



## Computer-Aided Medical Analysis of Smart University Student's Psychological Fitness Data using Fuzzy Clustering and Decision Tree Algorithms

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**Abstract.** The strain that university students are under to succeed academically, emotionally, emotionally, and professionally is plainly growing as a direct result of the quickening pace of life and the intensifying level of competitiveness in society. Therefore, while dealing with issues such as studying, socializing, making new friends, and falling in love, it frequently results in furious clashes of psychological contradictions, which in turn results in an imbalance and an imbalance of psychological growth. The results of traditional clustering methods are clearly divided into "either or" categories, but as the volume of data continues to increase and its structure becomes more complex, the correlation between the data continues to strengthen, and an increasing number of data have a "either or" relationship. In this research, we investigate the use of Decision Tree Algorithms to perform a fuzzy cluster analysis on the psychological fitness data of university students. The system is able to readily identify university students who are having issues by analyzing aberrant data, and the decision tree algorithm is able to assist in determining the reasons for these issues. It is an intelligent analytical system that has the potential to be of considerable assistance to the mental health of university students.

**Key words:** Decision Tree Algorithms, University student, psychological fitness data, Fuzzy cluster analysis; Computer-Aided Medical Analysis

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### 1 INTRODUCTION

In recent years, harmful events that were caused by university students' mental issues have occurred frequently, and the health data status of university students has become the focus of the entire society. This is due to the fact that university students are a growing demographic in the United States. Experts from both the United States and other countries have conducted a significant amount of in-depth study on this topic and have actively investigated the psychological counseling

and intervention methods utilized by university students [19-8]. The results of traditional clustering methods are clearly divided into "either or" categories, but as the volume of data continues to increase and the complexity of its structure increases, the correlation between the data continues to strengthen, and an increasing number of data have a "either or" relationship [2]. Processing data of this nature requires the application of fuzzy mathematics, which is a specific type of mathematics. Fuzzy clustering analysis has a broad variety of applications in a variety of disciplines [6-25] due to the fact that it has the potential to be closer to the cognitive law of objective objects.

Finding the hidden regularity in a small amount of data of psychological fitness problems can be done by combining the analysis of mental problems with the Decision Tree Algorithms to study it. This is a good way to improve the scientificity of psychological fitness education in schools by utilizing more advanced intelligent means [9]. Similar to how we can analyze introversion and extroversion, emotions and calm alertness, timidity and courage, respectively, in order to know the distribution of each variable in the cluster, discover existing problems in a timely manner, and carry out targeted mental health education [17-16], we are able to analyze introversion and extroversion, emotions and calm alertness, and timidity and courage, respectively, in order to know the distribution of each variable. The approach that was used was not a greedy algorithm, and a series of local optimum decisions were used to construct decision tree classification data [12-23]. This was done so that the optimal decision tree could be found in a reasonable amount of time while maintaining a high level of accuracy.

In most cases, a change in one property may be inferred from the change in another attribute if the two attributes are completely connected to one another. Users are required to select a variety of parameters when using decision tree algorithms [21-22]. These parameters include the support and confidence of the findings, the number of clusters, and so on. The cluster analysis findings are quite sensitive to the values of these factors, which have a significant impact on those outcomes. Nevertheless, the setting of these parameters is frequently directly tied to the professional understanding of the sample itself; hence, it is difficult for regular users to set these parameters effectively. Because of this, a successful algorithm should have relatively low reliance on these parameters [5]. In addition, the features of students are rather stable, and they do not require real-time categorization. As a result, the problem of computation cannot be considered; thus, the Decision Tree Algorithm is more appropriate for application in the study of students' psychological fitness. [15]. This paper introduces data mining technology into the analysis of university student mental health symptoms, and it uses data mining tools to mine the relationships and main factors among the factors that lead to university student mental problems. The purpose of this is to discover the hidden rules and patterns that lie behind a large number of data, and to provide a more effective and scientific basis for the planning of an intervention. Additionally, this paper discusses the fundamental idea behind decision tree algorithms and some of the more common algorithms that are used in decision tree algorithms. [7].

The following is a list of the novelties introduced by this paper:

1. Within the scope of this article, the psychological fitness model diagram of decision tree algorithms will be constructed. The work of data preparation is broken down into several subtasks, including data selection, data cleaning, data synthesis, and data format. In order to guarantee that the quality of the data is maintained, it is required to preprocess the data. This is because there are numerous selected data, all of which are disorganized, repetitious, and incomplete. Analyze the data table and choose the characteristics that have comprehensive data when picking the factors that influence psychological symptoms. Some examples of such factors are gender, family income, being a single parent, and so on.

