

Computer-Aided Clustering Analysis of Short-Term Interactive Data of Industry Microblog Marketing Effect and Number of Fans Based on Quantum Evolutionary Game Algorithm

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Abstract: An equilibrium reduction algorithm of attribute quantum game based on population mixed cooperative alliance is proposed. The algorithm establishes a population co-evolution alliance model based on adaptive multi-layer evolutionary tree, and realizes the co-evolution of various groups by the hybrid synergistic mechanism of individual competition within the population and elite cooperation among the population. According to the AISAS model, the influence of corporate microblog marketing. There are complex processes such as amplification and attenuation of power, and the number of followers of a company's Weibo is an important factor to measure the marketing effect. To study the quantitative relationship between the influence of corporate Weibo marketing and the number of fans, on the basis of collecting and sorting out the real data of 10 typical corporate Weibo marketing cases on Sina Weibo. In the analysis and processing, in the face of the rapidly increasing database, the phenomenon of "rich data, lack of knowledge" appears.

Keywords: Computer-Aided Clustering Analysis, Short-Term Interactive Data, Industry Microblog Marketing Effect, Quantum Evolutionary Game Algorithm

1. INTRODUCTION

In 1959, American scholars Lcdley et al. introduced mathematical models into clinical medicine for the first time, and proposed a computer-aided diagnosis (CAD) mathematical model, creating a precedent for CAD. At one time, people had high expectations for CAD, hoping to realize automated diagnosis with the help of computers [1]. From the launch of Sina Weibo in August 2009 to the beginning of 2011, the microblogging services of the four major portals have gradually matured, and the number of Weibo users in China has exceeded 200 million. The widespread use of Weibo in marketing is inseparable from the characteristics of Weibo itself [2].

Microblogging bridges the gap between blogs and instant messaging [3], enabling users' opinions to spread rapidly and information dissemination more effectively [4]. At the same time, Weibo also has low threshold and wide influence [5], which makes it easier to form a huge user group. The huge number of Weibo users makes Weibo an emerging marketing channel that enterprises cannot ignore, and how to conduct marketing and expand corporate brand influence through Weibo has become a hot topic at the forefront. Attribute reduction is an important part of rough set theory research, which refers to deleting irrelevant and redundant attributes in the decision table under the condition that the data classification ability in the decision table remains unchanged [6], and selecting the minimum attribute set, so that the knowledge representation in the decision table can be simplified and Without losing its important information [7-9].

Combined with the existing domestic and foreign literature on the research on microblog and microblog marketing, using the theory of consumer behavior, relationship marketing theory and interaction theory [8], it defines the related concepts of microblog interaction characteristics and relationship quality. Based on the definition of the concept, this paper analyzes the

relationship and interaction mechanism of Weibo marketing [9]. After researching the relevant references, it is concluded that the residents' health records are the normative records of the process of recording residents' physical and mental health status, and are in the whole life process of residents [10], with personal health as the core, adopting an information-based multi-channel method to dynamically collect personal related health data, and to meet the information resource platform of residents' personal health management and their own needs.

At present, the main forces of Weibo in the Chinese market are Sina Weibo, Tencent Weibo, Sohu Weibo and Netease Weibo. Time [11]. It can be said that China's corporate microblog marketing is still in a relatively primary stage of development, and related theoretical research, especially the theoretical research on the effect analysis of corporate microblog marketing, is still in the process of groping [12]. The spectrum allocation in cognitive radio mainly refers to Spectrum is allocated to one or more designated nodes according to the number of nodes that need to access the system and their service requirements.

The spectrum allocation in cognitive radio has many common characteristics with the spectrum allocation of other communication systems [13]. However, due to the characteristics of the cognitive radio itself borrowing the spectrum of authorized users, the algorithms such as Lemke-Howson based on the linear programming simplex solution are able to cope with the problem. A certain scale of Nash equilibrium is solved, and it has the ability to solve pure strategy and mixed strategy at the same time [14], but the calculation steps are quite complicated. The most important thing is that it is difficult to realize parallel computing, and the maximum utilization efficiency of computing resources is not high. Currently, we have entered the era of data [15].

Since about 2000, words such as "big data" and "data explosion" have become popular words in today's technology

field. The Internet Data Center in the United States has been monitoring the amount of Internet data. They pointed out that the data on the Internet is increasing at an annual rate of about 50%. Therefore, the total amount of data will double every two years. The data above the world is only generated in recent years [16].

However, the green building evaluation system is mainly aimed at above-ground buildings and their auxiliary parts. Due to the particularity and complexity of underground space, these evaluation and design indicators cannot be directly used in the green design and evaluation of underground space, such as underground space [17]. Compared with the above-ground building itself, it satisfies the index of land saving. For example, in the energy saving of above-ground buildings, in addition to considering the material of the envelope structure, the area ratio of the window and wall should also be considered.

2. THE PROPOSED METHODOLOGY

2.1 The Quantum Evolutionary Game Algorithm

Co-evolution Algorithm (CEA) has become a hotspot in intelligent evolutionary algorithm research by simulating and revealing co-evolutionary phenomena and processes of multiple groups in natural ecosystems [10, 11]. The degree of correlation and mutual division of labor, competition and cooperation, improve their performance through co-evolution, and highlight their strong advantages in solving NP-Hard problems [12, 13]. In the previous section we introduced the theoretical basis of game theory, which is an effective tool to help analyze decision-choice problems.

