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PREDICTION OF POLITICAL SECURITY THREAT USING ML

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Abstract

The internet offers a powerful medium for expressing opinions, emotions and ideas, using online platforms supported by Smartphone usage and high internet penetration. Monitoring online sentiments or opinions is important for detecting any excessive emotions triggered by citizens which can lead to unintended consequences and threats to national security. Mining opinions according to the national security domain is a relevant research topic that must be enhanced. Mechanisms and techniques that can mine opinions in the aspect of political security require significant improvements to obtain optimum results. We proposes a new theoretical framework for predicting political security threats using a hybrid technique: the combination of lexicon-based approach and machine learning in cyberspace. The proposed framework uses Decision Tree, Naive Bayes, and Support Vector Machine as threat classifiers. To validate our proposed framework, an experimental analysis is accomplished. The framework reveals that the hybrid Lexicon-based approach with the Decision Tree classifier recorded the highest performance score for predicting political security threats. Natural Language Processing (NLP) can be applied in opinion mining. As extension we have experimented with Random Forest and its giving more accuracy compare to propose algorithms. Random Forest will utilize forest or group of trees to optimize dataset features and this features optimization helps Random Forest in Yielding better accuracy.

INTRODUCTION

Cyberspace has become an important paradigm in the national security domain. According to the Worldwide Threat Assessment of the US Intelligence Community (2016), cyber-related threats are among the prominent threats in line with terrorism, the proliferation of weapons of mass destruction and counter intelligence. Securing a country is more complicated in modern times compared to previous decades. In this era, big data, massive information, online rumors and fake news are constantly shared in cyberspace. This can evoke negative emotions and disruptive behavior, which may jeopardize national security Researchers have found that a strong relationship exists between opinions or sentiments triggered by emotions and national security threats. It was further noted that

sentiments, also known as opinions, included in a text can provoke negative feelings or elicit emotions such as rage or fear which can trigger events that threaten national security. Various gaps, techniques and domain applications that focus on existing opinion mining methods can be used to determine the existing sentiments embedded in sentences throughout several domains.

LITERATURE SURVEY

Opinion mining for national security: Techniques, domain applications, challenges and research opportunities:

Background Opinion mining, or sentiment analysis, is a field in Natural Language Processing (NLP). It extracts people's thoughts, including assessments, attitudes, and emotions toward individuals, topics, and events. The task is technically challenging but incredibly useful. With the explosive growth of the digital platform in cyberspace, such as blogs and social networks, individuals and organizations are increasingly utilizing public opinion for their decision-making. In recent years, significant research concerning mining people's sentiments based on text in cyberspace using opinion mining has been explored. Researchers have applied numerous opinions mining techniques, including machine learning and lexicon-based approach to analyse and classify people's sentiments based on a text and discuss the existing gap. Thus, it creates a research opportunity for other researchers to investigate and propose improved methods and new domain applications to fill the gap. Methods In this paper, a structured literature review has been done by considering 122 articles to examine all relevant research accomplished in the field of opinion mining application and the suggested

Kansei approach to solve the challenges that occur in mining sentiments based on text in cyberspace. Five different platforms database were systematically searched between

This study analyses various techniques of opinion mining as well as the Kansei approach that will help to enhance techniques in mining people's sentiment and emotion in cyberspace. Most of the study addressed methods including machine learning, lexicon-based approach, hybrid approach, and Kansei approach in mining the sentiment and emotion based on text. The possible societal impacts of the current opinion mining technique, including machine learning and the Kansei approach, along with major trends and challenges, are highlighted. Conclusion Various applications of opinion mining techniques in mining people's sentiment and emotion according to the objective of the research, used method, dataset, summarized in this study. This study serves as atheoretical analysis of the opinion mining method complemented by the Kansei approach in classifying people's sentiments based on text in cyberspace. Kansei approach can measure people's impressions using artefacts based on

senses including sight, feeling and cognition reported precise results for the assessment of human emotion. Therefore, this research suggests that the Kansei approach should be a complementary factor including in the development of a dictionary focusing on emotion in the national security domain. Also, this theoretical analysis will act as a reference to researchers regarding the Kansei approach as one of the techniques to improve hybrid approaches in opinion mining

Sentiment analysis methods and approach: Survey

Nowadays, social media present a valuable source for business decision support and Data Analytics is widely used in many industries and organization to make a better Business decision. By applying analytics to the data the enterprises brings a great change in their way of planning and decision making. Sentiment analysis or opinion mining plays a significant role in our daily decision making process. These decisions may range from purchasing a product such as mobile phone to reviewing the movie to making investments all the decisions will have a huge impact on the daily life. Sentiment Analysis or Opinion analysis is performed to identify the opinion of peoples.It can be performed using Lexicon Based approach or Machine Learning based approach. Some methods are still not efficient in extracting the sentiment features from the given content of text. Naive Bayes, Support Vector Machine are the machine learning algorithms used for sentiment analysis which has only a limited sentiment classification category ranging between positive and negative. Even though the advancement in sentiment Analysis technique there are various issues still to be noticed and make the analysis not accurately and efficiently. So this paper presents the survey on various sentiment Analysis Methodologies and approaches. This will be helpful to earn clear knowledge about sentiment analysis methodologies.