2. A fuzzy cluster analysis system for psychological fitness data is built, and it is based on decision tree algorithms. The client software of the fuzzy cluster analysis system of psychological

fitness data accomplishes the analysis of the evaluation results by utilizing the method of mental evaluation data mining (abbreviated as DM), processes the obtained user evaluation results data and establishes a database, and analyzes the evaluation results through the Decision Tree Algorithms in order to obtain an evaluation. The evaluation can then be used to determine the psychological fitness level of the individual.

This paper may be broken down into five distinct pieces that make up its general structure.

Following an overview of the historical context and current relevance of fuzzy clustering analysis of psychological fitness data, the first chapter of this article outlines the primary body of research that will be presented. The primary focus of the second chapter is an overview of the relevant work that has been done domestically and internationally on the fuzzy cluster analysis of psychological fitness data. The idea and underlying model of Decision Tree Algorithms are presented in the third chapter of this book. The implementation of a fuzzy cluster analysis system for the psychological fitness data of university students is shown in the fourth chapter, along with an analysis of the experimental component of the study. The whole content is condensed into the fifth chapter, which serves as a summary.

## **2 RELATED WORK**

### **2.1 Research Status at Home and Abroad**

Li L, et al. The mental health problems of university students have been highly valued by relevant units. The steady progress of public welfare undertakings, material is not the main reason for dropping out, but from mental health problems[13]. Yu S, et al. Illness will directly affect people's psychological state. Illness not only causes physical pain to people, but also has adverse effects on their emotions and spirits. In addition, there is a potential relationship between economic income, life satisfaction and the mental health of the elderly, and these factors have great influence on people's mental health[24]. Al-Turkait F A, et al. In the process of using the system, most teachers, counselors and mental health educators only add, delete and check data, and do not systematically analyze the data in the system. As a result, important data attributes have not been effectively applied, and an active early warning mechanism cannot be established, thus preventing problems before they happen[1]. Kor N, et al. In the process of using the system, most teachers, counselors and mental health educators only add, delete and check data, and do not systematically analyze the data in the system. As a result, important data attributes have not been effectively applied, and an active early warning mechanism cannot be established, thus preventing problems before they happen[11]. Lipson S K, et al. put forward that the current understanding of University student' psychological state depends on the intuitive reflection of the compulsory health test system, and the compulsory tutors are only limited to the addition, deletion and correction of data when using the compulsory health test system. Such test results are subjective to a certain extent, which can't fully and truly reflect University student' psychological state, and at the same time can't take the initiative to prevent and intervene students' mental issue [14]. Sajan P, et al. Pointed out that the number of students is increasing, and the psychological fitness education of University student is gradually paid attention to by major colleges and universities. Relevant software such as student management system and psychological test system to manage student information [20]. The traditional view that health is disease-free has gradually been abandoned. People tend to accept this view that mental health is relative and in a state of hierarchical difference, rather than perfect Qiang. Mental health refers to the sustained mental state for a long period of time, the occasional occurrence of abnormal psychology or behavior and slight emotional disorder. If it can return to normal, it cannot be considered as evidence of mental health[3]. Pandhitas g, et al. University student established special psychological counseling or consulting institutions, formed their own psychological fitness data database [18]. Cherfi a, et al. Proposed using statistical analysis method to cluster analysis of various

process data of students in campus activities, so as to realize objective and effective evaluation of students' psychological fitness [4]. Karimi F, et al. As a special group, university students not only have differences in psychological quality, but also have obvious particularity in their own external environment. Today's university students are more precocious than before and are very sensitive to many things in society. The social environment they face is constantly changing, and their ways of contact are also diverse. Microblog, QQ, Facebook and other network channels can convey all things in society to them in time[10].

