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ORIGINAL RESEARCH

A deep learning semantic segmentation-based document classification method

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Abstract – The introduction of the internet and internet-based existence has had a significant impact on people's lives. Additionally, mass media has an impact on everyday public life. Due to political power, many people take use of these rights to indulge in luxuries and elevate their social status. After COVID 19, People deliberately spread fake information through web-based social networking sites. This has an impact on how internet news sites originally operated and were intended. Therefore, we need some tools to automate the process and identify effective ways to classify it in order to stop the spread of such bad news. A computer vision based semantic segmentation method is proposed on a deep learning platform to perform muti-document analysis.

Index Terms – Deep learning, segmentation, document classification

I. INTRODUCTION

Online social networks have developed into a platform for individuals all over the world to obtain a wide range of news articles that are also well- liked. The medium via which news information is made available has changed significantly from the time of newspapers to contemporary internet. Fake news is low-quality content with purposefully false information that is disseminated by people or automated programs with malicious intent to manipulate messaging for snitching or political ends [1]. As a result, it is necessary to divide the news into two categories: legitimate news and fake news. An automated technology that can identify news articles is employed in place of the laborious and time-consuming manual tagging of news [2].

With respect to computer vision into consideration, many methods are in research towards document classification. There are multiple techniques in the literature such as logistic regression [3] and other statistical approaches [4] and certain ensemble methods. Out of these classifiers, they have a problem of overfitting with the dataset and all are discrete values which cannot be classified [5]. Many computers vision based semantic segmentation techniques are under research for efficient object recognition and classification [6,7,8]. With respect to document level analysis, semantic segmentation gives better comparison parameters. While training the dataset using deep learning aspect, semantic segmentation tries to capture a key with every pixel which gives guarantee towards better object recognition and classification [9,10].

II. PROPOSED METHODOLOGY

The proposed method has the following architecture as depicted in fig 1. Data Collection: The initial phase in the proposed work includes extraction of documents from the user's inputs which is in the form of emails, pdf, text files, documents etc. As there are multiple document with different modality that is they are not uniform, the set of documents are subjected to pre-processing. Pre-processing: During pre-processing, the

documents in different formats will be classified separately as tect files, emails, pdfs etc. This should take place with a document classifiers. The method is shown below in fig 2.

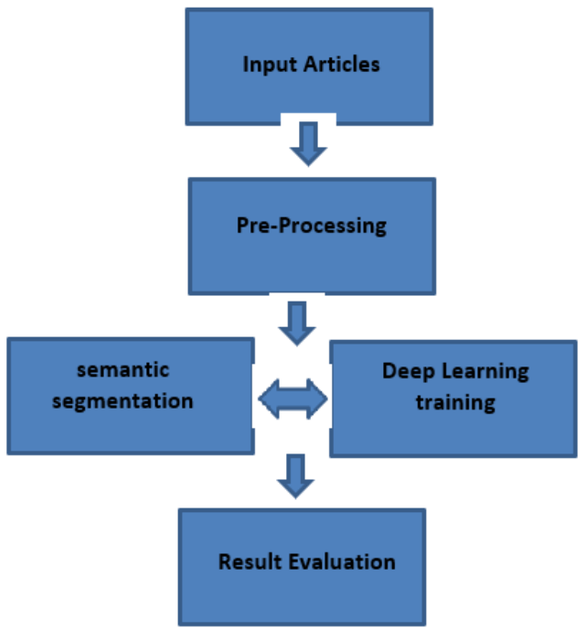


Fig 1: Proposed flow diagram

Fig 2: Multidocument classification (Pre-processing)

Semantic Segmentation: This phase involves segmenting the documents into its corresponding similarities. Feature descriptors from the document are extracted and thus based on the features idea segmentation is performed. It makes use of deep learning methodologies.

III. METHODS AND MATERIALS

The method is implemented in python where different cases of articles are extracted. As a part of pre-processing document analysis is carried out with feature vectors represented in python result as in fig 3 and 4

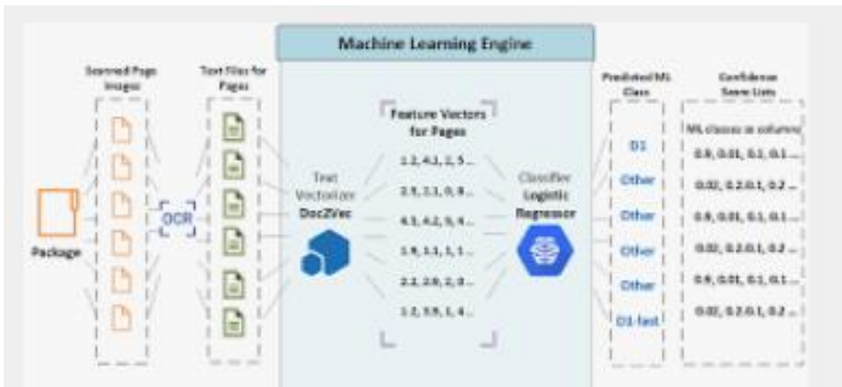
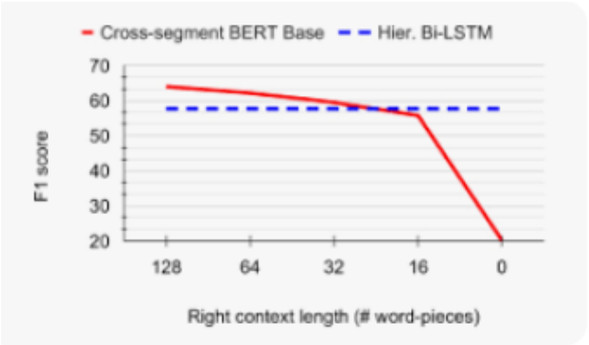


Fig 3: Feature vector representation in python



IV. CONCLUSION

One of the most crucial ways to inform people about events in and around our community is through the news. Therefore, those who create and disseminate it are responsible for stopping it from being genuine. In this study, supervised machine learning techniques and natural language processing are used to automatically classify news as either legitimate or fake.

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