EXISTING SYSTEM

to analyze the sentiment polarity of Twitter posts using a machine learning method for text categorization called Bayesian Logistic Regression (BLR) Classification. Their aim is to determine whether a tweet expresses a positive or negative sentiment towards a given topic. They also focuses on building a trained model to accomplish this task and to look for correlations between Twitter sentiment and major events, using the FIFA World Cup 2014 as a case study. They used Twitter Streaming API and official World Cup hash tags to mine, filter, and process tweets in order to analyze the reflection of public sentiment towards unexpected events.

In another research they introduced a lexicon-based approach for sentiment analysis of news articles. They have performed experiments on a BBC news dataset to validate the applicability of their approach.

Disadvantages:

 The existing work uses Bayesian Logistic Regression for text categorization, but it may not fully capture the emotional aspect of the sentiments expressed in tweets. The lack of emotional analysis might limit the depth and accuracy of the results.

 This approach may lead to biased or incomplete data representation, as not all tweets related to the event might use the designated hash tags.

 The existing work is specifically designed for sentiment analysis on Twitter. While Twitter is a popular platform for real-time updates and public opinions, its 280-character limit and informal language might limit the depth and context of the sentiments expressed.

 The existing work, which is using a lexicon-based approach for sentiment analysis, is its limited capability to handle context and sarcasm effectively.

PROPOSED SYSTEM

We proposes a new theoretical framework for predicting political security threats using a hybrid technique: the combination of lexicon-based approach and machine learning in cyberspace which are highly related to emotions embedded within the text of online news. The scope of this research is political security which is a key element of national security. The proposed framework is validated by experimental analysis using the hybrid technique in mining people's sentiments or opinions, which also includes the emotional aspect of political security. This is accomplished using a combination of the lexicon-based approach and machine learning techniques which are Decision Tree, Naïve Bayes and Support Vector Machine. We also measured the performance, accuracy and precision of each hybrid method involved in the experiments by using different machine learning techniques. Text data was gathered from online news platforms for conducting the experiments.

Advantages:

 Our work gathers data from online news platforms, which might provide a more comprehensive and diverse dataset.

 Our work focuses on online news platforms, which generally provide more extensive and detailed information.

 This hybrid approach is likely to enhance the accuracy and robustness of the predictions compared to the single-method approach.

 Our hybrid technique, which combines a lexicon-based approach with machine learning, might offer improved performance, as machine learning algorithms can better adapt to different contexts and learn from data to capture the complexity of language used in online news articles related to political security

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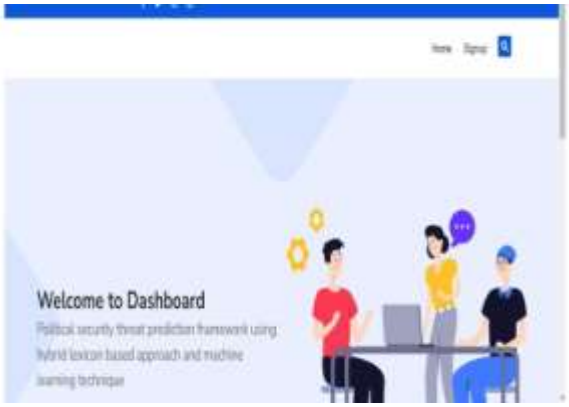
IMPLEMENTATION

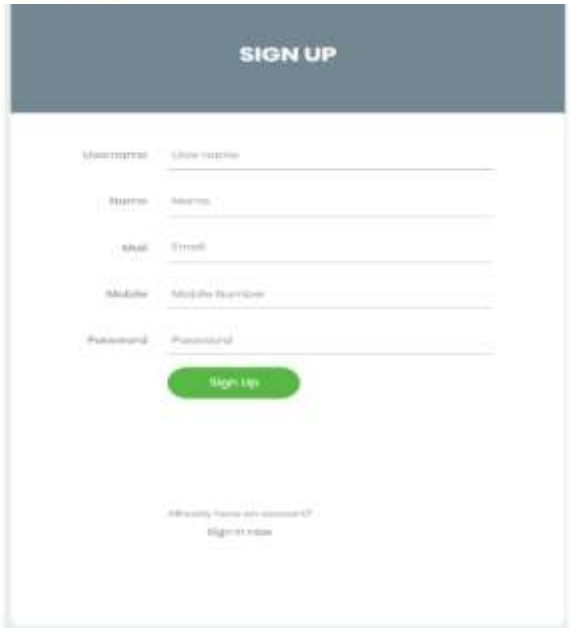
work-flows performed by the system and other business or compliance requirement the system must meet. Functional requirements specify which output file should be produced from the given file they describe the relationship between the input and output of the system, for each functional requirement a detailed description of all data inputs and their source and the range of valid inputs must be specified.

