Detection of Fake Online Reviews Using Semi Supervised and Supervised Learning

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ABSTRACT

In current days sentiment analysis is the domain which gained a lot of user's attention towards it in gaining the users interest for taking any decision or purchase. The term sentiment is nothing but feedback or opinion about an product or post which is posted on the online web. As we all know that almost all users are mostly concentrated about online reviews for taking decision about new purchases or to follow any new trend, a lot of web sites are providing fake reviews by manipulating the product reviews based on his/her interest. This current paper try to develop new methods like semi-supervised and supervised text mining models in order to extract the features from online reviews and detect the fake online reviews based on the movies dataset. Here we attempt to apply the supervised learning on movies dataset, during which the admin attempt to collect a group of latest movies information and this may be viewed and rated by the top users. The user can able to give reviews based on multiple parameters like: Rate by Movie, Rate by Religion, Rate by the star ratings and lot more. Here we try to identify all the interesting movies as well as un-interesting movies from the set of movie reviews and try to give the detailed analysis for the end users who try to search about that movie.

Key Words: Semi-Supervised Learning, Supervised Learning, Fake Users, Interesting Movies, Text Mining.

1. INTRODUCTION

In current days the advent of innovation and the Internet have changed a lot and it attracted a lot of users towards them. Due to these two things people try to adopt for internet for surfing and accessing the information which they really like. In general the users try to hare the common updates from one location to another location by using a social media. One among the best in every of several OSN networks is facebook which is the main source for communication in a due time. In a recent survey report we saw that lot of web spammers try to create spam reviews on genuine products and try to make them become

negative and also they tried to change the negative reviews into positive reviews for the products which are mostly opposed by the social users [2]. This is often not in the least identified or blocked by any administrator as we can't ready to identify who is giving the abused messages in sort of comments or replies to the OSN network. Till now we don't have any pre-defined method to identify such a fake messages and block those things by not allowing them to post on the genuine user walls.Hence in this proposed paper we mainly motivated to design the classification of online fake reviews posted by spammers by using some supervised and semi-supervised machine learning algorithms [3].

