Vivekanand Education Society's Institute of Technology

Department of Computer Engineering

Group No.: 45

Project Synopsis (2024-25) - Sem V

Reality Check

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Abstract:

Misinformation can cause public confusion, political polarization, and potential harm to public health and safety. This underscores the need for accurate identification of false news. Although fact-checking websites provide essential services, their manual processes restrict their scalability and coverage. Also while numerous models currently exist, our model is designed to significantly enhance the accuracy of fact-checking. This research proposes the development of an automated, web-based fact-checking platform to address this challenge. Our solution leverages a specialized, continuously updated dataset sourced from credible RSS feeds and web scraping techniques to enhance fact-checking accuracy within specific domains. The platform will feature a user-friendly interface, enabling users to submit claims and receive detailed verification results, including explanations and sources. We will evaluate and refine various algorithms to address domain-specific challenges, aiming for a highly accurate fact-checker.

Introduction:

Fake news is a serious problem that can mislead the public, fuel animosity, and distort reality. The emergence of advanced language models like ChatGPT have increased this issue. While fact-checking websites such as PolitiFact and Snopes provide valuable services, their manual approach limits their capacity. Several existing models use both text and images to substantiate their claims, which can affect their accuracy. These models generally involve retrieving evidence, assessing claims, and generating explanations, and they have demonstrated limitations in this area. We believe that a novel approach is essential to achieve substantial progress in this field. Therefore, we propose automating the fact-checking process through the development of a specialized dataset tailored for specific domains. Our approach aims to enhance the scope and efficiency of fact-checking by leveraging advanced algorithms to systematically evaluate and verify claims. Through rigorous experimentation with various algorithms, we aim to develop a highly accurate fact-checker.

In the fast-paced world of news, where updates occur every second, it's crucial to use resources such as RSS feeds to continuously update our model. While some existing models may be accurate, they often struggle with real-time relevance. Information that was previously false could become accurate over time, highlighting the need for a system that stays current with the latest developments.

Problem Statement:

The rapid spread of false information online is hindering public discourse and trust. Existing methods for identifying fake news can be improved to address the scale and sophistication of misinformation. Existing datasets are outdated, and we aim to develop a system capable of verifying even the most recent facts.

Proposed Solution :

The proposed solution is a web-based platform designed to accurately fact-check claims in specific domains, including science, politics, and history/sports. We aim to enhance accuracy by building dataset from credible resources providing RSS feeds, and is continuously updated. The platform will offer a user-friendly interface, allowing users to submit claims, receive verification results, and access detailed explanations along with the sources used.

Methodology :

1. Data Collection
   - Identifying legitimate sources with reliable RSS feeds.
   - Use web scraping techniques to extract data from these sources. This includes headlines, article content, publication dates, and author information, etc.
   - Compile the extracted data into a structured, personalized dataset, ensuring it covers a comprehensive range of topics within the domain.

2. Data Preprocessing
   - Removing duplicates, irrelevant content, and incorrect entries.
   - Categorize and tag data according to topics, sub-topics, and relevant metadata.

3. Model Training
   - Evaluate current models and algorithms for accuracy and suitability.
   - Adjust models to improve accuracy and address domain-specific challenges.
   - Find areas for improvement and iterate on model development.

4. Claim Verification
   - The system cross-references the claim with the dataset to check for accuracy. The verification process includes matching the claim's content with the information in the

dataset and assessing the credibility of sources.

5. Explanation and Sources
   - After verification, the model provides with the result, indicating whether the claim is true, false, or uncertain.
   - Including a summary of the reasoning behind the verified fact.
   - Listing the sources and evidence used in the verification process.

6. UI/UX Design
   - Design an interface that allows easy submission of claims and access to verification results.
   - Clearly display the verification results, explanations, and sources in an organized manners.

Hardware Requirements:

1. Computer: The model will be developed and tested on a standard personal computer with a minimum of 8GB RAM and a multi-core processor (Intel i5 or equivalent). For more intensive tasks such as model training, a computer with a dedicated GPU (e.g., NVIDIA GTX 1060 or higher) is recommended.
2. External Storage: An external SSD with at least 500GB capacity for storing large datasets and model checkpoints.
3. Cloud Infrastructure (Optional): Utilizing cloud-based services such as AWS or Google Cloud for scalable storage and additional computational power during model training and deployment.

Software Requirements:

1. Jupyter Notebook: For developing and testing the model.
2. Pandas: For data manipulation and analysis.
3. NumPy: For numerical computations and array handling.
4. scikit-learn: For implementing machine learning algorithms and evaluation metrics.

5. TensorFlow/PyTorch: For building and training deep learning models, particularly if the model involves complex neural network architectures..
6. PHP: For backend development, integrating the model into a web application..
7. Docker: For containerizing the application to ensure consistency across different environments and ease of deployment.

Proposed Evaluation Measures

1. Model Robustness: Evaluate the model's performance across different types of data sources, including news articles, social media posts, and scientific publications, to ensure it performs well in various contexts.
2. Response Time: Assess the model's ability to provide quick and efficient responses to user queries, ensuring that it is suitable for real-time fact-checking applications.
3. Interpretability: The system should be transparent, offering insights into why certain information was classified as fake, possibly through a confidence score or explanation model.
4. Timely and Reliable Updates: Regular updates to the dataset and model are essential to maintain accuracy and relevance in detecting fake facts.
5. Accuracy of Information: The model will be evaluated on its ability to present data that accurately reflects the truth, minimizing false positives and negatives.

Conclusion:

As previously mentioned, fake news is detrimental, highlighting the urgent need for scalable, automated solutions. This research presents a novel approach to automated fact-checking through the development of a web-based platform that leverages a continuously updated dataset sourced from credible RSS feeds and web scraping techniques. It offers a significant advancement in the fight against misinformation, providing a scalable and automated fact-checking solution.The evaluation measures outlined, including model robustness, response time, interpretability, and accuracy, ensure that our solution remains effective and relevant in various contexts. By improving the speed, coverage, and accuracy of fact-checking processes, our platform aims to restore trust in public discourse and mitigate the harmful effects of fake news.

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