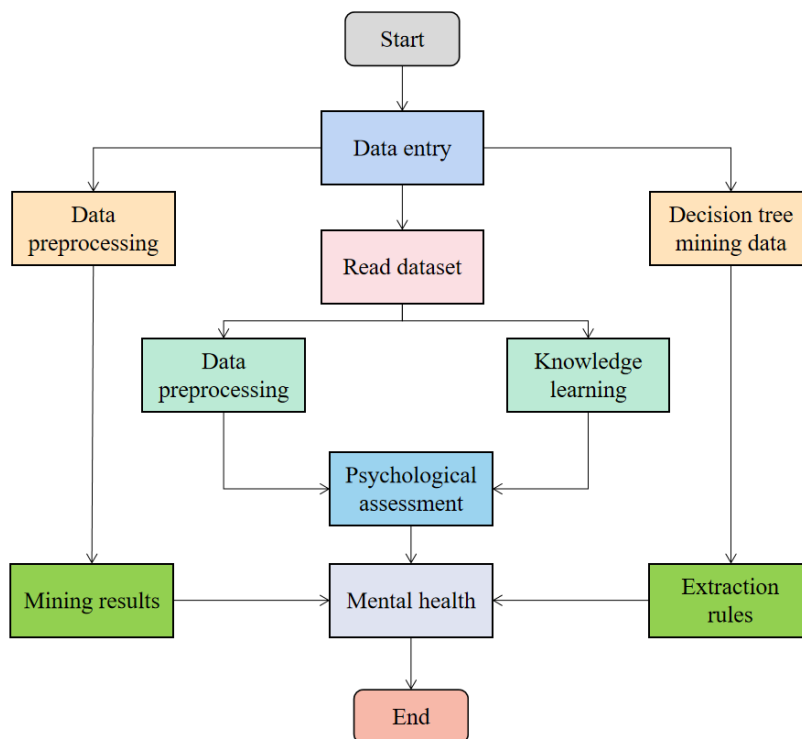
## **2.2 Research Status of University Students' Psychological Fitness Data Based on Decision Tree Algorithms**

According to the research done by the former, this paper studies the fuzzy clustering analysis of University student' psychological fitness data based on Decision Tree Algorithms. According to the principle of Decision Tree Algorithms, it can be known that the decision tree chooses the attribute with the largest information increment to split the nodes, that is, the attribute corresponding to each node in the decision tree is the factor that has the greatest influence on the target attribute. That is, the closer an attribute is to the root node in the decision tree, the greater its influence on the target attribute. The fuzzy cluster analysis system of University student' psychological fitness data is trying to find out the causes of these problems through data analysis and association rules mining, so that psychological tutors can prescribe the right medicine and solve psychological fitness problems. These factors are also factors that induce mental illness. Therefore, it is more reasonable and effective to comprehensively use various data and apply correlation analysis techniques to mine and analyze. It plays an important role in discovering the physical attributes of University student. When students have healthy somatization, the probability of psychological fitness diseases is small. Only when hostility and psychosis are at the mild level, students may have obvious mental diseases and need timely intervention. By collecting students' basic data and SCL-90 psychological fitness evaluation information and extracting related attributes, the model of University student' mental problems is constructed by Decision Tree Algorithms. In order to discover the main laws and patterns that influence the data of University student' psychological fitness, and provide more scientific and effective basis for the prevention and education of University student' psychological fitness. In a word, the social environment that University student are facing is constantly changing. It aggregates things into classes according to some attributes of things, so as to minimize the similarity between different classes and maximize the similarity between the same classes, so as to realize the classification of data. Obviously, this is still very meaningful in theoretical research and practical application. On this basis, an "intelligent analysis system for university student mental health" is designed and implemented, which can be used as an auxiliary tool for school mental health counseling. At the same time, it can accumulate the data of mental health problems and establish a database for statistical analysis, which will be of greater help to the school to carry out mental health education in the future.

## **3 PRINCIPLE AND MODEL OF DECISION TREE ALGORITHMS**

Decision tree is a tree used to represent a series of judgment processes for people to make a decision. The Decision Tree Algorithms adopts a top-down recursive method. The main elements of its construction are training tuples and their related labels. It is a method to approximate the value of discrete functions. At the same time, it is also a typical classification method. The first step is to process the data by the Decision Tree Algorithms, then calculate the readable rules or decision tree based on the induction algorithm, and then analyze and process the data of the constructed decision tree. The goal of the fuzzy cluster analysis system of psychological fitness data based on Decision Tree Algorithms is to collect data on the basis of similarity to classify. The basic idea of cluster analysis is to classify samples according to the principle of "birds of a feather flock together". When hostility is severe, it indicates that there is serious mental illness. For University student, it is very

