

Fake News Detection and Flagging

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Abstract

False or fake news is a type of gutter press or disinformation, according to Wikipedia, consisting of deliberate misinformation or farce pro-pagating by mainstream press, internet dissemination and online social networks. The fake news of these days is causing various issues in some media from satirical posts to a fabricated news and government propaganda program. False news and lack of media confidence are rising issues in our culture, with major repercussions. Obviously, "fake news" is a purposely deceptive story, but lately blurring the dialogue on social media is changing its meaning. Some of them are now using the word to discard the evidence about their desired viewpoints. To separate fake news from what is real fact is necessary in today's world. Hence, we are going to employ our algorithms that we can identify and distinguish between what news is fake and what is real.

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1. Introduction

1.1 Motivation

India has the most social media users, with 300 million Facebook users, 200 million WhatsApp users and 250 million active YouTube users. TikTok, a Chinese-owned (and immensely popular) video messaging company, has more than 88 million users in India. And there are Indian messaging apps like Share Chat that reportedly have 40 million users and allow them to communicate in 14 Indian languages. Besides the U.S., India is the only nation that has WhatsApp heading its own region. In November 2018 the establishment of "WhatsApp India" partially fulfilled the Indian government's demand to diminish the spread of fake news on the social media chat-app. The move took on significance in the wake of more than a dozen killings in 2018 across India in mob lynching cases allegedly fueled by rumors spread on social media. Another more recent and relevant example could be how fake "antidotes" to COVID-19, spreading like wildfire on almost every platform. Thus it becomes imperative to identify fake news and separate it from real news.

1.2 Objectives of the Project

This project mainly focuses on the following objectives:

- Produce a web app that helps users to identify fake news.
- Apply techniques like bag of words, TD-IDF and cosine similarity
- Predict the degree of how fake or how true a piece of news is.

2. Relevancy of the project

"Fake news is not journalism. Maybe we should think about what we [the mainstream media] did to journalism that has allowed fake news to become so easily accepted and so easily done. I think we should do some soul-searching to know if we are doing the right thing, if we are behaving in the right way, if we are being ethical in journalism — that could prevent fake news from having the power and influence it has, and stop the growth it has achieved."

Catarina Carvalho, Editor-in-Chief,
Global Media Group, Portugal

This is the proposed method of training this project is incredibly relevant in today's world as fake news is more rampant than ever. This can help in stopping fake propaganda and further the spread of actual, true news for the consumption of the public. It can prove to be easily accessible for everybody from almost all walks of life. It

can serve as a personal check for verifying any news for yourself and thus the user becomes aware of sources that publish fake news and those that don't. Hence, this project can be relevant in today's world where there is constant exchange of information. Fake news isn't incredibly new but it has become a very heated topic of discussion. Traditionally we mostly receive news from reliable and trustworthy sources for eg: news channels and professional journalists and media personnel that follow strict codes of conduct when it comes to delivering news to the people that consume it. But of late, with almost zero editorial restrictions, the World Wide Web has created an entirely new way of writing, consuming or reading information.

3. Literature Survey

Papers pertaining to fake news:

In the first reference, the widespread exposure and rapid development of the information posted on social media networks has made it difficult to distinguish between false and true information. The rapid dissemination of information through sharing has led its forgery to exponential growth. At risk is also the credibility of social media networks where the dissemination of false information is prevalent. The automated knowledge testing viz a viz its source, content, and publisher has thus become a search challenge to categorize it as false or real. Machine learning has played a vital role in classifying the details, albeit with some limitations[1].

Second reference states intentionally misleading content delivered under the umbrella of legitimate journalism is a question of worldwide knowledge quality and honesty that influences habits of opinion forming, decision taking and voting. Much of the so- 'fake news' is first circulated through social media conduits such as Facebook and Twitter, and then makes its way into conventional media outlets such as traditional TV and radio news. The false news articles that are initially planted over social networking sites share core linguistic features such as heavy use of unsubstantiated hyperbole and cited material that is not credited [2].

Third reference says social media, believes has replaced the mainstream media and become one of the biggest news distributing outlets. Because of the Internet openness and convenience, news on social media continues to spread quicker and easier than conventional news outlets. All the news released on social media, however, is not authentic and/or derived from unverified sources. False information can be easily generated and disseminated via social media and this false news can potentially or deliberately mislead or misinform readers. The widespread dissemination of fake news is having a negative impact not only on the user but also on society[3].

Fourth reference takes the very relevant example of 2016 Presidential elections in the United States of America. Fake news has been the topic of much debate

and discussion. In this context, there is a proposal for a general system that can be implemented at future worldwide elections to increase people in better decision taking when it comes to understanding news fraud and detecting the author's secret bias. We created a dataset on "Hilary Clinton" comprising 200 tweets for our research, while carrying out veracity assessments. We initially perform "text normalization" on tweets, explore techniques for extraction of features to classify news into categories, conduct a detailed linguistic study on tweets, extract bag-of-words to identify recognizable trends, and finally apply k-nearest neighbor[4].

The fifth reference paper says that looking at the recent spate of claims regarding 'fake news,' which tend to be a modern phenomenon in political debate, the author argues that fake news presents a major epistemological and ethical issue. Fake news trades in tolerating a certain indifference of facts, which political leaders sometimes insincerely express. The way we set the limits of the 'public' epistemology that determines what is permissible political discourse enables this cynicism and insincerity to flourish. The author suggests that one possible solution to the problem of false news is by adding some sentiment into the discourse to challenge this public epistemology [5].

