International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 06, 2020
ISSN: 1475-7192

Sentiment Analysis : A Review

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Abstract:

Authors' views on certain items are discovered using the process of sentiment analysis (also known as opinion mining). It is the views created by thought leaders and ordinary people that have an impact on the decision-making process of individuals. The majority of the time, when someone wants to buy something online, they will start by looking for reviews and comments posted by other people about the various options. One of the trendiest study fields in computer science nowadays is sentiment analysis (also known as emotional computing). The subject has been the subject of more than 7,000 articles. Sentiment analysis solutions are being developed by hundreds of startups, and major statistical programs such as sas and spss contain sentiment analysis modules as standard features. Today, there is a massive expansion of sentiments accessible through social media platforms such as twitter, Facebook, message boards, blogs, and user forums, among others. The information included in these bits of text is a gold mine for businesses and people who wish to monitor their reputation and receive quick feedback on their products and conduct.

Keywords: Sentiment analysis, deep-learning, algorithms, sentiment lexicon

Introduction:

Sentiment analysis gives these businesses the ability to track the many social media platforms in real-time and react to client comments as necessary. Sentiment analysis technology, employed by campaign managers, public relations firms, marketing managers, and politicians, directly benefits customers, equity investors, and internet shoppers. Sentences are commonly classified into two kinds with regard to subjectivity: objective sentences, which contain factual information, and subjective sentences, which contain explicit opinions, beliefs, and perspectives on particular entities. Sentences that are objective contain facts, while sentences that are subjective express overt ideas, convictions, and viewpoints regarding particular subjects. Interpreting subjective phrases is the main focus most of the time. Instead, what's being discussed here is the usage of objective language when talking about a sentiment application for stock selection. Here is a review of an application that can be found on the google play store as an example. "The application reacts quite quickly and has a lovely design. There were no issues, malfunctions, or failures to document. Its relative size in relation to alternative possibilities is the only drawback. The reviewers gave the application a very positive reaction overall. This phrase encompasses a wide range of organize elements, such as the front end, bugs, file size, and response time. Systems for assessing sentiment must be able to both review the sentiment of each individual component of the application that is being considered and generate a sentiment score for the overall review. The article outlines the fundamental difficulties in sentiment analysis as well as some of the solutions that have been created to deal with these issues. After that, it discusses a few of the main fields that sentiment analysis is now being used in. A few open research issues in the field could be mentioned to wrap this down. This work will not be able to address the whole range of topics and techniques due to the author's competence constraints. The present study addresses five distinct challenges related to the field of sentiment analysis.

Literature review:

Sentiment analysis, or opinion mining, is a vibrant and constantly developing area of natural language processing. In the current digital era, decision-making processes are greatly influenced by the opinions of both thought leaders and regular people. When people are thinking about making an online purchase, they usually look for customer reviews and comments about their experiences with different products and services. As a result, sentiment analysis—also known as emotional computing—has emerged as one of computer science's most popular research topics, appearing in over 7,000 academic publications. The fact that there are so many startups creating sentiment analysis solutions is proof positive that sentiment analysis is being used widely. Furthermore, sentiment analysis modules are now included as regular features in well-known statistical applications like sas and spss. Sentiment sources abound on social media sites including Facebook, twitter, blogs, message boards, and user forums.

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The data incorporated in these passages of text is an invaluable tool for companies and people who want to keep an eye on their image, get quick feedback, and make well-informed choices regarding their offerings and nature. The noteworthy increase of sentiment analysis can be ascribed to its exceptional abilities and adaptability. It is essential in filling in the gaps between the massive amount of textual material that is readily accessible online and insightful information that may direct people and a range of industries.

Methodologies and applications in the field of sentiment analysis have advanced significantly in the last few years. The incorporation of deep learning methods is one significant advancement. Sentiment analysis has undergone a revolution because to deep learning, namely neural networks, which enable models to automatically discover complex patterns in text data. Improved sentiment categorization has been made possible by the extraordinary abilities of recurrent neural networks (rnns) and, more significantly, long short-term memory (lstm) networks to capture the sequential dependencies in textual input.

Sentiment analysis has made significant strides in the use of algorithms, and a number of machine learning approaches are becoming well-known. The effectiveness of support vector machines (svm), naive bayes, and random forest in processing intricate text input and generating precise sentiment predictions has been demonstrated. Moreover, combining these methods with deep learning models has demonstrated the ability to greatly improve sentiment analysis precision. The creation of sentiment is another essential component. These lexicons are carefully selected lists of terms and expressions connected to particular emotions. The limited number of sentiment lexicons that are now accessible, despite their demonstrated efficacy, may prevent them from fully covering the range of sentiment expressions in diverse circumstances.

In conclusion, the evaluation of the literature highlight how dynamic sentiment analysis is in the current digital environment. The field is at the forefront of natural language processing thanks to the incorporation of deep learning techniques, the development of algorithms, and the continuous investigation of lexicons and hybrid models. Sentiment analysis has the potential to provide ever-deeper insights into the attitudes and sentiments that influence our digital world as new methods and problems are solved. The discipline of sentiment analysis in computer science is always relevant and developing due to its wide range of potential applications in political analysis, customer feedback, marketing, and other areas.

