Emergency Alert for Disaster Management using Big Data Analytics

Indhuja M
Department of Information Technology
Jerusalem college of Engineering, Pallikaranai, Chennai

Keerthika G
Department of Information Technology
Jerusalem college of Engineering, Pallikaranai, Chennai

Lilly Sheeba S
Department of Information Technology
Jerusalem college of Engineering, Pallikaranai, Chennai

Abstract

In recent days people are interested in using social network applications in smart phones. Text messaging consumes less network resources than voice or wireless broadband. In this paper we propose an emergency alert response system. In reality, there is no proper alert system in place to report disaster related events and hence there is no way for immediate rescue. In our proposed system, we have implemented an emergency alert for disaster management using Big Data analytics by using tweets posted by users on the social networks. Here an emergency alert will be sent to appropriate people and disaster related keywords are used to identify the specific location of the worst hit area due to disaster. This can enable the rescue team to focus on the worst hit areas.

Keywords: Twitter, individual preference, interpersonal preference, location estimation, particle filter, tweets

I. INTRODUCTION

Initially, database management concepts were used to handle and extract useful information from large volumes of data over network which helps the higher authority in making decisions and thereby to enhance their way of incurring profit from the particular product they had developed. But, nowadays with growth in size of population leads to growth in large volume of data generated by social networks which are used by people in day to day life, it is difficult for the existing database management system to handle large volumes of data. Big data provides an apt solution.

Big Data is nothing but an assortment of huge and complex data that becomes very difficult to capture, store, process, retrieve and analyse. Moreover it can coordinate with on-hand database management tools or traditional data processing techniques. Big Data is widely applied in the field of asset maintenance, finance management, social network based application, improving security and law enforcement, optimizing machine and performance.

The characteristics of Big Data includes volume of data, large velocity of data, various types of data (mostly multimedia data) and utility of data. With time, data volume is growing exponentially. Earlier we measured size in terms of Megabytes or Gigabytes, but now it is measured in terms of Terabytes, Peta bytes, Zeta bytes. Velocity is the speed at which data arrives from various resources. Variety is the type of data used such as images, audio, video, sensor data and log files. Reviews posted by friends or neighbours about the disaster which is ongoing will be useful to provide immediate support to hit areas by tracking location using particle filter.

II. RELATED WORK

Detection of Adult account is performed using different types of techniques such as text based, image based, URL blacklisting [1], [10]. URL blacklisting is one of common content filtering which can detect 17 percent of adult account, URL blacklisting is not much effective due to fast growing adult content in social blogs, text based detection can detect 42 percent of adult account.

For detecting adult account an alternative solution is graph based classification which classifies notes based on relationship between twitter and entities in tweets. Since graph based classification are built on pair wise similarity it cannot work effectively on link entity graph [2-7]. In order to overcome this difficulty we proposed an effective classification algorithm called iterative social base classifier. Trust Rank algorithm is used to detect spamming accounts based on relationship between entities in tweets [8].

Twitter is considered as Micro Blogging service which can send images or audio clips. It provides integration of semantic analysis and real time nature of twitter. Twitter is used for earthquake prediction and early warning. It exposes an innovative social approach which has not been reported in early days.

They have used sensors for detecting earthquake. The tweet of earthquake is detected within a minute and an e-mail is sent to the Meteorological Department as well as to rescue team. Re tweet activity is investigated by some researches to check content

posted by the users many twitter application such as Tweet-tronics provide analysis of tweets related to positive and negative tweets[9] [11] [12].

Content-based filtering and collaborative filtering are commonly used to help users to find out valuable information. Content-based filtering provides idea of working on individual patterns, but this approach is not able to learn user behaviour patterns from user [13]. Collaborative filtering method consists of memory and model based methods. Utilizes user interaction information, but not able to differentiate social relations. Individual preference and inter personal preference are considered for social recommendation [14] [15].

III. PROPOSED SYSTEM

In existing system collaborative filtering considered social relations but did not include contextual factors. An algorithm has been proposed to monitor tweets, detect hit areas and to identify location using particle filter.

An application will be created using JSP. Design fields such as user name, password and phone number will be given by user. The server validates user information and allows user to tweet through web application. Particle filter is used to extract the keyword such as flooding, earthquake or shaking and also to find the location of affected area.

Stemming algorithm is used to remove unwanted words from tweets posted by friends or colleagues. Web Application is created with Easy interface and disaster related keywords are added by Administrator which has been stored in application server and also content posted by user will reach application server which act as easy interface. Each time when tweets are posted it compared with the words stored in database, stemming algorithm removes unwanted words which are not related to disaster. If keywords match with database, an emergency alert is sent to nearby people as well to rescue team. The overall architecture of the proposed system is specified in Fig.1.

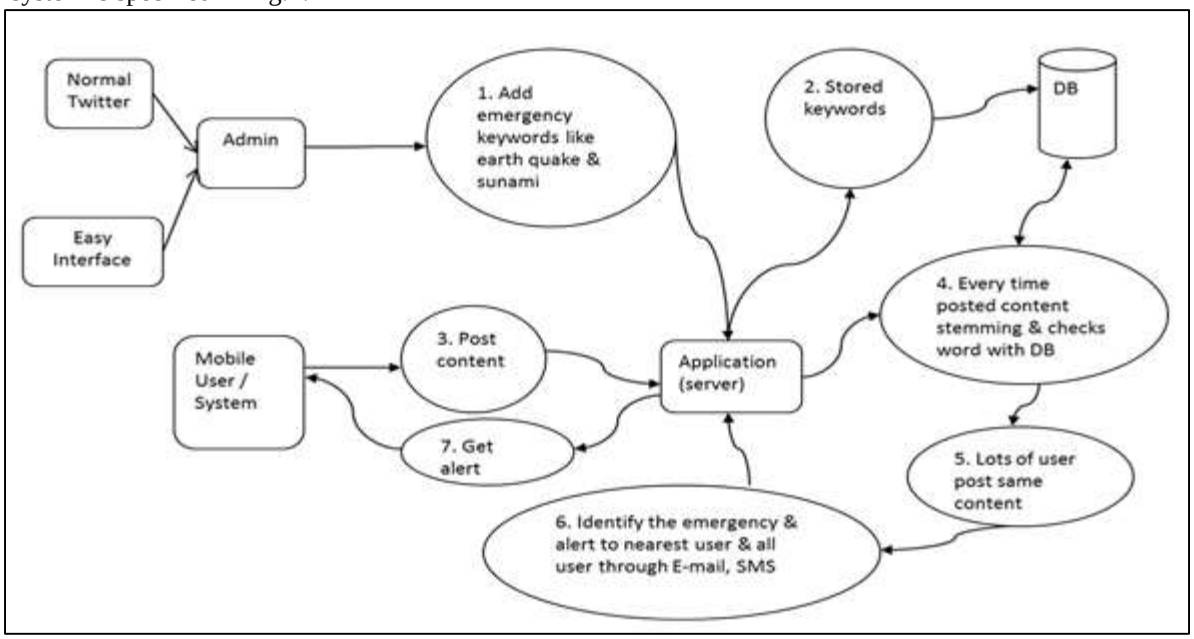

Fig. 1: Architecture for Emergency Alert

IV. CONCLUSION

In this paper, we have proposed a system which provides immediate support to people of worst hit areas by tracing the location that has been worst affected due to some disaster using particle filtering. For tracking the location of worst hit areas we trace down the tweets posted by affected persons in social networks time to time. Threshold values are fixed and hence repetitive tweets from same users cannot divert and distract the rescue team.

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