

Fake News Detection Using Stochastic Gradient Descent Algorithm

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Abstract: Today the use of social media has been tremendously increased, but since there is no control over the social media there has been spread of fake news, messages like a drop of oil in water which has been proved hazardous to the humans. So the purpose is to develop a system which will classify the post or message either fake or genuine using Machine learning algorithm. Detecting Fake news is an important step. This work determines the use of machine learning techniques to detect Fake news.

Keywords - Fake news detection, Machine Learning, stochastic gradient descent

I. Introduction

Social media for news consumption is a double-barreled shotgun. On the one hand, it's easy to access, low cost and rapid distribution of information allows users to consume and share the news. On the other side, it can make rapid circulation of "fake news", i.e., low-quality news with intentionally false information. The quick spread of fake news has the potential for disastrous impacts on individuals and society. For example, the recent fake news of child lifers has caused mob lynching in India. This has made fake news a hot topic for researchers to politicians.

II. Statement of Problem

Nowadays' fake news is creating different issues from mordant articles to a formulate news and plan government propaganda in some outlets. Fake news and a lack of trust in the media are growing problems with huge aftereffect in our society. A purposely misleading viral story is "fake news" but lately gibbering social media's discourse is changing its interpretation. Some of them now use the caption to decline the facts counter to their preferred aspect. So we look forward to develop software to check whether the shared message on WhatsApp is Fake or Genuine using the Stochastic Gradient Descent Algorithm.

III. Objectives

We have proposed a system with the following aims:

- To build a model which can differentiate between fake and real news?
- To develop an android app which will trigger on a copy of the text and when user will click on application popup the data or copied text will be sent to the server to check and as per the authenticity will be displayed to the user.
- To review current industry practices and researches regarding stopping the spread of fake news.

The result of this study will be valuable to the research as well as to social media giants in developing better practice and tools for detecting fake news.

IV. Preliminary Literature Review

A previous literature review shows that past studies are primarily focused on understanding and modeling system to stop the spread of fake news. Fake news is the contents that claim people to believe with the disinformation, sometimes it is the delicate messages. When the messages were acknowledged, they will rapidly disperse it to others. The circulation of fake news in today's digital world has affected a specific group. Mixing both authentic and inconceivable information on social media has made the turbulence of truth. That is the truth will be hardly classified. However, the appearance of fake news causes a great hazard to the safety of people's lives and property. There are false or disinformation in fake news generation. Limited evolution has been made in deploying the system. Various approaches have been suggested for fake news detection. For example, many machine learning algorithms are applied to deal with fake news. Much research uses the sentiment analysis and emotion classification to identify the fake news but it depends on the language's content.

- Naïve Bayes is a well-known classification method.
- A neural network is an arithmetical model for the information computation process with the connectionism and the parallel distributed processing.
- Support Vector Machine (SVM) is the classification method of supervised learning.

V. Methodology

Input includes the copied text or news from the user.

Output includes authenticity of that copied news from the user.

1. Processing

Typically, the system will expect input from the user i.e. copied text from the user so that we can apply stochastic gradient descent which can differentiate between true and fake news. we will use the stochastic gradient descent algorithm since previous research has found that use of the algorithm has more accuracy than other machine learning algorithm.

1.1 Gradient descent variants

There are three various types of gradient descent, which conflict in how much data we use to count the measure the gradient of the objective function. Depending on the amount of data, we make compensation between the accuracy of the criterion update and the time it takes to perform an update.

- Batch gradient descent
- Stochastic gradient descent
- Mini-batch gradient descent

1.1.1 Stochastic Gradient Descent Algorithm:

Gradient descent is an algorithm used to perform optimization and by far the most common way to optimize neural networks. Batch gradient descent performs unnecessary calculations for large datasets, as it recomputes gradients for related examples before each parameter update. SGD does away with this redundancy by performing one update at a time. Therefore SGD is much faster and can also be used to learn online.

SGD performs frequent updates with a high deviation that cause the objective function to oscillate heavily

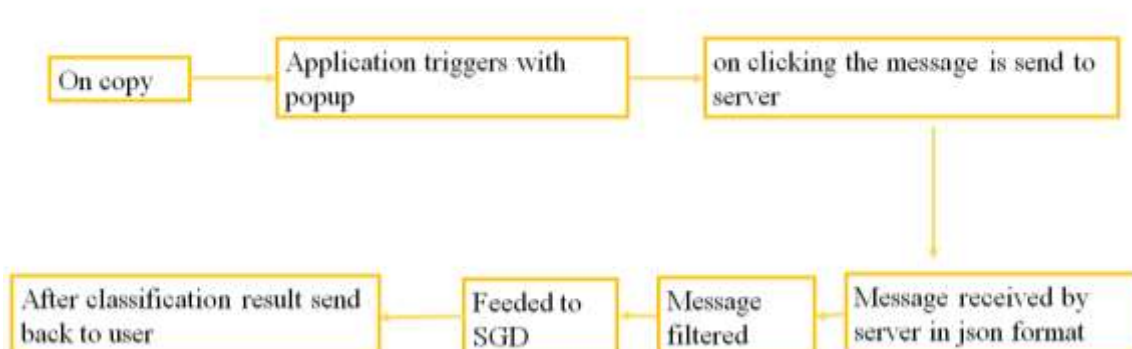
2. Functional Objectives

Providing tight security to the data is the main functional objective. The data file provided as input to the system will be sent to the server in an encrypted state.

3. Working

As described earlier the data will be sent to the server, then bigrams and TF/IDF will be calculated and finally, the comparison will be done.

4. Data Flow



VI. Conclusion

It is crucial that we have some system for detecting fake news, or at the very least, an awareness that not everything we read on social media may be true, so we always need to be thinking critically. This way we can help people to take more correct decisions and they will not be fooled into thinking what others want to manipulate them into believing.

Thus by developing this product, we will be able to detect fake and genuine news thus retaining trust on social media.

References

- [1]. Granik, M., & Mesyura, V. (2017). Fake news detection using naive Bayes classifier, *2017 IEEE First Ukraine Conference on Electrical and Computer Engineering (UKRCON)*. doi:10.1109/ukrcon.2017.8100379
- [2]. Gilda, S. (2017). Evaluating machine learning algorithms for fake news detection, *2017 IEEE 15th Student Conference on Research and Development (SCORED)*. doi:10.1109/scored.2017.8305411
- [3]. Krishnan, S., & Chen, M. (2018). Identifying Tweets with Fake News. *2018 IEEE International Conference on Information Reuse and Integration (IRI)*. doi:10.1109/iri.2018.00073
- [4]. Parikh, S.B., & Atrey, P. K. (2018). Media-Rich Fake News Detection: A Survey, *2018 IEEE Conference on Multimedia Information Processing and Retrieval (MIPR)*.doi: 10.1109/MIPR.2018.00093
- [5]. Buntain, C.,&Golbeck, J. (2017). Automatically Identifying Fake News in Popular Twitter Thread, *.2017 IEEE International Conference on Smart Cloud*.doi:10.1109/SmartCloud.2017.40