INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY
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Technology, Social Impact

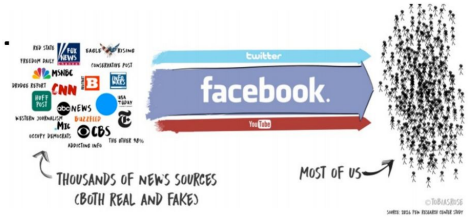
Fake News and Misinformation Detection

Introduction

The problem of content verification and misinformation has been an age old problem.

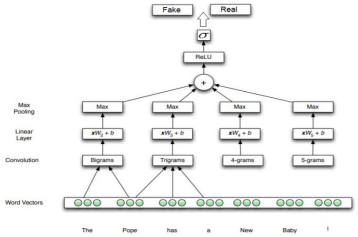
Since the rise in popularity of social networks, news is no longer monopolized by newspapers, TV, radio. The rate at which content is generated has grown exponentially. This leads to the proliferation of misleading information in everyday access media outlets such as social media feeds, news blogs, and online newspapers. This has made it challenging to identify trustworthy news sources.

Manual solutions can no longer keep up with the rate at which content is being churned out and hence we look at automated approaches for the problem.



1. Fake-o-meter

There are a few fact-checking websites online that manually verify the veracity of a story.
We collected 12000 fake and real news titles from Politifact.com The data consisted of 50% Fake, 50% Real articles. Crafting manual features at linguistic, word and sentence levels and pairing that with distributed word embeddings, we used that as the training input for the model and trained a supervised learning classifier. Calculates a fakeness score for each news item, the probability of it being fake and has achieved an accuracy of 72% in determining the veracity of the news.
We have domain specific models for different domains, like politics, celebrity, health and even different languages.

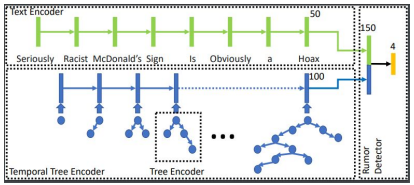


— Fake-o-meter Architecture

2. Text and Temporal Tree Networks

Social Media Platforms like Twitter limit posts to 280 characters meaning there are very few words involved. This limits the effectiveness of purely content based methods. Hence we build a novel architecture that leverages deep learning based architectures to encode text, user and tree information in a temporal-aware manner.

Our extensive comparisons show that our proposed methods outperform the state-of-the-art techniques by ~7 and ~6 percent points respectively on two popular benchmark datasets, and also lead to better early detection results.



— Simplified Architecture Diagram for Text and Temporal Tree Network

3. Identifying Covid Fake News in Social Media

Factually incorrect advises can sometimes create false sense of health and might delay in getting the required medical help often aggravating the condition, specifically relating to the COVID-19 pandemic.
With the effectiveness of architectures like Transformers, the field of NLP has been revolutionized. We use RoBERTa, a improved variation of BERT for identifying if the COVID health news is fake or real.
In this work, we train models which can identify health news related to COVID-19 pandemic as real or fake. Our models achieve a high F1-score of 98.64%

4. Future Work

We are also looking towards more multimodal and multilingual aspects of this problem. This is a problem we see in regional languages as well and are looking at collecting data to evaluate the multilingual setting. We are also looking at multimodal aspects of the problem where we see an image along with the text associated with a post.

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