Project Proposal – Draft

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DATA 698

September 9, 2022

Research Question

For this project I chose to analyze news datasets to identify true versus fake information, or as it has been described on social media, real news vs fake news. People spend most of their time on the internet so we are more likely to get our news from online articles instead of television. Information is spread quickly and easily through social media but how can we tell if the information we are reading is accurate? What are the consequences of a fake article being misrepresented as true? Are most of these "fake" articles negative news?

Facebook has been accused of prioritizing Social media is known for having an algorithm that prioritizes negative posts to a user's feed since people are more likely to interact with content that sparks a negative emotional reaction. [1] Using the pandemic as an example, this was such a scary time for all and the spread of misinformation about a new virus was dangerous and potentially deadly. Facebook updated their system to compare information against a fact-checker and flag posts as false. [2] Twitter has also attempted to stop the spread of misinformation by asking users to flag posts that "seem misleading". [3] The existence of fake news is not new and is also not unique to the spread of pandemic information on social media in the past two years. What makes this so important today is just how easily information is shared to a large group of people. A system is needed to accurately identify misinformation as quickly as this information is spread and is needed across the web, not just on social media platforms.

I am glad to see these social media companies attempting to identify and stop or slow the spread of misinformation. I would like to learn how these companies are identifying the misinformation. What is the common thread between these articles and how accurate is it? I plan to build a model that can categorize the information as real or fake.

Research

My main data source will come from Kaggle's [Fake and Real News Dataset](https://www.kaggle.com/datasets/clmentbisaillon/fake-and-real-news-dataset?select=Fake.csv) [4], a dataset that contains two files already categorized as real and fake. This will be used to identify predictors and train the model to categorize new datasets. I will also use the [All the News](https://www.kaggle.com/datasets/snapcrack/all-the-news?select=articles1.csv) [5] dataset which contains articles that we expect to be classified as true. This will also be used to test the accuracy of the model.

My goal is to use as many datasets as possible to train the model. The most accurate model would be one that can also leverage a fact checker, but this is not something we have access to.

This academic paper about the Development of Fake News Model Using Machine Learning through Natural Language Processing is another resource for this project. [6] This paper breaks down fake news into 6 categories from False Connection which is described as "When headlines, visuals or captions don't support the content", to Fabricated Content which is described as "New content that is 100% false, designed to deceive and do harm."

Research Methods

I have found some resources that breakdown using machine learning to detect fake news using Python. Data Flair gives an example of a machine learning model built using a Passive Aggressive Classifier [7]. Data Flair describes this algorithm as remaining "passive for a correct classification outcome, and turns aggressive in the event of a miscalculation, updating and adjusting."

I will also use the LIAR Dataset from Activeloop [8]. It contains 12,800 classified short phrases and will be used to build the model for fake news detection. The kaggle data just has two discrete categories, True or False. The LIAR dataset expands the categories to pants-fire, false, barelytrue, half-true, mostly-true, and true. It will be interesting to see how the accurate the model will be with 6 categories instead of just two. If we think about the impact of more categories, I think it makes more sense to have more nuanced categories instead of a Boolean category.

Sources

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