Fake News Detection - Project Proposal

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Abstract —In this assignment, we will do an in-depth analysis of detecting fake news from news websites, including phony news characterizations based on psychology and social theories, current algorithms from a data mining point of view, evaluation metrics, and representative datasets.

I. MOTIVATION

Due to rapid dissemination, ease of access, and low cost, social media is becoming increasingly popular for news consumption. However, it also allows for widespread fake news containing intentionally false information. Detecting fake news is a critical task that ensures users receive accurate information and contributes to the sustainability of the news ecosystem. Most existing detection algorithms focus on extracting clues from news content, which is generally ineffective because fake news is frequently written intentionally to mislead users by imitating accurate information. As a result, we must investigate auxiliary data to improve detection.

The social context of news dissemination on social media creates an inherent tri-relationship, a relationship between publishers, news pieces, and users, potentially improving fake news detection. Bipartisan publishers, for example, are more likely to publish fake news, and low-credibility users are more likely to share fake news. In this project, we investigate the novel problem of detecting fake news by leveraging social context. In this paper, we propose running experiments on two real-world datasets to show that the proposed approach outperforms other baseline methods for detecting fake news.

II. METHOD

We are going to implement this project following a specific sequence of actions. Following this sequence will help us achieve our goals to further our project. We have listed the series of steps as follows:

- Data Acquisition
- Data Wrangling
- Exploratory Data Analysis
- Model Implementation
- Evaluation

1. Data Acquisition: - We will collect data from numerous sources, including Google – News and Kaggle, and we will primarily be working on textual data.

2. Data Wrangling: - The data pre-processing will take place in this step. This will help us to organize the data. Also, this process will eliminate the missing values and outliers within the data. In addition to that, as we are mainly focused on the text data, we will perform text cleaning and tokenization.

3. EDA (Exploratory Data Analysis): - Here, we will deal with the graphical representation of the data to understand and summarize the main characteristics of the attributes and the statistical values.

4. Model Implementation: - To classify the given News into either fake or real categories, we will implement a Classification model, various NLP (Natural Language Processing) techniques, and along with a language model (BERT). [1]

5. Evaluation: -We will evaluate the model based on the testing data. Moreover, we will pass the random, unknown news to check whether the information is true or false.

III. INTENTED EXPERIMENTS

As we stated above, the goal is to obtain a classification model to be used as a scanner for fake news by the news details like the headlines and the statements. Gradually, we'll embed the model in Jupyter - Notebook and do the preprocessing steps, feature selection, and model learning through different models, choosing the best from them by comparing the results.

To summarize, there will be a training and testing dataset. In both, preprocessing, transformation, and feature selections will be performed. After the noise removal, the model will be created, trained, tested, and verified. Finally, the user can check the doubted news and predict whether the news report/headline is fake or real. They can view and can even save the results obtained.

IV. PLANNING AND MILESTONES

We are planning to move step after step to achieve specified goals. Following is the task distribution for our project:

- Ajay Rajput: - Data gathering and wrangling (Cleaning, Tokenizing, etc.)
- Dhru Prajapati: - Exploratory data analysis and Feature Selection
- Rahul Rawal: - Model implementation, testing and training and evaluation.

GITHUB LINKS:

1. Rahul Rawal (C0871230): https://github.com/RahulRwl17/Data-Mining-and-Analysis-
2. Ajay Rajput (C0871742): https://github.com/ajayrajput99/Data-Mining-and-Analysis-3335-Project
3. Dhru Prajapati (C0867085): https://github.com/DhruPrajapati/Data-Mining-and-Analysis

References

[1] Google, "TensorFlowHub," TensorFlow, [Online]. Available: https://tfhub.dev/google/collections/bert/1.