Semantic analysis at comparative perspective: on many occasions, people do not express a direct opinion regarding a particular product, but instead share comparable opinions, such as the following phrases taken from the edmonds.com user forums: "the 300-c touring has a far more appealing appearance than the magnum," says the author. During my test drive of the Honda civic, i discovered that it does not handle any better than the tsx. When applied to this situation, the purpose of the sentiment analysis system is to detect the phrases that include comparison opinions and to extract the preferred entity in each opinion from the sentences. Jindal and liu's study on comparative sentiment analysis is considered to be one of the pioneering studies in the field. According to the findings of this research, we can cover 98 percent of all comparison perspectives by utilizing a very minimal range of words.

Components/description:

The goal of this part is to break down the basic ideas and practices the underpin semantic analysis. We can discover a lot about how computers understand and produce meaning from human language.

Natural language comprehension: semantic analysis is built upon natural language comprehension. This part enables tools and technologies to understand and translate human language.

word embeddings: using word embedding is important component of semantic analysis. It takes contextual meanings and translate them into numerical vectors.

semantic roles: a key component of semantic analysis is comprehending the functions that words perform inside a sentence or text. This section breaks out the connections between words and how they function to transmit meaning. It explores the identification of verbs, things, and modifiers, which enhances the reader's ability to understand the text as a whole.

information graphs: a structured, organized information base is represented as a knowledge graph. Through the incorporation of knowledge graphs into semantic analysis, machines are able to access vast amounts of external knowledge. By linking concepts, these graphs improve language comprehension by relating language to knowledge.

We enable readers to understand the inner workings of semantic analysis and to appreciate the mechanisms that underlie language comprehension by illuminating these fundamental elements. This thorough comprehension provides the foundation for investigating the real-world uses of semantic analysis in a variety of fields, such as sentiment analysis, which was covered in the part before this one.

Working:

By shedding light on important parts, we help users to comprehend the inner workings of semantic analysis in several area, including sentiment analysis.

The working section investigates the applications and real-world uses of semantic analysis. Here, the ideas and applications of semantic analysis are used to produce physical results and solutions across a range of industries. The features and practical applications of semantic analysis are covered in detail in this section. Machines can now comprehend, review, and produce human language thanks to the foundational applications of semantic analysis. Let's examine some of the operational details in more detail:

information retrieval: information retrieval systems are one of the main areas where semantic analysis is applied. Semantic analysis is a technique used by search engines like google to translate the meaning behind a user's issues. These systems improve the user's search experience by retrieving common search results by understanding the meaning of words and their context.

Sentiment analysis: a branch of semantic analysis that has become popular in the commercial sector is sentiment analysis. Businesses employ sentiment analysis to assess consumer feedback, social media sentiment, and public opinion.

These useful examples demonstrate the flexibility and practical implications of semantic analysis. Semantic analysis is at the heart of many technology advances, from bettering search results to improving consumer experiences and facilitating language translation. The upcoming section delves into the field's unexplored areas and future prospects, providing insight into the possible improvements that semantic analysis may bring.

Future scope:

The strategies work well when the whole article or each statement pertains to a single idea. On the other hand, in various situations, people are discussing things that have multiple characteristics, and they all have different aspects about each of those qualities. The same issue frequently occurs in discussion forums and product reviews that are specific to particular product categories. Consider the following kindle fire review, which was sourced from the amazon website: in reality, we had been suspecting for a while to get our hands on a fire. The device is fast and, for the most part, incredibly simple to use, among its many other great qualities. The screen is amazingly, offering an extremely wide viewing angle along with excellent brightness and color reproduction. Nevertheless, there are certain drawbacks, like the small bezel size that makes it difficult to handle without unintentionally rotating the page, the lack of buttons that complicates functions, and the limited quantity of accessible storage memory—just 5gb." we would be missing out on a great deal of crucial information if we were to classify this review of the kindle as either positive or negative. The author offers a lot of discussion on the kindle's objects, including buttons, bezel size, screen quality, speed, simplicity of use, and storage capacity size. Positive comments have been made about some of these components, while critical comments have been made about others. A research challenge known as "aspect-based sentiment analysis," or "feature-based sentiment analysis," focuses on identifying all sentiment expressions found in a given document along with the aspects to which they pertain. It is a portion of sentiment analysis based on features. Many commercial organizations use a standard technique for identifying all features in a corpus of product evaluations. This technique involves extracting all noun phrases (nps) and preserving only the nps whose frequency is greater than a threshold that has been empirically set.

Conclusion:

this article covered some of the most important research topics in the field of sentiment analysis and explored many algorithms that are designed to address each of these difficulties in some way. We have also discussed some of the most significant uses of sentiment analysis, as well as some of the most significant unresolved difficulties. Many commercial sentiment analysis systems continue to rely on rudimentary methodologies to avoid these open difficulties, and as a result, their performance leaves much to be desired. It is anticipated that providing appropriate answers to these issues would result in the field of sentiment analysis is much more ubiquitous.

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