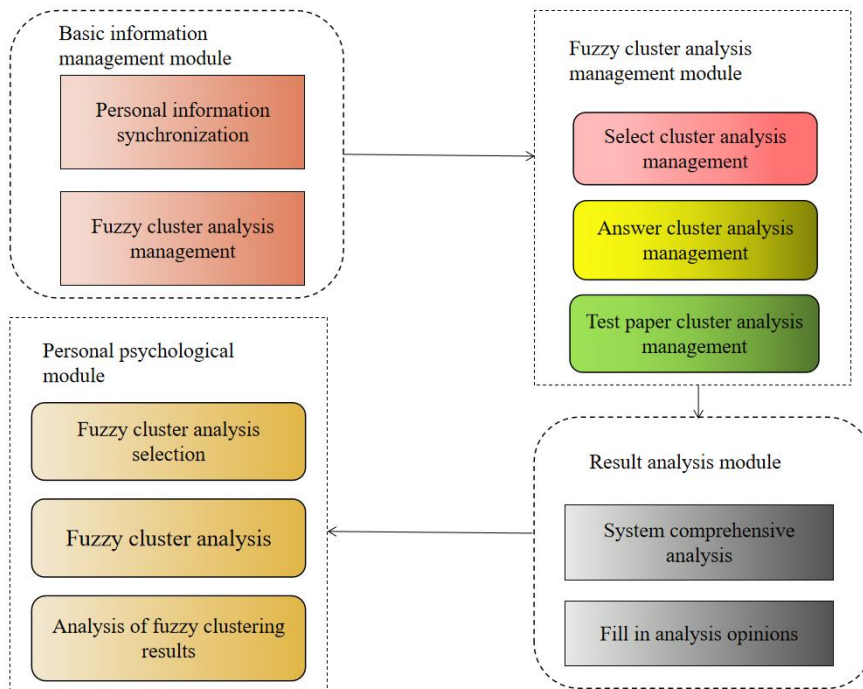
important to improve their psychological quality at school and guide them to spend their college time smoothly. When communicating or contacting with students, psychological counselors should not only pay attention to students with obsessive-compulsive disorder, but also pay more attention to the behaviors of students with anxiety and interpersonal symptoms, and do a good job in prevention. A decision tree can be represented by a flow chart, which is very similar to a tree structure. The test of an attribute is represented by internal nodes, the test results are represented by branches, and the classification or distribution of classification is represented by leaf nodes. It uses the top-down recursive method to construct the decision tree, in which ID3 is a very representative algorithm. The Decision Tree Algorithms uses the attribute with the largest information gain to establish the decision tree. In order to obtain the largest category information about the tested records, the information gain is used as the attribute selection standard to test each non node. Therefore, it is necessary to build a small-scale tree as much as possible. The Decision Tree Algorithms module can realize real-time psychological test, which is mainly due to the system's large amount of DM and analysis, knowledge learning, mining according to the current data set, and finally draw a reliable conclusion of psychological fitness evaluation. The flow chart of psychological test module is shown in Figure 1.



**Figure 1:** Psychological fitness model of decision tree algorithms.

There are two steps in dealing with decision tree classification: firstly, the decision tree classification model is generated by learning and training sets; Secondly, unknown types of samples are classified by this model. Cluster analysis method is an unsupervised learning process. When students' somatization factors are mild hostility and psychotic factors, they play a certain decisive role in

students' psychological fitness. In this case, when students have mild hostility, they usually have obvious mental illness. When the hostility is moderate, the value of psychotic factors will determine the final result. Because the objective function of fuzzy clustering is non-convex, and the non-convex function often has many local minima, it is difficult for Decision Tree Algorithms to get the global optimal solution. In order to make people have an accurate understanding of their psychological fitness, and promote the scientification and informatization of psychological fitness guidance, this paper constructs a fuzzy cluster analysis system of psychological fitness data based on Decision Tree Algorithms, which makes use of scientific fuzzy cluster analysis of psychological fitness data to comprehensively and objectively reflect users' psychological fitness level. The psychological fitness model of Decision Tree Algorithms is shown in Figure 2.