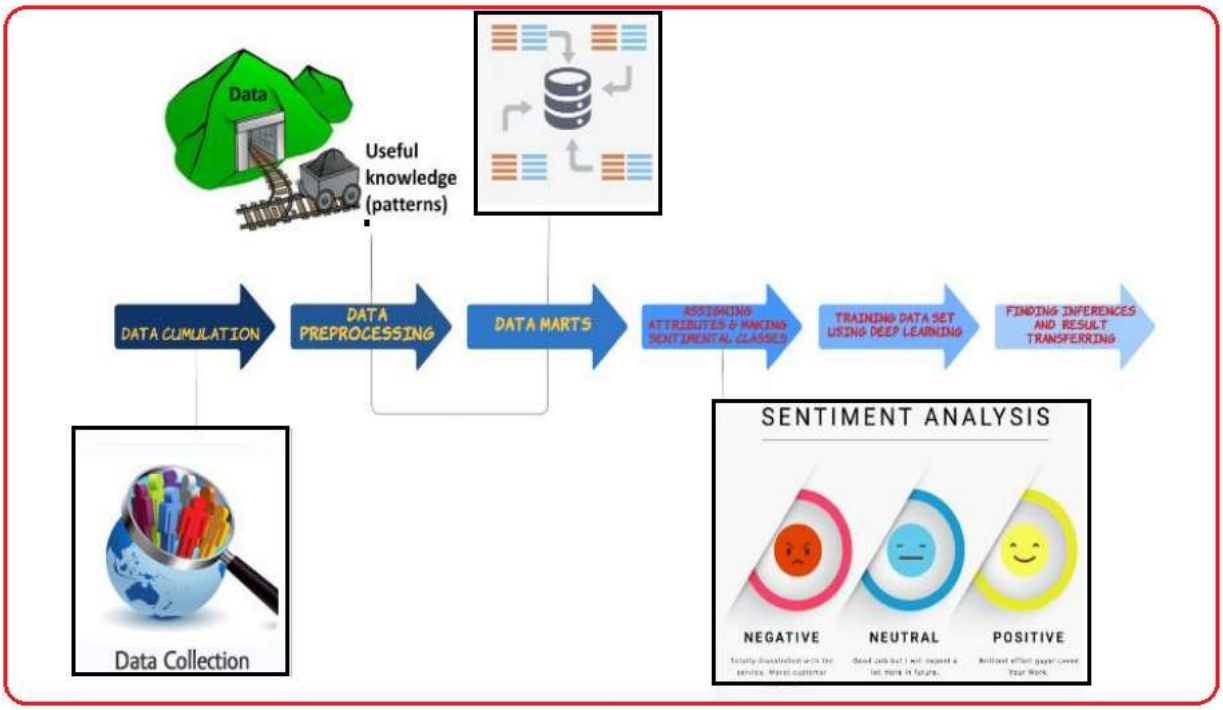


Figure 1. Represent About the Sentiment Analysis from a Large Data Source

From the above figure 1, we will clearly identify the process of sentiment analysis extraction from a large data source. Initially we try to collect a bulk amount of data and start applying the machine learning approaches like data cumulation, data pre-processing. Once these are completed the data will be divided into a proper data set and those values are stored in the data mart which is present in the network. In order to extract the relevant information from that raw data, we try to apply the training method on input data set using deep learning methods and now the data can be extracted immediately based on three views like positive, negative and neutral. If the reviews contain all positive meaning then such reviews are termed as positive sentiment and if the same reviews contain negative comments, then such a reviews are termed as negative reviews. Those which are neither positive or negative in meaning is known as neutral reviews[4].

In this current paper we try to find out the fake online reviews posted on movies database and we try to apply the supervised learning on movie dataset, in which the admin try to collect a set of new movies information and this will be viewed and rated by the end users. Here the user can able to give the sentiment or review based on multiple parameters like: Rate by Movie, Religion and Rates. Here we can

able to identify those who gave interesting feedback about movies which are positive and those which are un-interesting concept which are almost negative reviews separately and we can able to figure out the graph by taking all these parameters[5].

2. LITERATURE SURVEY

Literature survey is that the most vital step in software development process. Before developing the tool, it's necessary to work out the time factor, economy and company strength. Once this stuff is satisfied, ten next steps are to work out which OS and language used for developing the tool. This literature survey is mainly used for identifying the list of resources to construct this proposed application.

MOTIVATION

Here we try to conduct the systematic literature review and try to derive the answers to specific research questions, whereas this current paper will give us a broad idea about the sentiment analysis and its importance in identification of fake online reviews posted by spammers[6]. This SLR is performed using the some important rules and regulations and also they can be termed according to the committee. The key function for this proposed SLR is to extract the best features from the data set and how can we extract the best feature extraction techniques, and present different existing models for spam review detection and available parameters to analyze these models. From the figure 2 ,we can able to describe the several important phases of the SLR and how they are performed[7] .

Figure 2.Represent the Systematic Literature Review Process

Importance of SLR

It is very necessary for one to collect the exact reason for proposing this application from the existing literature. The SLR is one which can try to provide the questions and answers which are collected for proposing this current application[8] . Now let us look about them in detail as follows:

Table 1. Research Questions.

ID	Research Question	Motivation
RQ1	Which feature engineering techniques are used for construction or extraction of features from review datasets?	To understand different available review dataset and approaches of feature engineering and how these approaches help for extraction of useful features from data.
RQ2	What methods are used to solve the problem of spam review detection?	To identify existing spam review detection models and analyze these models based on their accuracy score.
RQ3	Which performance metrics are used to evaluate the performance of spam review detection methods?	Study different metrics which are used to evaluate the performance of different spam review detection methods.

3. PROPOSED CLASSIFICATION OF FAKE REVIEWS IN ONLINE SOCIAL NETWORKS

In this section we will mainly discuss about the proposed Classification of Fake Reviews in Online Social Networks using supervised and semi-supervised algorithms. Now let us discuss about this proposed model in detail as follows:

MOTIVATION

A well-known author Chauhan *et al.* [8] try to propose a method for classification of normal reviews and anomalous tweets separately. In general the abnormal tweets are observed on twitter with the help of URL anomaly where a spammer try to create a fake tweet by duplicating the same content in his own wall based on fake URL[9].Such a type of tweet user is identified as spammer and such user need to be revoked from further accessing the twitter account. This is also identified as the process in which the intruders try to create some fake content and convert the genuine account into anonymous account by injecting false data inside the reviews and this can be collected from several examples. The proposed methodology, which is used to identify various anomalous activities from social networking sites over movies database, comprises the following features [10]-[12].

1) URL RANKING :

This is the primary function in OSN networks in which for each and every post there will be some URL which is available to upload the data into the database. This feature will be changed from user to user based on different types of inputs. This will try to identify the authenticity of the post in OSN networks. In our project we try to take movie database and for adding each and every individual movie details the admin will try to use this URL ranking facility.

