Research on College Students' Health Education Based on Feature Extraction Algorithm

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Abstract. The research of students' mental health education is the need of the development of the times, the need of the development of higher education practice in our country, and also an important measure to comprehensively implement the party's education policy, implement quality education, and strengthen moral education in Colleges and universities. It is of great significance to promote the healthy growth and success of college students, deepen the teaching reform of College Students' mental health education, promote and steadily implement quality education, and realize the talent training goal of higher education.

Keywords: College students · Mental health · Educational countermeasures

1 Introduction

In recent years, the mental health problems of college students have caused widespread concern from all walks of life, and the investigation and Research on the mental health of college students are also increasing. On the basis of inheriting the traditional mental health education thoughts, China has formed a mental health education mode with local characteristics. It has made positive progress in classroom teaching, team building, publicity and education, and carrying out consultation and counseling activities. It has also accumulated rich experience, which has laid a good foundation for us to further promote college students' mental health education. But we should also be aware that the work of mental health education for college students is facing more complex environment and arduous tasks [1]. On the whole, the current work is far from meeting the needs of the development of the situation. This work has been carried out unevenly in various places and schools, and its importance is not fully understood, and it has not been put in its proper position; some colleges and universities lack sufficient exploration and Research on the tasks, characteristics and laws of College Students' mental health education under the new situation; some colleges and Universities need to strengthen the construction of College Students' mental health education team.

SIFT (scale invariant feature transform) is an algorithm for detecting local features. It searches for extremum points of a pair of images in spatial scale, extracts its position, scale, rotation invariants and other descriptors, obtains features and matches image feature points to detect and describe local features in images.

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It is based on some local features of the object. SIFT features are the local features of the image, which keep invariance to rotation, scaling and brightness changes, and also keep a certain degree of stability to the changes of viewing angle, affine transformation and noise; The detection rate of partial object occlusion using SIFT feature description is also quite high, even more than three sift object features are enough to calculate the position and orientation.

The essence of SIFT algorithm is to find the key points (feature points) in different scale space, and calculate the direction of the key points. The key points found by SIFT are some very prominent points that will not change due to illumination, affine transformation, noise and other factors, such as corner points, edge points, bright spots in dark areas and dark spots in bright areas.

Lowe decomposes the SIFT algorithm into the following steps:

(1) Input image, suggest double (width * = 2, height * = 2, size * = 4), and Gaussian filter for smoothing.
(2) Decide how many towers to build according to the image size, and how many layers of each tower (generally 3–5 layers). Layer 0 of tower 0 is the original image (or the image after you double). Each layer up is Laplacian transform (Gaussian convolution, where the Sigma value gradually increases. For example, it can be sigma, K * sigma, K * k * sigma…). Intuitively, the higher the image is, the more blurred the image is. For example, the 0 th layer of tower 1 can be obtained from the 3 rd layer of tower 0 by down sample, and then Gaussian convolution operation similar to tower 0 can be performed.
(3) Build the dog pyramid. The dog pyramid is calculated from the Gauss pyramid generated in the previous step. The number of towers is the same, and the number of layers of each tower is less than 1, because each layer of the dog is obtained by subtracting two adjacent layers of Gauss.
(4) The extremum points are detected in the dog tower, and the illegal feature points are removed according to the preset contrast threshold and principal curvature threshold. Non maximum suppression is used to detect extreme points, that is, the gray value is compared among 3 * 3 * 3 points, and the minimum or maximum is passed.
(5) The scale of each feature point is calculated. Pay attention to the scale relationship between towers, sigma * 2.0 ^ (octvs + intvl / intvls).
(6) The gradient modulus and direction of each feature point are calculated. The feature point is described by a point in a patch around the feature point, and the histogram of the feature point is used to count the modulus and find the main direction, which can be more than one.
(7) Finally, we need to generate 64D or 128d feature descriptors. Align the main direction and calculate the 2D array of direction histogram. If each histogram has 8 bin, then 64D (2 * 2 * 8 bin) or 128d (4 * 4 * 8 bin).

2 Feature Extraction Algorithm

2.1 Main Design Ideas of Feature Extraction Algorithm Database

The speed of data index and query directly affects the efficiency of subsequent data feature extraction and data mining. Therefore, this paper uses the full-text search engine

to process the full-text index, spatial index based on spatial location, and abstract index of image, audio and video open-source intelligence; uses mys α l to establish the open-source intelligence data cataloging index and association search based on relational model of each United States; Mongo DB is used to build summary information index based on key value pairs and spatial location index based on R-tree.) parallel computing framework is used to solve the efficiency problem of massive open-source intelligence data processing. In this framework, map reduce component is mainly used to provide heavy parallel processing functions such as feature extraction and mining of large-scale open-source data [2]. The component adopts the map reduce parallel computing model, as shown in Fig. 1.

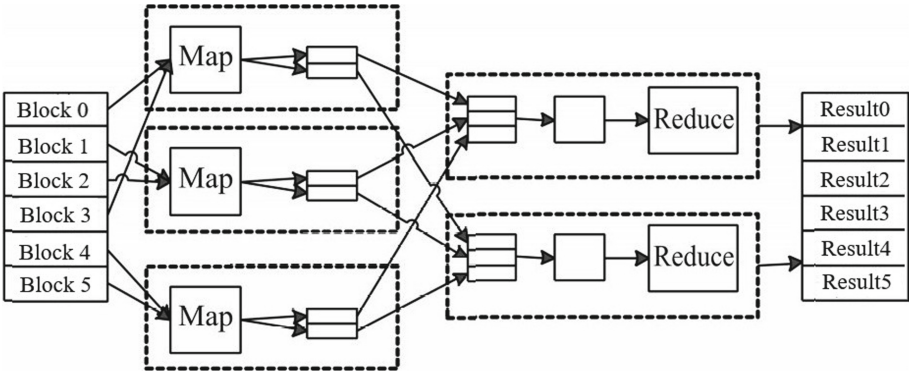

Fig. 1. Map reduce parallel computing model.