The functional specification describes what the system must do, how the system does it is described in the design specification. If a user requirement specification was written, all requirements outlined in the user requirements specifications should be addressed in the

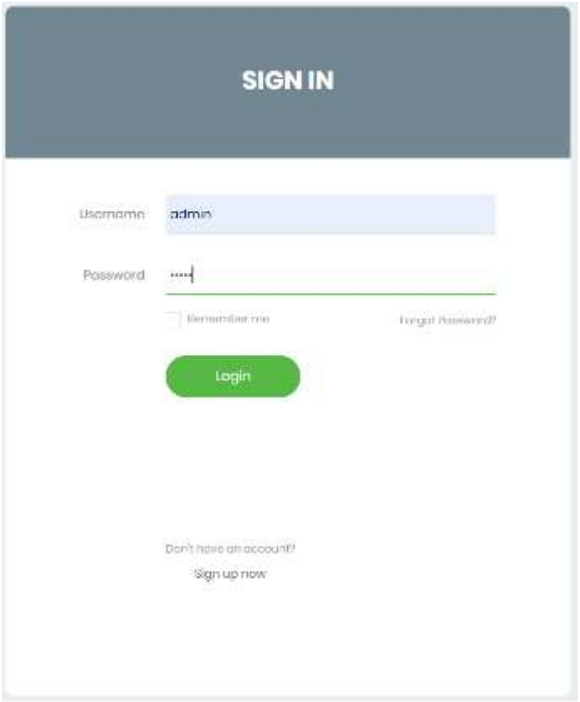
- Data Collection
- Data Preprocessing
- Training and Testing
- Modeling
- Predicting

RESULTS





New Registration



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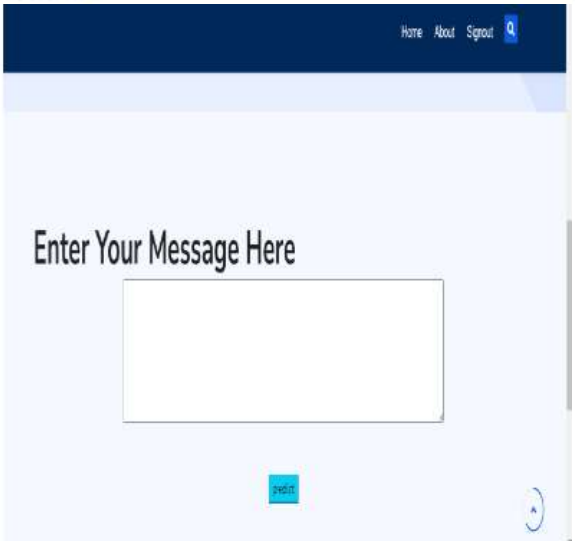

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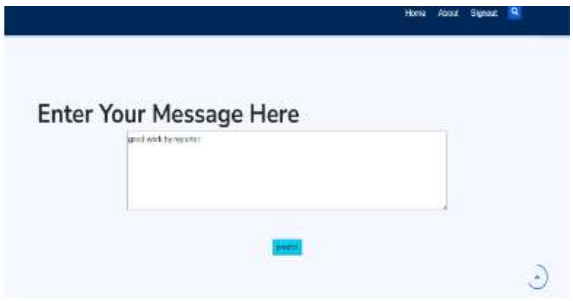
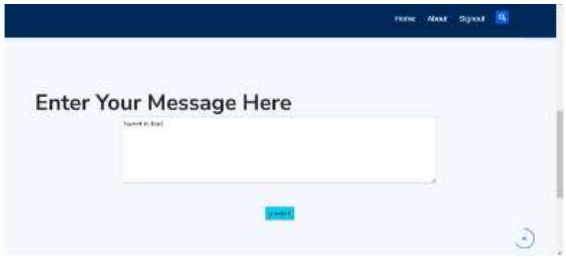
Prediction is negative

Prediction is neutral



Prediction is positive



CONCLUSION

Predicting political security threats using a hybrid approach of lexicon-based analysis and machine learning techniques are designed to analyze people's opinions on the national security domain, with a specific focus on the political security element. We aims to enhance opinion mining in the national security domain, and it includes opinion mining and national security elements specific to political security to create a multi-research domain study. We successfully demonstrated the relationship between emotions, opinions, sentiment, and political security threats in cyberspace. We presents a new theoretical framework that utilizes the lexicon-based approach and machine learning for the emotional assessment of text in

the national security domain, specifically for the political security element. We concludes that the combination of the lexicon-based approach with the decision tree classifier is the best hybrid approach method for detecting political security threats based on emotions embedded within online news text. As future work, a performance analysis of the proposed method using a massive dataset for this method will be conducted.

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