**Figure 2:** Flow chart of psychological test module.

The Decision Tree Algorithms takes the information gain rate as the measurement standard, and selects the attribute with the highest information gain rate as the splitting attribute. Let set  $S$  have  $s$  data samples, and  $S_i$  is the number of samples in  $C_i (i=1, \dots, m)$ . The expected information of set  $S$  in  $C_i$  classification.

$$I(S_1, S_2, \dots, S_m) = - \sum_{i=0}^m p_i \log 2 p_i \quad (1)$$

Where  $p_i = \frac{S_i}{S}$  represents the probability that any sample belongs to class  $C_i$ . Assuming that the attribute  $A$  has  $v$  different values  $\{a_1, a_2, \dots, a_v\}$ , the data set  $S$  can be divided into  $v$  subsets through the attribute  $A$ , where  $S_j$  represents the subset of attribute  $A$  with  $a_j (j=1, 2, \dots, v)$  in the data set  $S$ , and  $s_{ij}$  represents the number of samples belonging to  $C_i$  in the  $S_j$  subset.

$$E(A) = \sum_{i=1}^v \frac{s_{1j} + s_{2j} + \dots + s_{mj}}{s} I(s_{1j}, s_{2j}, \dots, s_{mj}) \quad (2)$$

$\frac{s_{1j} + \dots + s_{mj}}{s}$  represents the proportion of  $S_j$  subset in data set  $S$ , corresponding to the given subset  $S_j$

$$I(s_{1j}, s_{2j}, \dots, s_{mj}) = - \sum_{i=1}^m p_{ij} \log_2 p_{ij} \quad (3)$$

Where  $p_{ij} = \frac{s_{mj}}{s_j} S_{ij} / S_j$  is the probability that the sample in  $S_j$  belongs to class  $C_i$ . The information gain of attribute  $A$  is  $Gain(A)$

$$Gain(A) = I(S_1, S_2, \dots, S_m) - E(A) \quad (4)$$

The information gain rate is the ratio of the information gain to the amount of divided information

$$GainRatio(A) = \frac{Gain(A)}{split\ inf\ o(A)} \quad (5)$$

$$split\ inf\ o(A) = - \sum_{i=1}^m \frac{|S_j|}{|S|} \log_2 \frac{|S_j|}{|S|} \quad (6)$$

In this paper, the Decision Tree Algorithms is applied systematically, and the splitting index is information gain rate, which solves the problem of biased selection value multi-attribute when using information gain to select test attributes. The definition formula of information gain rate is

$$GainRatio(S, A) = \frac{Gain(S, A)}{SplitInformation(S, A)} \quad (7)$$



The data of psychological fitness intelligence evaluation is classified by Decision Tree Algorithms to provide data support for this system.

$$SplitInformation(S, A) = - \sum_{i=1}^n \frac{|S_i|}{|S|} \log_2 \left( \frac{|S_i|}{|S|} \right) \quad (8)$$

Let  $A_i$  be the bisection point. If there are  $N$  bisection points in the interval  $[MIN, MAX]$ , calculate them in sequence, and get the formula of  $i$  bisection point as follows

$$A_i = MIN + i * (MAX - MIN) / N \quad (9)$$

Type  $i = 1, 2, \dots, N$ .

The information gain function is defined as

$$Gain(D, S) = Info(S) - Info(D, S) \quad (10)$$

The psychological fitness intelligent system based on Decision Tree Algorithms mainly includes four modules: basic information management module, fuzzy cluster analysis management module, personal psychology module and result analysis module. The algorithm calculates the information gain rate of each attribute by the decision tree, The problem of clustering is to make the objective function reach a minimum value through iterative algorithm, but there are many minimum values of the objective function in the state space, only one of which is the global minimum value, while the others are all local minimum values, which is the disadvantage of local optimization of clustering analysis algorithm. How to achieve the global optimum instead of the local optimum is a severe challenge for clustering algorithm. Some improved algorithms have indeed made some achievements on the issue of ending, but they often cost a lot of time. Usually, it doesn't take long training times to estimate; Traditional clustering methods have a clear "either or" division for the results, but with the growth of data volume and the complexity of structure, the correlation between data continues to strengthen, and more and more data have a "either or" relationship. It is important for them to develop morally, intellectually and physically in an all-round way, but the cultivation of their mental health is also indispensable. Because healthy psychology is the foothold of improving people's own quality, and it is also the stepping stone of people's success. Modern science tells us that a healthy person should have not only a healthy physique, but also a healthy psychology. After users select items, the system provides them with corresponding test questions, and gives the evaluation results and corresponding treatment after users finish answering questions. The results of the submitted test questions can be analyzed in the result analysis module in detail. When students have healthy somatization, the probability of psychological fitness diseases is small. Only when hostility and psychosis are at the mild level, students may have obvious mental diseases and need timely intervention.