Cognitive radio, as a new generation of radio that can detect the available spectrum space and change its communication parameters to adapt to the radio environment for communication, involves the selection of strategies in many of its key technologies. The superposition of quantum states refers to more than one The information state is accumulated on the same microscopic particle, which originates from the "coherent superposition" in the wave nature of the microscopic particle. The superposition property of quantum states can be simply described as: if the quantum state of a quantum system can be any one of several different quantum states, then their normalized linear combination can also be its quantum state. This linear combination is called "superposition". Decision tree method (Decision Tree) is the process of classifying data through a series of rules.

Specifically, the mutual information (information gain) in information theory is used to find the attribute field with the largest amount of information in the database, and a node of the decision tree is established. Aiming at the above research problems, this paper studies the cooperative behavior and high efficiency that are more in line with the evolutionary laws of natural populations. According to the evolutionary mechanism of quantum game, according to the minimum attribute evolution reduction model, an equilibrium reduction algorithm of attribute quantum game (AERQG) based on population mixed cooperative alliance is proposed. The quantum game that has emerged in recent years is an attractive computational model in quantum computing, which simulates the process of game theory in a quantum way. In classical game theory, game participants are often required to be completely rational or even super-rational.

2.2 The Industry Weibo Marketing Effect and Number of Fans

As the five stages of AIDMA show a gradual decrease, the number of customers who eventually form real consumption through a large number of marketing activities is always a small number, which reveals that the effect of traditional corporate marketing activities tends to decline naturally over time, and the real marketing conversion rate is not high. This theory is generally recognized by the advertising and marketing industries. In the research on evaluating the effect of Weibo marketing, it is mainly divided into three categories: one, mainly for the evaluation indicators; One is to carry out quantitative evaluation; the third is to analyze and evaluate the methods of Weibo marketing.

As a new form of social media, Weibo is a new form of social media, and the research on the evaluation of social media marketing has laid the foundation for the evaluation of Weibo's marketing effect. Carrying out promotional activities is a commercial function of Weibo that many companies easily think of. If there are many target audiences of enterprises on Weibo, discounts, lottery draws, and free delivery can be put into Weibo. In Weibo, publishing this kind of information is not only low cost, but also can make good use of its sharing mechanism. The research on clustering algorithm mainly starts from two aspects: First, regarding the determination of the value, through the above analysis and research, The determination of the initial cluster center value has a profound impact on the entire clustering process and the final clustering result, but it is difficult to determine the value directly or at one time in practical applications.

This reveals that in the Internet era, after companies shift the focus of their marketing activities from enterprise-centric to consumer-centric, the marketing effect of enterprises is no longer a purely natural decline trend over time, but there is a natural decline trend, and because of Consumer's search. Therefore, the number of forwarding and commenting on microblogs of corporate activities can be used as a measure of activity coverage. In terms of the popularity of dissemination, the user's attitude towards the company's microblog can reflect the influence of the company's microblog [12], and the user's attitude towards the company's microblog or microblog activities can be shown from the user's comments. The layer evolution tree is an alliance model that integrates competition and cooperation and mixed co-evolution. The structure of the tree will start from an initial "fat tree", adjust layer by layer to a "thin tree", and eventually form a slave tree. A positive-order tree that increments from the root to each subtree node.

2.3 The Computer Aided Cluster Analysis of Short-Term Interaction Data

At present, in data mining algorithms, clustering plays an extremely important role in discovering data distribution and existing patterns in large data sets. How to improve and use traditional clustering algorithms to find useful information in large data sets has become increasingly more people's attention. The AISAS model simply and intuitively reflects the reality of corporate marketing in the Internet age, and is widely used in business practices.

Ritsuya[8] believes that the AISAS model has an important influence on the development of new media strategies of advertising companies, and suggests that advertising, marketing, public relations and other industries should speed up media innovation strategies. The decision-making unit DMU is defined as the microblog marketing activities of

major companies. Each DMU has 3 input variables: $X =$ (prize value, tweet frequency, reply volume), 3 output variables: $Y =$ (number of retweets, comments) number, the proportion of positive and negative reviews). The above comparison and exchange operations are carried out from the bottom of the tree to the top of the tree in a recursive manner in each divided evolutionary subtree. The fitness of the root node of each evolutionary subtree is always smaller than the fitness of its corresponding child nodes; the parallel implementation of the Nash equilibrium algorithm in this paper is largely beneficial to the parallelization of the basic operation module, and the large-scale application of matrix operations is also an algorithm Guarantee of efficient operation.

With the support of multi-GPU cluster technology, this paper further realizes such as matrix transposition. Clustering of high-dimensional data has always been a difficult point in clustering problems. The dataset has the property that it belongs to higher dimensional data. The algorithm also achieved good clustering results on this data set. Each index value is the highest among the three algorithms, and the recall rate is nearly a percentage point higher than that of the graph-based quantum game clustering algorithm, indicating that the algorithm in this paper is dealing with It has obvious advantages when dealing with high-dimensional data.

3. CONCLUSIONS

The purpose of this study is to explore how the number of followers plays an influential role in the short-term marketing process of corporate microblogs. By establishing a short-term interaction model between the marketing effect of corporate microblogs and the number of followers, the scope of application and economic significance of the model are discussed, and then combined with data envelopment analysis (DEA) method establishes an evaluation model for the marketing effect of corporate microblog activities, and evaluates the marketing effects of corporate microblog activities in a quantitative way. Through the empirical research on the official microblog of S enterprise, the microblog marketing activities of an enterprise microblog in different periods are analyzed, and the rationality and feasibility of the index system and model are verified.

4. REFERENCES

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