural Center Idlib City venue honour Syria's heritage
5	spanishrefugee	12/31/2015 8:56	RT enich0505 @Bitch8491 @BuzBuz ifamericansknew Jews masters authorities USA use army dirty bandit
6	mechaniMa	12/31/2015 13:29	RT SyriaCivilDef WhiteHelmets teams helped open new Cultural Center Idlib City venue honour Syria's heritage
7	elic101	12/31/2015 21:42	Neo-Liberals didnt give sh/t @Obama@Clinton/Bush/BClinton dont give crap Trump
8	dudeofrock	12/31/2015 22:25	RT maytham956 almost 8 years war one think got immune certain feel wrong First Lady Syria
9	chico_hawk	12/31/2015 22:33	RT crimesofbrits Britain currently waging war Afghanistan Iraq Libya Somalia Syria & Yemen Rarely ever news

Fig 5.6 PREPROCESSING DATASET

Classified Output

ID	User_name	Date	Tweets	Status
1	SameeraKhan	12/31/2015 6:30	RT @BenjaminNorton: This Was One Of The Intended Effects Of The International War Syria US UK Saudi Arabia Turkey Qatar	communal
2	lwax86	12/31/2015 7:02	RT SyrianWarDaily Syrian War Daily 8th August 2018 Syria	communal
3	Lelya_Kaktotak	12/31/2015 8:39	Syria Damascus embassy behind deals	communal
4	JettGoldsmith	12/31/2015 8:54	RT SyriaCivilDef WhiteHelmets teams helped open new Cultural Center Idlib City venue honour Syria's heritage	Non communal
5	spanishrefugee	12/31/2015 8:56	RT enich0505 @Bitch8491 @BuzBuz ifamericansknew Jews masters authorities USA use army dirty bandit	Non communal
6	mechaniMa	12/31/2015 13:29	RT SyriaCivilDef WhiteHelmets teams helped open new Cultural Center Idlib City venue honour Syria's heritage	Non communal
7	elic101	12/31/2015 21:42	Neo-Liberals didnt give sh/t @Obama@Clinton/Bush/BClinton dont give crap Trump	communal
8	dudeofrock	12/31/2015 22:25	RT maytham956 almost 8 years war one think got immune certain feel wrong First Lady Syria	communal
9	chico_hawk	12/31/2015 22:33	RT crimesofbrits Britain currently waging war Afghanistan Iraq Libya Somalia Syria & Yemen	communal

Fig 5.7 COMMUNAL AND NON-COMMUNAL TWEETS

Table 5.1 shows the performance measures for identifying tweets with corresponding values. Event dependent and event independent classifier outputs has been shown with values. The proposed classifier works for event independent showing better accuracy rate and the comparison chart has been shown below.

Fig 5.8 Comparison between classifiers

Table 4.1 Performance analysis of LDA

Classifier	Precision	Recall	F1 Measure	Accuracy
Baseline models (Event dependent)	0.846	0.385	0.463	0.55
LDA (Event independent)	1.0	0.416	0.587	1.228

VI. CONCLUSION

Characterizing communal tweets during disaster and analysing its users involved has been a big issue. The event-independent classifier that filters out communal tweets and retweeted messages heavily which are posted by popular users has been developed. Various users initiate and promote communal contents and create a group. Also, there are users who get angry because of such happenings and start to show their hate towards specific religious communities involved.

During disaster, few users also post anti-communal content saying to stop sharing communal posts, providing the necessity to reduce the effects of such tweets. The proposed classifier identifies such anti-communal tweets and the proposed system helps to differentiate tweets during disaster events.

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AUTHORS PROFILE:

M.Latha, Assistant Professor, Department of Computer Science and Engineering, Vels Institute of Science , Technology and advanced Studies, Chennai, India. Area of Research : Medical Imaging

P.Sheela Gowr, Assistant Professor, Department of Computer Science and Engineering, Vels Institute of Science , Technology and advanced Studies, Chennai, India. Area of Research : Cloud Computing and Networking.