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News Article Identification Methods with Fact-Checking Guideline on Artificial Intelligence & Bigdata

[1]Jangmook Kang, [2]Sangwon Lee*

[1]Prof., Dept. of Hacking & Security, Far East Univ., Korea
[2]Prof., Dept. of Computer & Software Engineering, Wonkwang Univ., Korea
2021035@kdu.ac.kr, sangwonlee@wku.ac.kr

Abstract

The purpose of this study is to design and build fake news discrimination systems and methods using fact-checking guidelines. In other words, the main content of this study is the system for identifying fake news using Artificial Intelligence -based Fact-checking guidelines. Specifically planned guidelines are needed to determine fake news that is prevalent these days, and the purpose of these guidelines is fact-checking. Identifying fake news immediately after seeing a huge amount of news is inefficient in handling and ineffective in handling. For this reason, we would like to design a fake news identification system using the fact-checking guidelines to create guidelines based on pattern analysis against fake news and real news data. The model will monitor the fact-checking guideline model modeled to determine the Fact-checking target within the news article and news articles shared on social networking service sites. Through this, the model is reflected in the fact-checking guideline model by analyzing news monitoring devices that select suspicious news articles based on their user responses. The core of this research model is a fake news identification device that determines the authenticity of this suspected news article. So, we propose news article identification methods with fact-checking guideline on Artificial Intelligence & Bigdata. *This study will help news subscribers determine news that is unclear in its authenticity.*

Keywords: *Artificial Intelligence, Bigdata, Fake News, Identification, Fact-Checking*

1. INTRODUCTION

In general, fake news is distributed through social network or networking service (SNS) sites such as Facebook, Twitter, Kakao Story, or public chat rooms on instant messengers, rather than through official media or portal sites with news editing rights. The spread of fake news through SNS or messenger is very rapid or powerful, but it is often distributed through trusted acquaintances who exchange contacts with cyber friends, so users accept the news as true without doubt. Also, it is difficult to determine authenticity because it has a reliable form of news articles provided by the official media. To address this problem, methods have recently been proposed to analyze the statements of the news through natural language processing techniques, find contextually inconsistent statements, or judge it as fake news compared to reliable similar news. In addition, a technology is proposed to analyze user responses on SNS sites and determine whether fake news exists based on responses. However, analyzing user responses to all documents shared on SNS requires a lot of computational time, and methods of analyzing context to find errors or judging authenticity against reliable similar news take a lot of computational time for semantic analysis and in a timely manner. The purpose of

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Corresponding Author: sangwonlee@wku.ac.kr
Tel: +82-63-850-6566
Professor, Dept. of Computer & Software Engineering, Wonkwang Univ., Korea

this study to address the above problems is to provide a system for identifying fake news applicable to fake news that takes no computational time and varies widely. In addition, the purpose of this study is to provide a device that monitors fake news applicable to fake news that does not take much computational time and varies widely. These attempts will provide a way to identify fake news applicable to variously changing fake news without requiring much computational time.

2. RELATED WORKS

Recently, interest in Artificial Intelligence technology has grown among the public. However, there seems to be not much research specifically on how Bigdata [1-11] is related to Artificial Intelligence [12-15] technology, and how it should be utilized. In this session, let's take a look at the relevance between Bigdata and Artificial Intelligence technology. In addition, let's look at Text Mining [16-23] using Artificial Intelligence technology.

2.1 Relations between Bigdata & Artificial Intelligence

Bigdata is needed to learn Artificial Intelligence algorithms. However, this argument does not fully explain why Artificial Intelligence technology is needed in Bigdata businesses. In addition, IT practitioners of most companies and organizations who are not familiar with Artificial Intelligence, especially machine learning, seem to perceive new insights that will help the organization just by collecting data into machine learning algorithms such as deep learning. If Artificial Intelligence algorithms are used well in Bigdata analysis, new insights that could not be found before can be obtained. This is when Artificial Intelligence algorithms are more common models than conventional analytical models and can be used effectively for exploratory data analysis in new parameter domains. In fact, it is not well known that much effort and trial and error are needed to produce useful results, although AI algorithms, especially deep learning and statistical machine learning, have been able to discover new drug substances that have not been found before. On the other hand, when Artificial Intelligence algorithms are useful for Bigdata analysis, they use human cognitive abilities to help observe and classify data or phenomena. As Artificial Intelligence algorithms and computing technologies develop, the cognitive function of the person needed can be somewhat automated through Artificial Intelligence and various Artificial Intelligence technologies in situations where they are simply repeated for special purposes. This automated cognitive capability allows data to be classified, processed and annotated much faster than humans, which can be useful for subsequent data processing processes that examine and classify large amounts of data, make decisions based on it, or link directly to business value.