#### 4 REALIZATION OF FUZZY CLUSTER ANALYSIS SYSTEM FOR UNIVERSITY STUDENT' PSYCHOLOGICAL FITNESS DATA

##### 4.1 Design of Fuzzy Clustering Analysis System for Psychological Fitness Data Based on Decision Tree Algorithms



It plays an important role in discovering the physical attributes of University student. When students have healthy somatization, the probability of psychological fitness diseases is small. Only when hostility and psychosis are at the mild level, students may have obvious mental diseases and need timely intervention. The goal of the fuzzy cluster analysis system of psychological fitness data based on Decision Tree Algorithms is to collect data on the basis of similarity to classify. The basic idea of cluster analysis is to classify samples according to the principle of "birds of a feather flock together". Cluster analysis method is an unsupervised learning process. It aggregates things into classes according to some attributes of things, so as to minimize the similarity between different classes and maximize the similarity between the same classes, so as to realize the classification of data. It is a process of data processing, in which physical or abstract object sets are grouped. This set of objects is also called clusters. The ideal result of clustering is that the dissimilarity between objects in clusters is the highest, and the similarity between objects in clusters is the highest. The clustering process also revolves around this goal accordingly, such as how to measure the dissimilarity and similarity between objects, the most appropriate number of clusters, how to deal with isolated points, and so on. At present, the psychological quality of University student is relatively fragile. If the information is stolen or disclosed, it will cause a fatal blow. The fuzzy clustering analysis system of university student mental health data based on decision tree allows administrators and technicians to understand the specific requirements of the intelligent analysis system of university student mental health, including functional requirements, performance requirements, data requirements, operation requirements and other requirements. This document is a technical document written by myself and confirmed by relevant teachers and administrators of the school. It is the basis and guide for the next stage of system design and coding, and it can be used by technicians in the project team of intelligent analysis system for university student mental health for reading, communication and research.

When students' somatization factors are mild hostility and psychotic factors, they play a certain decisive role in students' psychological fitness. In this case, when students have mild hostility, they usually have obvious mental illness. When the hostility is moderate, the value of psychotic factors will determine the final result. When the psychotic factors are healthy, it means that the mental issue are not obvious. When the psychotic factors are moderate, it means that there is serious mental illness. When hostility is severe, it indicates that there is serious mental illness. For University student, it is very important to improve their psychological quality at school and guide them to spend their college time smoothly. When communicating or contacting with students, psychological counselors should not only pay attention to students with obsessive-compulsive disorder, but also pay more attention to the behaviors of students with anxiety and interpersonal symptoms, and do a good job in prevention. Because the objective function of fuzzy clustering is non-convex, and the non-convex function often has many local minima, it is difficult for Decision Tree Algorithms to get the global optimal solution. The fuzzy cluster analysis system of University student' psychological fitness data is trying to find out the causes of these problems through data analysis and association rules mining, so that psychological tutors can prescribe the right medicine and solve psychological fitness problems. The system can easily find the University student who have problems through abnormal data analysis, and association rules mining can help to find the reasons. It is an intelligent analysis system, which can bring great help to University student' psychological fitness.

Personality questionnaire is mainly used to evaluate university student mental health level, screen university student mental problems, establish freshmen's mental files and observe their mental health dynamically. It can help counselors or tutors to quickly find out the subjects with problems, so that schools can provide targeted psychological counseling services to university students with psychological problems in time and make corresponding psychological crisis intervention measures. Children from healthy families are full of hope for life and have great confidence in their emotional life. Due to the lack of parental care, lack of sense of security, nerve sensitivity and emotional vulnerability, University student who have both parents died are always

timid in doing things, and their mental issue are extremely significant. Unsound families with single parents or divorced parents will always do harm to their children's psychological fitness in varying degrees and levels. The implementation process of university student mental health is firstly to collect university student mental health test data, and then to establish a comprehensive mental health test database by selecting and cleaning the data attributes. Next, the database is analyzed by decision tree algorithm to produce clustering results, and finally, the mental health factors of university students are predicted, analyzed and scientifically evaluated to provide objective and reliable data guarantee for mental health counseling. Through Decision Tree Algorithms, set up psychological lectures or extracurricular psychological courses, improve the main channel of psychological fitness education, adopt a variety of educational methods, enrich the content of psychological fitness education, and prepare professional psychological counseling teams, which is very important to improve the overall psychological fitness level of University student.