4. Methodology

On this project, the main focus is on the claim that a certain piece of news asserts. To determine if this news is fake or not, we'll be working with articles that will be taken from legitimate or verified sources. Therefore, we can divide the working of this project in to two entities: the claim made by an unverified source of news (provided by the user) and actual articles taken from journalism pertaining to the given topic. Both the claim and the article can be broken down into a title and it's body or the content – the title being the headline that is likely to grab the user's attention. The body meanwhile is the actual content of the news/the claim. Machine learning algorithms cannot work directly with the raw text. Then, the text has to be translated to number vectors. A common technique for extracting features from text in natural language processing is to put all of the words that appear in the text in a bucket. This technique is called a prototype word pack, or short BoW. This is called a "pack" of words, since all information about the sentence's meaning is lost. Both the title and the content will be put forth in the form of Bag-Of-Words-Term- Frequency

A bag-of-words model, or BoW for short, is a way to extract features from text for use in modeling, for example with algorithms for machine learning. The technique is very simple and versatile, and can be used to remove features from documents in a multitude of ways. The limit for BoW can be 5000 words. Term frequency pertains to the number of times a word appears in a document that is divided by the total number of words in text. Each document has its own frequency for term. We

need to apply this to both the claim as well as the article. Now it's important to note that we have about four Bag-Of-Words. These four Bag-Of-Words need to be expressed in the form of feature vectors. In machine learning feature vectors are used to represent numerical or symbolic characteristics of an entity in a statistical, easily analyzable manner, called features. In many different areas of machine learning and pattern processing, these are significant. Feature vectors are the equivalent of explanatory vector variables used in statistical techniques such as linear regression.

Therefore, we will get two feature vectors – combining two Bag-Of-Words of the claim and the remaining Bag-Of- Words of the article. After we get two feature vectors, the next move is to combine them and obtain TF-IDF cosine similarity. Inverse Document Frequency or IDF can be defined as the log of the number of documents divided by the number of documents containing a certain word. Inverse frequency of data influences the weight of rare terms in the corpus over all records. TF-IDF (term frequency-inverse document frequency) is a statistical measure which assesses how important a word is to a document in a document set. That is achieved by combining two metrics: how many times a word appears in a document, and the word's inverse frequency of document across a series of documents. The similarity of cosine describes the resemblance between two or more documents by calculating angle cosine between two vectors extracted from the documents. Cosine similarity can be calculated by considering the dot product of measured document vectors in the previous step. Essentially, this step will tell us how similar two documents are i.e. in this case the claim and the article.

Based on this, the algorithm predicts that if the article agrees, disagrees, bears a neutral stance or is unrelated to the claim at hand. This has been expressed in the diagram shown below.

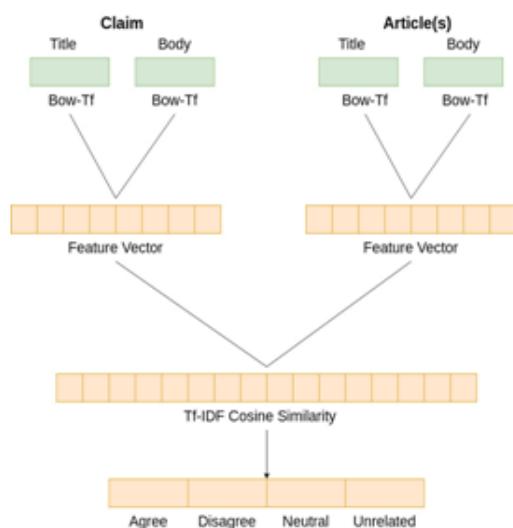


Figure 1: Pictorial representation of the workflow of the project

5. Applications

This project would be best implemented in the form of a web- application – an online platform where the user can paste a link and obtain the output. Let's say the user comes across an article that they believe is suspicious or could be fake. This, to confirm, they copy the link of the tweet and paste into a prompt available on the web app. The article is subjected to the methodology as specified above and produces the required result. A web app will prove to be easy and quick, thus providing potential users with away to verify the information that they come across on a daily basis in a hassle-free manner. The potential interface has been shown below – it has been developed using Django Chain.



6. Conclusion and Future Scope

Research have shown that a lot of people cannot say what fake news is and what true news is. It can generate uncertainty about significant socio-political problems and misunderstandings. Likewise, there are also false and inaccurate news stories about medical conditions and significant illnesses such as cancer or diabetes. Trusting these false reports could lead you to make decisions which could damage your health. Thus, it is incredibly important to fight fake news in the right manner and spread word about it as well. The main purpose of this project is to do the same – to separate facts from disinformation. False propaganda is a very real issue that needs to be dealt with and hopefully this project achieves it's goals in doing so.

As for implications and scope of such a project in the future, it is important to consider the fact that news is a factor nobody can avoid, especially in a democracy. In today's world, information exchange will only continue to grow and so, the importance of consuming the right information will forever be imperative. Thus, this project has great relevancy in the future as well – it can be extended to an audience of users that come from all walks of life. Fake news is still on a rampant rise as we speak. COVID-19, being one of our most pressing problems today, has brought with it an entirely new slew of fake news. We are consuming information from whatever sources we have available immediately. There is no filter for news being consumed at such an alarmingly fast pace.

Thus, news is inescapable and it's best if everybody is delivered accurate information and that's what such a project primarily aims to achieve in the future.

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