In fact, Bigdata and Artificial Intelligence, which can have greater business effects in most organizations, are used to process and classify Bigdata using automated cognitive functions. If the classification and processing of data required in the analysis process is simple and repetitive cognitive tasks, the use of Artificial Intelligence technology reduces much of the time and effort required when performing the same task only on human power. This speed-up, simplification, and efficiency of the entire business process are more pronounced in Bigdata processing. However, when many companies think of Bigdata and Artificial Intelligence technologies, the reality seems to be that data analysis using Artificial Intelligence models first comes to mind rather than automation of data processing and classification processes. I think this is because the discussion on the use of Bigdata in Korea began as an extension of Business Intelligence. It will take a long time to analyze the data and apply the results to the business and see the effect. First of all, the process of collecting and processing data requires time and effort, and when approached by exploratory data analysis first, it takes a lot of time to explore and find the usefulness of the data and create the processing process. Even if data analysis gains useful business insights and value, it takes time and effort again to apply and reflect them to the real business. As a better approximate model for complex phenomena, Artificial Intelligence algorithms are also less useful to the business as they have the disadvantage of being more complex in interpretation and difficult to prove their utility than general deterministic or statistical models. If Artificial Intelligence technology automates parts that require human cognitive skills in data processing and processing to speed up the end-to-end processing of the entire process, it can quickly see the business effectiveness of Artificial Intelligence

technology if it starts with an early risk detection and response approach. It is necessary to change perspective by using Artificial Intelligence technology as a tool for automation.

Artificial Intelligence has more data following the same model, the more accurate the learned model is. Of course, too much data can lead to overfitting during the learning process and thus learn the wrong model parameters, but usually there should be enough data to learn the model. Bigdata collection technology helps collect data for this Artificial Intelligence. Artificial Intelligence requires twice as much data as general statistical intelligence. There will be an interesting phenomenon in which Bigdata is needed again to learn Artificial Intelligence to be used for Bigdata analysis. For this reason, it is no accident that successful companies using Artificial Intelligence for their services or products are Internet service providers such as Google and Facebook, which can easily collect Bigdata. Recently, Artificial Intelligence has been found to be almost completely capable of modeling cognitive functions in the early stages of human information processing. When Artificial Intelligence is used in data classification and processing processes that require cognitive functions such as image recognition and voice recognition, it can effectively automate Bigdata processing and processing processes. In the case of Artificial Intelligence, Bigdata must first be used to learn models accurately, and once learned models can be used for automation in the classification and processing of Bigdata again, with considerable accuracy in automating the Bigdata classification and processing process. This characteristic of Artificial Intelligence is becoming a unique competitive edge for companies with Bigdata, and it is widening the gap in business capabilities with other organizations by creating a virtuous cycle of intelligent services using deep learning models learned using Bigdata. As Artificial Intelligence has recently attracted a lot of attention in the IT technology industry, interest in Artificial Intelligence technology has grown. With this interest, many people seem to know that deep learning-based Artificial Intelligence technology is effective when Bigdata is used well. However, not many media specifically communicate specific methods on how Artificial Intelligence technology is related to Bigdata and how it should be utilized.

2.2 Text Mining

It is estimated that more than 80% of the world's data is unstructured in today's world where Bigdata is overflowing. Among them, text is the most basic and wide-ranging unstructured data. The process of analyzing and processing meaningful information for a particular purpose using academic knowledge such as linguistics, mathematics, statistics, and computer science is called Text Mining. Although Text Mining is now in the spotlight as a technology that opens a new era in Bigdata, the academic knowledge used has actually been active since the 1970s, and can be said to have a history of about half a century. Text is intractable data. It points out that text is full of ambiguous and abstract words, concepts change with context, and that there are various ways to express similar concepts (synonyms) and that each word has a high dimension that is difficult to process from a statistical perspective. It is difficult to visualize key features analyzed. It can be understood that multidisciplinary studies have been conducted for decades to formulate ways of uncovering the core meaning of text with these difficult features. How do industries that need to deal with data in real time and deliver high quality analysis results leverage these technologies? In fact, it is difficult to generalize the empirical view of the 'industry' because its level and performance vary widely depending on the actor (company, researcher).