2) SIMILARITY OF TWEETS

This is also considered as one of the main feature in which the tweets which are having similar content is identified and they need to be marked as duplicate tweet based on the content type. This will try to identify the count of tweet which is duplicated multiple times by the OSN user. In our current application we try to consider the movie tweets which are posted multiple times with same content.

3) TIME DIFFERENCE

This is the third main function which is used to identify the time gap for each and every post which is submitted in the online social networks. This will mainly identify the count of tweets which are posted in less than 1 minute. In our proposed application this is mainly used to calculate how many tweets are posted in less than 1 minute.

4) MALWARE CONTENT

This is one of the main function which clearly state that if there are any malware or virus content added in the database. If the admin try to add any malware related movie database content this will be identified by this function and this will try to list out how many such contents are present in the OSN networks. In this application if the admin add any malware content related to movie database, then such type of posts need to be identified by the OSN network.

5) ADULT CONTENT

This is the last function in OSN network which try to identify if any adult content is present in the database. If there is any adult content which is added in the database, this should be identified and try to block such contents not to be added in the database. In most cases some movies may contain such a vulgar or bad content and this should be identified by the system and try to avoid such contents not to be available in the online social networks.

If all the above functions are identified properly then there will be proper identification of fake users and spammer who is present in the online social network.

4. IMPLEMENTATION PHASE

The proposed application is divided into mainly 2 modules and they are many sub-modules present in these main modules. Now let us look about them in detail as follows:

1. Admin Module
2. User Module

Now let us discuss about each and every module in detail as follows:

1. ADMIN MODULE

In this module, the Admin has to login by using valid user name and password. After login successful he can do some operations such as View All Users and Authorise,Add Movie, View All Movies, View All Movie Reviews, View All Reviews by Rates, View All Movie Recommendations, View All Interesting and Uninteresting Movies, View All Search History, View All Purchased items and booked Movie ,View All Fake Reviews By Movie, View All Fake Reviews By Region, View All Fake Reviews by Rates ,View Movies Rank in chart

2. USER MODULE

In this module, there are n numbers of users are present. User should register before doing some operations. After registration successful he has to login by using authorized user name and password. Login successful he will do some operations like View My Profile, My Accounts, View All Movies, View All My Purchased Items and Movies, View All Recommended Items and Movies for me.