## 4.2 Experimental Results and Analysis

In this experiment, when the number of clusters increases from  $C_{\min}$  to  $C_{\max}$ , the number of clusters corresponding to  $c$  is calculated by formula (7). When  $c=3$ , the fuzzy clustering center results shown in Table 1 are obtained.

Center 1	Center 2	Center 3	Center 4	Center 5	Center 6	Center 7	Center 8
1.022	-0.784	1.955	0.293	0.218	1.354	0.568	1.662
1.491	0.548	0.000	-0.832	-0.406	0.952	0.096	-0.772
0.961	0.001	0.764	0.127	0.127	1.525	0.836	1.091

**Table 1:** Fuzzy clustering center.

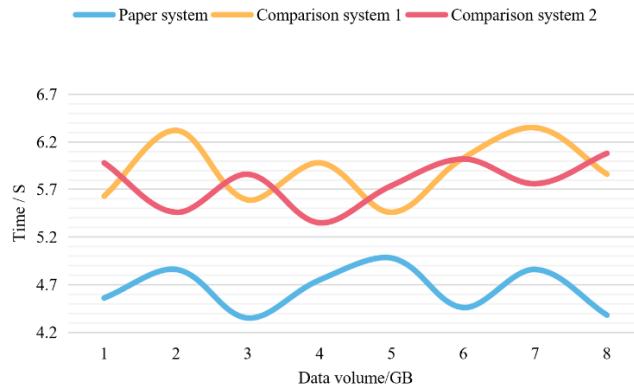
When  $c=4$ , the fuzzy clustering center as shown in Table 2 is obtained.

Center 1	Center 2	Center 3	Center 4	Center 5	Center 6	Center 7	Center 8
1.923	-0.184	1.655	0.293	0.218	1.354	0.558	1.162
0.403	0.548	0.034	-0.882	-0.306	0.952	0.096	-0.722
0.562	0.541	0.964	0.127	0.000	1.523	0.836	1.091

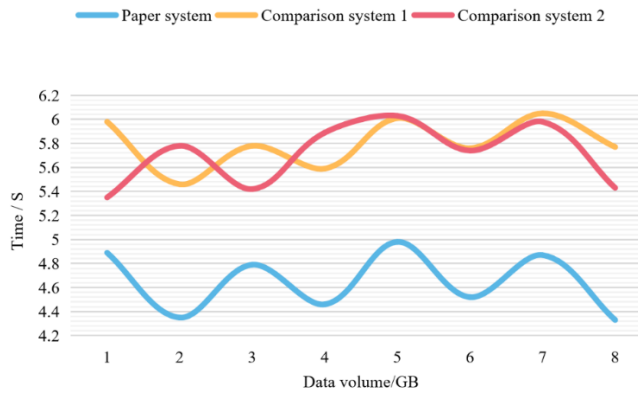
**Table 2:** Fuzzy clustering center.

As shown in Table 1-Table 2, combine the initial cluster center and eight classes in pairs according to the class merging principle to form a new small class pair, then use the evaluation function to detect whether each small class pair meets the merging conditions, and generate - queues for the small classes that meet the merging conditions: the necessary number in the final cluster is 4. Then, the outlier analysis algorithm based on clustering algorithm is used to analyze these data in detail, trying to determine the psychological fitness of each university student.

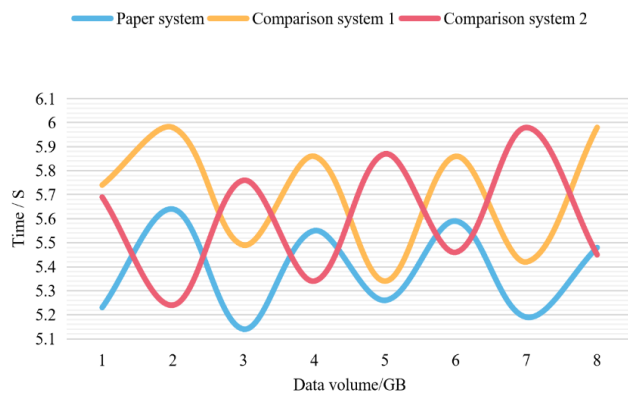
The on-the-job mental health automatic evaluation system based on fuzzy cluster analysis is a comparison system, which is represented by comparison system 1 and comparison system 2 respectively. Three experimental comparisons are made, and the experimental data processing time results are shown in Figure 3, Figure 4 and Figure 5.