Natural language processing itself is often misinterpreted as processing for analysis of complex data. Natural Language Processing is the leading process in Text Mining, which leads to data pretreatment, processing, analysis, and interpretation. Vector spatial models, concurrent words, and topic modeling are like very coarse sieves, extracting only approximate features from the sand of complex texts. In itself, it is difficult to find insight beyond common sense and experience in the real world. In addition, emotional analysis, semantic network analysis, and machine learning have much room for more sophisticated development as they fuse together. However, the size of Bigdata does not automatically solve the problem of methodology. New theoretical assumptions and methodological considerations are needed. In the same context, machine learning also requires methodological abstraction and accumulation of data tests for better supervision. In our experience, the process of refining early seed data for learning Artificial Intelligence and applying human insights and assumptions to get feedback determines the quality of machine learning and its analytical value

in real fields.

3. THE MODEL OF FACT-CHECKING GUIDELINE

The purpose of this study is to provide a misleading news discrimination system that allows users to immediately tell whether they are misleading articles without having to wait. Another purpose is to provide a method of identifying misleading news that allows users to immediately tell if they are misleading articles without having to wait.

3.1 Architecture of the Proposed System

Figure 1 shows the conceptual diagram of our proposed model for fake news identification system using fact-checking guidelines. The system of our proposed model consists of two major parts, one is news monitoring device and the other is fake news identification device. The latter one refers to fact-checking guideline model as well as news maker profile database. The resource of input data comprises several SNS, shareholder, comments, and so on.

