Perspective

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Neural Networks and Biomedical Simulations

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Description

This study deals with the issue of greenwashing, i.e. the false portrayal of companies as environmentally friendly. The analysis focuses on the US metal industry, which is a major emission source of sulfur dioxide (SO2), one of the most harmful air pollutants. One way to monitor the distribution of atmospheric SO2 concentrations is through satellite data from the Sentinel-5P programme, which represents a major advance due to its unprecedented spatial resolution. In this paper, Sentinel-5P remote sensing data was combined with a plant-level firm database to investigate the relationship between the US metal industry and SO2 concentrations using a spatial regression analysis. Additionally, this study considered web text data, classifying companies based on their websites in order to depict their self-portrayal on the topic of sustainability. In doing so, we investigated the topic of greenwashing, i.e. whether or not a positive self-portrayal regarding sustainability is related to lower local SO2 concentrations.

Massive Data Mining

Our results indicated a general, positive correlation between the number of employees in the metal industry and local SO2 concentrations. The web-based analysis showed that only 8% of companies in the metal industry could be classified as engaged in sustainability based on their websites. The regression analyses indicated that these self-reported ”sustainable” companies had a weaker effect on local SO2 concentrations compared to their “non-sustainable” counterparts, which we interpreted as an indication of the absence of general greenwashing in the US metal industry. However, the large share of firms without a website and lack of specificity of the text classification model were limitations to our methodology. The current method generates a large number of candidate sets when mining data in mobile libraries under asymmetric information, and the mining time and efficiency are poor. To this end, a new method for mobile library massive data mining based on improved Apriori algorithm is proposed to collect, clean and reduce massive data. Calculate the reader's interest distance by analyzing the borrowed historical data, and use the Apriori algorithm to find the association rules in the frequent itemsets of the data. In order to make up for the shortcomings of the current method, while filtering out infrequent candidate sets, the corresponding transaction set is also collaboratively filtered, which can reduce the amount of calculation and time consumption. Experimental results show that the proposed method can mine more valuable rules. The improved execution time is only 10 s, the CPU utilization exceeds 90%, and the acceleration ratio exceeds 1.81 s, which can better meet the needs of decision makers. Electronic health records are gaining popularity to detect and propose interdisciplinary treatments for patients with similar medical histories, diagnoses, and outcomes.

These files are compiled by different nonexperts and expert clinicians. Data mining in these unstructured data is a transposable and sustainable methodology to search for patients presenting a high similitude of clinical features. In today’s information society, we witness an explosive growth of the amount of information becoming available in electronic form and stored in large databases. Data mining can help in discovering knowledge. Data mining can dig out valuable information from databases in approaching knowledge discovery and improving business intelligence. In this paper, we have discussed the involvement and effect of data mining techniques on relational database systems, and how its services are accessible in databases, which tool we require to use it, with its major pros and cons in various databases. Through all this discussion we have presented how database technology can be integrated to data mining techniques. The process of frequent itemset mining (FIM) within large-scale databases plays a significant part in many knowledge discovery tasks, where, however, potential privacy breaches are possible. Privacy preserving frequent itemset mining (PPFIM) has thus drawn increasing attention recently, where the ultimate goal is to hide sensitive frequent itemsets (SFIs) so as to leave no confidential knowledge uncovered in the resulting database. Nevertheless, the vast majority of the proposed methods for PPFIM were merely based on database perturbation, which may result in a significant loss of data utility in order to conceal all SFIs.

Data Mining

To alleviate this issue, this paper proposes a database reconstruction-based algorithm for PPFIM (DR-PPFIM) that can not only achieve a high degree of privacy but also afford a reasonable data utility. In DR-PPFIM, all SFIs with related frequent itemsets are first identified for removing in the pre-sanitize process by implementing a devised sanitize method.

With the remained frequent itemsets, a novel database reconstruction scheme is proposed to reconstruct an appropriate database, where the concepts of inverse frequent itemset mining (IFIM) and database extension are efficiently integrated. In this way, all SFIs are able to be hidden under the same mining threshold while maximizing the data utility of the synthetic database as much as possible. Moreover, we also develop a further hiding strategy in DR-PPFIM to further decrease the significance of SFIs with the purpose of reducing the risk of disclosing confidential knowledge. Extensive comparative experiments are conducted on real databases to demonstrate the superiority of DR-PPFIM in terms of maximizing the utility of data and resisting potential threats. Data mining is a technique that allows to obtain patterns or models from the gathered data. This technique is applied in all kind of environments such as in the biological field, educational and financial applications, industry, police, and political processes. Within data mining there are several techniques, among which are the induction of rules and decision trees which, according to various studies carried out, are among the most used. This research analyzes decision tree data mining techniques and induction rules to integrate several of its algorithms into PostgreSQL database management system (DBMS).

Through an experiment, it was found that when the algorithms are integrated to the manager, the response times and the results obtained are higher. New energy materials that act as clean power sources and data science are developing rapidly in the past decades and the advancement of the two research areas have significantly benefited the development of each other. At the meantime, structural information of materials have been obtained and stored in various structure databases, such as the Cambridge Structure Database (CSD) and the Inorganic Crystal Structure Database (ICSD). Researchers have developed various structure-property relationships of the energy materials, which could be applied to screen the potential suitable materials from structure databases; this has become an efficient route to explore and design new energy materials. In this article, we review recent progresses on the data mining study of new energy materials based on structure databases such as CSD and ICSD, in the context of dye-sensitized solar cells and perovskite solar cells, and also include other energy systems such as water splitting systems, lithium batteries, thermoelectric devices and gas adsorbent materials. The structure descriptors that are more fundamental in the data mining procedure employing the structure-properties relationships are focused; the structural descriptors are complementary to the quantum descriptors and are efficient in the materials design process. We believe that with the successful formulation of more advanced and case-by-case structure-property relationships of energy materials, many new energy materials could be efficiently identified with much lower cost and shorter design period via the data mining process. In recent years, data mining has become one of the most popular techniques for data owners to determine their strategies. Association rule mining is a data mining approach that is used widely in traditional databases and usually to find the positive association rules. However, there are some other challenging rule mining topics like data stream mining and negative association rule mining. Besides, organizations want to concentrate on their own business and outsource the rest of their work.