**Figure 3:** Data processing time of three systems.



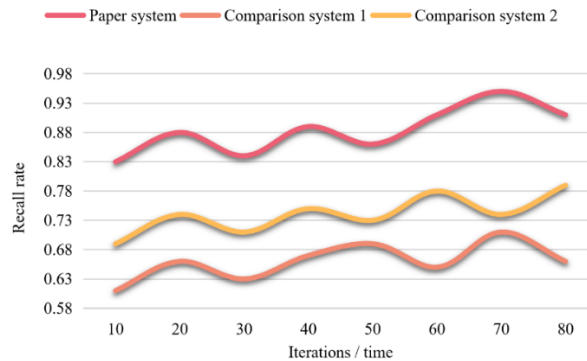
**Figure 4:** Data processing time of three systems.



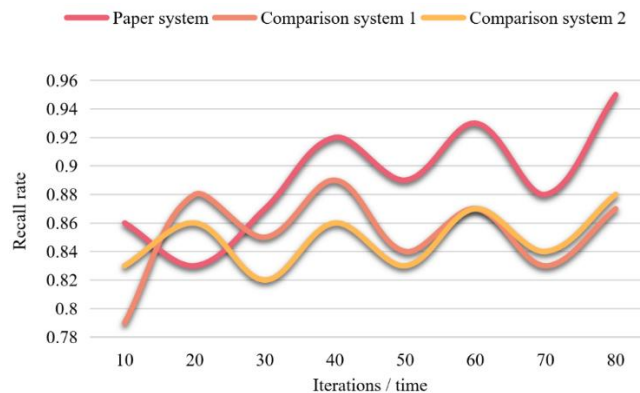
**Figure 5:** Data processing time of three systems.

As can be seen from Figure 3- Figure 5, the data processing time of this system is always lower than that of the other two systems. With the continuous increase of data, the data processing time of the three systems changes. When the data reaches 5GB, the average time of the comparison system 1 is 5.67S, that of the comparison system 1 is 5.84S, and that of this system is 5.09S s. With the increase of information, the data processing time rises sharply, with large fluctuation and poor stability. The increase of data processing time of this system is small, the curve is smooth, the stability is good, and

This experiment compares and tests the information recall rates of the three systems in psychological evaluation through two experiments. The experimental results are shown in Figure 6 and Figure 7.



**Figure 6:** Comparison of recall rates of three systems.



**Figure 7:** Comparison of recall rates of three systems.

According to the findings of the experiments, it has a high recall rate and excellent performance with adaptive scheduling. When compared to system 2, which has a far lower recall rate, system 1's rate of accuracy is subject to a considerable deal of variation. It is hard to artificially evaluate or make choices on psychological fitness when there are a big amount of facts related to psychological fitness; thus, it is the common tendency to develop an intelligent analysis system. Analysis of a person's scientific psychological fitness has the potential to conserve a significant amount of both human and

material resources, raise the bar for the quality of psychological counseling provided in schools, promote the physically and mentally sound development of university students, and position the country to become a solid pillar in the years to come. For the purpose of diagnosing mental health conditions, it does play a part in determining the reason and making a diagnosis; but, it also has significant limits.

## 5 CONCLUSIONS

In this research, a fuzzy cluster analysis system of university students' psychological fitness data is constructed on the basis of decision tree algorithms. The goal of this system is to increase the effectiveness of intelligent evaluations of psychological fitness. With the continual rise of data, the data processing time of the three systems all varies. When the data exceeds 5 gigabytes, the average time taken by comparison system 1 is 5.67 seconds, the average time taken by comparison system 1 is 5.84 seconds, and the average time taken by the method described in this article is 5.09 seconds. The amount of time it takes to process the data dramatically grows as more information is added, and the fluctuation range is rather wide and the stability is not very good. When the clustering results are compared to those of the Decision Tree Algorithms, it demonstrates that it has certain advantages. At the same time, it discovers the class structure that was hidden in the attribute of health data as well as the influence of essential health factors on the clustering results, which further demonstrates the practicability of the algorithm and provides a reference for the early prevention of psychological fitness education for university students as well as the formulation of intervention strategies for university students. The system is able to readily identify university students who are having issues by analyzing aberrant data, and the decision tree algorithm is able to assist in determining the factors that are contributing to these issues. It is an intelligent analysis system that provides university students with a great deal of assistance, which is beneficial to their mental health. Emphasize the potential positive impact of utilizing computer-aided medical analysis for improving the psychological well-being of university students.

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