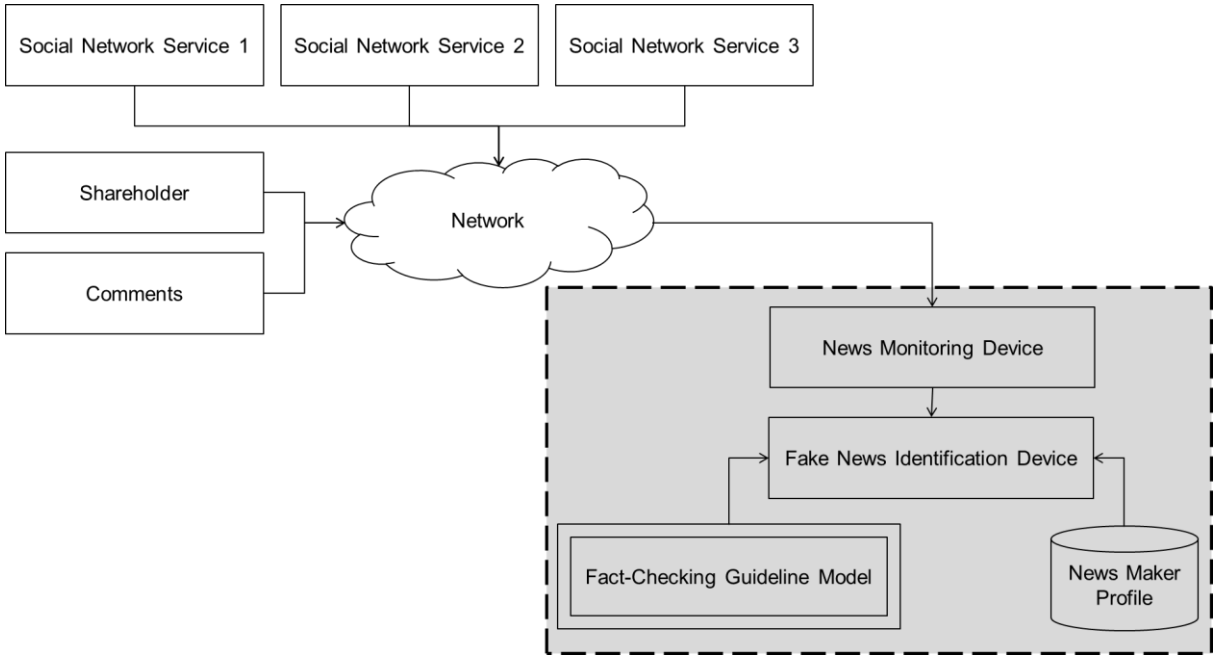

Figure 1. Architecture of the system

3.2 Notion of the Proposed System

This study includes a fact-checking guideline model based on pattern analysis against fake news and real news data, a news monitoring device that monitors news articles shared on SNS sites, and a fact-checking guideline model to determine the authenticity of news articles. Here, the fake news identifier performs a natural language processing for suspicious news articles, a fact-checking guideline model based on the results of the natural language processing for suspicious news articles, a fact-checking target acquisition, and a fact-checking target classified according to the type. The fact-checking performance section also includes a source display verification module that verifies whether the source of a check target is displayed within a suspected news article, and a source reliability verification module that validates the reliability information from the model according to weight by type. The fact-checking performance section also includes a forbidden word verification module that searches a database of banned word words when the type of the fact-checking target is a forbidden word, and an exceptionally permitted verification module that checks whether the fact-checking

target is a forbidden word.

The banned word also includes at least one of privacy violations, slang, advertising phrases and biased expressions, and human rights violations. In addition, it includes more news producer profile databases that store reliability information about news producers and their reporters, and fake news discriminators include more producer reliability assessments that give producer reliability scores based on the reliability information obtained from the news producer profile database, and fake news judgements based on fact-checking results. Our study monitors news articles shared on SNS sites, where user responses to news articles exceed certain thresholds, first-share acquisitions, first-share postings, and news articles' comments analyze news articles' intent to evaluate news sharing's credibility, latest results and suspicious results.

The share confidence assessment section is characterized by analyzing the share opinion posted by the first share and calculating the first share confidence assessment according to the frequency at which the share opinion contains expressions suggesting, encouraging, provoking, or misleading fake news. This section is also characterized by analyzing comments in news articles that contain comments directed at the first share, resulting in a second share confidence assessment based on the frequency at which negative or positive expressions are included. The latest assessment is characterized by analyzing the time difference between the date of writing or posting news articles and the date of sharing news articles, and determining the latest information based on the time difference. In addition, this study analyzes the intention of the first shareholder of a news article to select a suspected news article based on analysis results, natural language processing steps for fake news and fake news data, and fact-checking targets in a news article based on pattern analysis. It provides a fake news identification method using the fact-checking guidelines, which includes the steps of acquiring king targets, weighting them according to a predetermined method, and determining whether a suspected news article is fake based on the fact-checking results. The steps to perform fact-checking include verifying the reliability of the source by applying the method specified by the model according to the weight of the type in the suspected news article, if the type of fact-checking target corresponds to at least one of the quotes, findings, or numbers or statistics. The steps to perform fact-checking include searching the database of banned words for the type of fact-checking target to determine if the word is banned, and if the fact-checking target is identified as a banned word, checking whether it is used in accordance with the exceptional acceptance rules of the banned word. Banned words include at least one of privacy violations, slang, advertising phrases and biased expressions, and human rights violations. In addition, it further includes a producer reliability assessment step that gives a producer reliability score based on the reliability information obtained from the news producer profile database, where the reporter and his/her reporter are stored, and determines whether the news article is fake based on the producer reliability assessment and fact-checking results.

The Suspicious News article selection phase monitors news articles shared on SNS sites, tracks and obtains news articles' first-time shareholders when their responses exceed certain thresholds, analyzes news articles' comments posted by the first-time sharers to assess news articles' reliability, and calculates news articles' latest results. The step of evaluating the reliability of news shares is characterized by analyzing the share opinion posted by the first share and calculating the first share reliability evaluation value depending on how often the share opinion contains expressions suggesting, encouraging, provoking, or misleading fake news. The share confidence assessment section is also characterized by analyzing comments in news articles that contain comments directed at the first share, resulting in a second share confidence assessment based on the frequency at which negative or positive expressions are included. Also, the phase of determining the newness is characterized by analyzing the time difference between the date of writing news articles, posting news articles, and sharing news articles, and judging the latest based on the time difference.