2.2 Overall Flow of the Algorithm

Among them, the method based on word frequency statistics has the advantages of easy to understand, simple process and good feature differentiation, so it is most widely used in practical applications. Tf-df (TEM frequency inverse document frequency) method is one of the most representative feature extraction algorithms. TF-IDF algorithm uses term frequency TF (term frequency) and inverse document frequency IDF (inverse document frequency) The word frequency represents the frequency of a specific keyword in a single text file, and the inverse text frequency represents the ability of the same keyword to distinguish categories in the whole document set. Finally, the weight of keywords is obtained by combining TF and IDF frequencies.

$$TF = \frac{N_{i,j}}{\sum_{k} N_{k,j}} \tag{1}$$

$$IDF_i = \log \frac{|D|}{1 + \left|\{\, j \middle| i \in d_j \middle| \}\right|} \tag{2}$$

$$TF - IDF_{(i,j)} = TF \times DF \tag{3}$$

3 The Standard of College Students' Mental Health

According to the definition of mental health, combined with the psychological characteristics of college students and their special environment and social roles, college students with mental health should meet the following standards.

3.1 Normal Intelligence, with a Strong Interest in Learning

Intelligence refers to the comprehensive ability of observation, attention, memory, imagination, thinking, creativity and practical activities. Normal intelligence is the most basic psychological condition for people to engage in life, study, work and other activities, and it is also the necessary psychological guarantee to adapt to the changes of the surrounding environment. The intelligence of college students is generally excellent, they have a strong ability of learning or understanding, the ability to acquire and update knowledge, the ability to quickly and accurately respond to new things, the ability to use reasoning to effectively solve problems and so on [3]. Learning is the main content of university life. Students with mental health have clear learning objectives, can maintain a strong interest in learning and desire for knowledge, are willing to accept new things and dare to challenge, are good at overcoming difficulties in learning, have stable academic performance, can maintain a certain learning efficiency, and can experience satisfaction and happiness from learning.

3.2 Good Environmental Adaptability

Living in a complex and changeable world, people will encounter a variety of environments and changes. Therefore, having a good ability to adapt to the environment is an important symbol of College Students' mental health. The ability to adapt to the environment includes the ability to correctly understand the environment and the ability to correctly deal with personal and environmental relations. College students with mental health can keep good contact with the environment, have a clear understanding of the current social situation, face the reality when the environment changes, make an objective understanding and evaluation of the environment, and timely correct their needs and wishes according to the changing environment, so that their personal behavior can meet the requirements of the new environment; when there is a contradiction between personal needs and the society, the students with mental health can face the reality, They can choose a positive way to adjust the conflict between themselves and the society, so that they can keep in harmony with the society in thought and behavior. College students with mental health also have a strong sense of competition and innovation, dare to face the changes and challenges of life and society, and constantly realize self-improvement and self transcendence.

4 The Contents, Methods and Countermeasures of Strengthening College Students' Mental Health Education

4.1 Strengthening the Mental Health Education of College Students

Cognitive development education cognitive ability includes the ability to know oneself, others and everything. The university stage is an important period for college students

from youth to adulthood, and it is also an important stage for the development and improvement of College Students' cognitive ability. Correct cognition of self and others is an important premise for college students to correctly evaluate themselves, learn to get along with others, and then better develop themselves. In real life, many college students have contradictions between ideal and reality, ups and downs in emotion, inferiority and depression in the face of setbacks, and paranoia and paranoia in character, all of which are due to the deviation of cognitive development. Therefore, the cultivation of correct cognitive ability, correct treatment and evaluation of themselves and others will help college students deal with the relationship between ideal me and reality me, between me and others, between me and society, and establish a healthy and good self-image [4]. By learning the basic knowledge of emotion management and regulation, college students can strengthen the understanding and control of their own emotions, master the skills of self emotion management, actively regulate their own emotions, and be the masters of emotions.

4.2 Methods and Countermeasures of Strengthening College Students' Mental Health Education

Strengthening college students' mental health education is an urgent requirement of social development and college students' own development. At present, society, school, family and other aspects have realized the importance of College Students' mental health education. In the face of the psychological problems and obstacles among college students, we should attach great importance to them, strengthen the mental health education, timely prevent and solve the psychological problems faced by college students, and improve their physical and mental health. Based on the above analysis, we think we should start from the following aspects to carry out the mental health education of college students.

5 Conclusion

The mental health of college students is affected by many factors, including the internal reasons of individual physiology and psychology, as well as the external reasons of society, family and school. We should take positive and effective measures to deal with the current situation of College Students' mental health and its influencing factors, mainly through the opening of mental health education courses, the establishment and improvement of psychological counseling institutions, the development of campus culture, the strengthening of the construction of teaching staff and other channels, Mental health education on cognition, emotion, personality, learning communication, love, job hunting and so on should be carried out to cultivate college students' good psychological quality and improve their mental health level.

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