5. EXPERIMENTAL REPORTS

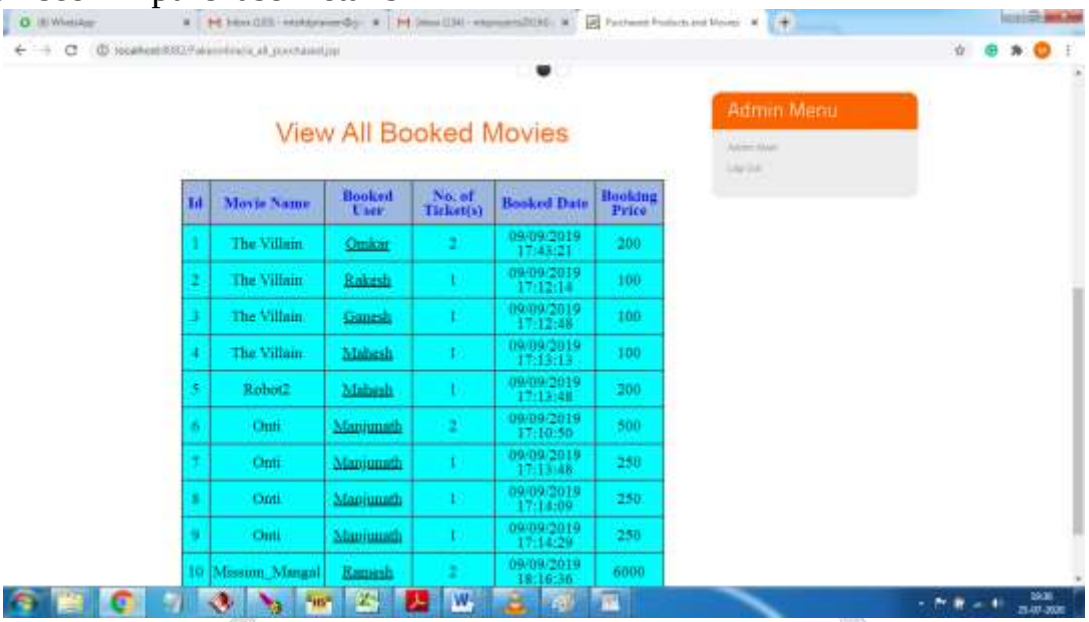
ADMIN CAN SEE MOVIE RECOMMENDATIONS

Figure . Represents the Movie Recommendations

Admin can see List of Interesting and Un-Interesting Movies

Figure Represents the Two categories

Admin can see All purchase Details



Id	Movie Name	Booked User	No. of Ticket(s)	Booked Date	Booking Price
1	The Villain	Omkar	2	09/09/2019 17:43:21	200
2	The Villain	Rakesh	1	09/09/2019 17:12:14	100
3	The Villain	Ganesh	1	09/09/2019 17:12:48	100
4	The Villain	Mahesh	1	09/09/2019 17:13:13	100
5	Robot2	Mahesh	1	09/09/2019 17:13:48	200
6	Onti	Manjunath	2	09/09/2019 17:10:50	500
7	Onti	Manjunath	1	09/09/2019 17:13:48	250
8	Onti	Manjunath	1	09/09/2019 17:14:09	250
9	Onti	Manjunath	1	09/09/2019 17:14:29	250
10	Mission_Mangal	Ramesh	2	09/09/2019 18:16:36	6000

Figure Represents the All purchase Details

ADMIN CAN SEE LIST OF FAKE REVIEWS

Id	User Name	Movie Name
2	Manjunath	Kaala
5	Ramesh	Mission_Mangal
2	Manjunath	Onti
3	omkar	Rjakumara
2	Manjunath	Robot2
4	Omkar	The Villain

Figure . Represents the Fake Reviews

Admin can see List of Fake Reviews by Rate

Figure . Represents the Fake Reviews based on Rate

Admin can see List of Movies in Chart Manner

Figure . Represents the Chart

6. CONCLUSION

In this paper, we for the first time design and implemented the method to cclassification of fake reviews in online social networks using supervised and semi-supervised algorithms. Here we try to take movie dataset as input and then check the reviews which are posted by the various online social network users. Here we try to apply the supervised and un-supervised learning algorithms and try to find out the

characteristics like: URL ranking, tweet similarity, time difference, malware content and adult content for identifying the fake reviews. By conducting various experiments on our proposed model we finally came to an conclusion that our proposed approach is best in identifying the fake reviews from a set of reviews that is posted based on some spam keywords.

7. REFERENCES

[1] Two Well-known authors, Chengai Sun, Qiaolin Du and Gang Tian, has written a paper on"Exploiting Product Related Review Features for Fake Review Detection," Published in Mathematical Problems in Engineering, 2016.

[2] Two Well-known authors , N. Salim, and Z. Heydari, has written a paper on "Detection of review spam: a survey", Published in Expert Systems with Applications, vol. 42, no. 7, pp. 3634–3642, 2015.

[3] Two Well-known authors , C. Cardie, and J. T. Hancock, has written a paper on "Finding deceptive opinion spam by any stretch of the imagination," Published in June 2011.

[4] Two Well-known authors , M. E. Francis, and R. J. Booth, has written a paper on"Linguistic Inquiry and Word Count: Liwc," Published in vol. 71, 2001.

[5] Two Well-known authors, R. Banerjee, and Y. Choi, has written a paper on "Syntactic stylometry for deception detection," Published in Vol. 2, 2012.

[6] A Well-known author Keele, S, has written a paper on "Guidelines for Performing Systematic Literature Reviews in Software Engineering; "Published in Ver. 2.3 pp. 1–57. 11

[7] A Well-known author Kitchenham, B, has written a paper on" Procedures for Undertaking Systematic Reviews; Joint technical report" Published in Computer Science Department, Volume 51, pp. 7–15.

[8] Two Well-known authors , X. Wei, and J. Shao, has written a paper on" Spotting fake reviews via collective PU learning" Published in ICDM, 2014.

[9] Two Well-known authors L. Akoglu and C. Faloutsos, has written a paper on" Opinion fraud detection in online reviews by network effects",Published in ICWSM, 2013.

[10] Two Well-known authors R. Shebuti and L. Akoglu, has written a paper on" Collective opinion spam detection: bridging review networks and metadata", Published in ACM KDD, 2015.

[11] Two Well-known authors , S. Feng and Y. Choi, has written a paper on "Syntactic stylometry for deception detection", Published in Proceedings of the 50th Annual Meeting of the Association for Computational Linguistics: Short Papers; ACL, 2012.

[12] Two Well-known authors, N. Jindal and E.-P. Lim, has written a paper on" Finding unusual review patterns using unexpected rules", Published in ACM CIKM, 2012.