4. THE DESIGN OF FACT-CHECKING GUIDELINE

The fake news identification system, using the fact-checking guidelines proposed in this study, monitors news articles shared by users on SNS sites, analyzes the intention of news sharing by the first news share, and analyzes suspected news articles based on the fact-checking guidelines to determine whether they are fake news. Furthermore, referring to Figure. 1, a fake news identification system using the fact-checking guidelines in accordance with an embodiment of this study can consist of a fact-checking guideline model, a news

monitoring device, a fake news identification device, and a news producer profile database. The fact-checking guideline model is modeled to determine the fact-checking targets within news articles based on pattern analysis results of fake news and real news data. A news monitoring device can monitor news articles shared on SNS sites and select suspected news articles based on the results of the news article's sharing reliability analysis and deliver them to a fake news identification device. For example, sharing reliability can be evaluated by analyzing the intention of the initial shareholder and by analyzing comments on shared articles. Details will be given later. Fake news identifiers can analyze suspected news articles selected from news monitoring devices and apply a fact-checking guideline model to determine the authenticity of suspected news articles.

News monitoring devices are block diagrams that show the configuration of news monitoring devices according to an embodiment of this study. News monitoring devices in accordance with an embodiment of this study can consist of the initial shareholder tracking portion, the share confidence evaluation portion, the latest determination portion, and the suspected index calculation portion. The initial share tracking portion monitors news articles shared on SNS sites, allowing users to track the initial shareholders of news articles if their responses to news articles that are shared exceed a certain thresholds For example, you can analyze the expression of empathy for news articles shared on SNS sites such as Facebook, Twitter, and Kakao Story (for example, good, amazing, etc.), comments, re-shares, tweets/retweets, and track who first shared news articles.

The share reliability assessment section analyzes the comments posted by the first shareholder and the news articles shared, identifying the intention of the first shareholder to evaluate the reliability of the news share. In other words, the share confidence assessment section can analyze the share opinion posted by the first shareholder, yielding the first share confidence assessment value depending on the frequency at which the share opinion contains expressions suggesting, encouraging, provoking, or misleading fake news. In addition, this part analyzes comments containing comments directed at the first share of news articles) to calculate the second shared confidence evaluation value according to the frequency with which negative or positive expressions are included to evaluate the reliability of news sharing based on the first and second shared confidence evaluations. For example, a typical user who shares news on SNS may intend to share and empathize with many people if the tone or content of the news article is consistent with their political, economic, cultural, professional interests or beliefs. Therefore, shared opinions may include some excerpts of the content of the article or their subjective opinions on the content of the article. Comments on these articles may also include expressions of opinion on the content of the article. These well-intentioned shares can appreciate the reliability of news sharing. On the other hand, not many people may want to share news articles that don't fit their tendencies or are suspected to be fake news, but if users share it as a warning even though they know it's fake news, they may be more aware of their intentions. In this case, the credibility of news sharing can be appreciated significantly lower because the user's opinion may indicate that it is fake news. Unlike the above case, there may not be a phrase suggesting fake news within a shared opinion if it is only to mislead facts or to create a particular public opinion. However, it can contain primary or provocative phrases and include expressions that encourage the spread of the news article. Comments about this may include comments such as criticism or encouragement of first-time shareholders or news writers. Such malicious sharing can be undervalued for the reliability of news sharing.

The update assessment section can determine the update of news articles based on the creation date of shared news articles. In other words, if you share news that has already been written or posted a long time ago (a few years ago, or months ago) and thus has no value as news, you can suspect it as fake news to mislead public opinion. Thus, the time difference between the creation date of a news article or the posting date of a news article and the sharing date of a news article is analyzed, and the greater the time difference, the lower the news article is. The suspect index calculation part can produce a suspect index for news articles based on the results of the shared confidence assessment and the results of the latest assessment. The lower the share confidence and up-to-date, the higher the suspect index can be produced, and if the calculated suspect index exceeds a certain threshold, it can be delivered to a fake news evaluation device to determine whether the news article is fake.

5. CONCLUSIONS

In this study, we propose news article identification methods with fact-checking guideline on Artificial Intelligence & Bigdata. Using the fact-checking guidelines in accordance with this study makes it easier to identify suspected news. Using fake news discrimination systems and methods, news articles whose user responses exceed a certain threshold are automatically selected while monitoring SNS, and it is very easy to analyze the sharing intentions and user responses of the first share of news articles. This model is followed by a secondary filtering process in which the analysis targets are primarily filtered, the fact-checking guideline model generated by Bigdata analysis is applied to select the fact-checking target sentence, and then our model for fact-checking guideline presented in the fact-checking guideline model for the fact-checking target. In addition, the model will be able to identify fake news quickly and accurately through subsequent three-step filtering.

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