Scholar Publishing Group
International Journal of Big Data Intelligent Technology
https://doi.org/10.38007/IJBDIT.2020.010204
ISSN 2790-0932 Vol. 1, Issue 2: 42-57

Evaluation of Students' Comprehensive Quality Based on Improved Genetic Algorithm

Min Qian*

Northwestern Polytechnical University, Xi'an, Shaanxi, China

**corresponding author*

Keywords: Genetic Algorithm, Improved Genetic Algorithm, Comprehensive Quality, Comprehensive Quality Assessment

Abstract: Over the years, colleges and universities have evaluated students based on their course scores, but neglected the cultivation of other abilities. This has led students to focus on learning textbook knowledge, poor practical ability, and innovative awareness. They must become outstanding public security college students with comprehensive development. There's still a long way to go. Therefore, how to establish a scientific and comprehensive quality evaluation system is an urgent problem that should be resolved in the process of quality education. The purpose of this article is to conduct research on the comprehensive quality assessment of public security college students based on improved genetic algorithms, so as to establish a more complete comprehensive quality assessment system and comprehensively improve the comprehensive quality of students. This article proposes that there are many shortcomings in the purpose, content, and methods of comprehensive evaluation of student quality in modern schools. Mainly, they have more qualitative analysis and research, but less quantitative analysis. Combining the intentions of college students and employers, Strengthening the preparation of the comprehensive quality evaluation of college students is to effectively implement the comprehensive quality evaluation of local school studentsUpdate the concept of comprehensive quality assessment, formulate scientific evaluation standards, and implement training for relevant personnel. Strengthen the process supervision of the comprehensive quality assessment of college students. In the experimental results of this article, the average requirement for scientific and cultural quality reached 65%, ranking first in morality, intelligence, and physical, while the requirement for humanistic quality was only 1%, which is far lower than the requirement for scientific and cultural quality. This shows that Contemporary society does not have high requirements for comprehensive quality. The improved genetic algorithm overcomes the shortcomings of the current weighted average scores commonly used by various universities to queue students, and can comprehensively evaluate the overall quality of public security college students. Its excellent ease of use and operability indicate that it can specifically reflect each of the things.

1. Introduction

Now, high-quality education has become the consensus of the whole society. As the birthplace of talent training, the university will adhere to the core of high-quality education, comprehensively deepen education and education reform, and cultivate pioneering talents with professional skills. The ability to keep pace with the times and high-quality education is a long and hard work. Higher education institutions are the birthplace of talent cultivation. The "General University Student Management Rules" stipulates that “universities should devote themselves to talent cultivation”. Although the country has been calling on universities to carry out quality education in recent years to comprehensively ,the quality of talent training needs to be improved, there are still a small number of students who can achieve comprehensive development of morality, intelligence, physical beauty, and most of the students. Practice, pay attention to mechanical learning and despise humanistic feelings. One of the reasons for these problems that cannot be ignored is the imperfectness of the student quality assessment link. There are some problems in colleges and universities at this stage, such as over-emphasizing academic performance and underestimating the cultivation of quality and ability. Now, from the perspective of promoting a high-quality education process in higher education, it has actually entered a new level, and the quality of college students has been affected. Evaluation, especially the comprehensive quality evaluation, is still relatively weak. It will affect the further strengthening and improvement of the university, "Bottlenecks" in high-quality education for students. Therefore, designing and formulating a scientific and practical comprehensive quality evaluation system is not only a guideline for the overall quality training of college students, but also makes the quality education work of public security universities more concentrated, active and effective.

Comprehensive quality assessment activities are an effective means to improve the comprehensive quality of students in public security colleges and universities. Therefore, how to conduct comprehensive quality assessment of students is helpful for university management to meet the needs of social employers. The training of talents in universities needs to realize the whole process of human education and comprehensive education on the basis of comprehensive training of compound talents that meet the needs of the society, So that the trained students can have perfect abilities and qualities when they graduate. Not only learn to learn, but also learn to live and survive. When faced with challenges and opportunities, they can seize opportunities and become international talents who are capable of facing society and going international. Therefore, in the past, it was incomplete to evaluate students based on their academic performance alone, and it was unable to fully show the performance of students in school, and it did not meet the requirements of engineering education. Comprehensive evaluation of students to help students understand themselves, develop their own strengths, and maximize their strengths and avoid weaknesses. At the same time, it also helps schools, including employers after graduation, to understand the situation of students and carry out targeted work.

As the society’s demand for talents is getting higher and higher,Society pays more and more attention to the cultivation of students with comprehensive quality. Safari J proposed a genetic algorithm (GA) for the assignment problem. Most solutions to general assignment problems assume that each subsystem is fixed. In a word, genetic algorithm has been concerned by people. However, in life, the choice of redundancy strategy becomes an additional decision variable. This is a NP hard problem. Because it is too complex, it is necessary to find new solutions[1]. The operating constraints of the generator set are included in this method. The proposed algorithm was tested on the Macedonian power system, and the obtained results were compared with those obtained from

the approximation method [2]. Scientifically and reasonably evaluate the overall quality of higher education students, provide a guarantee for the targeted development of quality education in colleges and universities, and help students determine development goals and directions. Therefore, Lu W first studied the comprehensive quality evaluation index system (EIS) of higher education students.Then a comprehensive quality evaluation model was established. The FCE algorithm is designed in detail and applied in practice. The application results show that fuzzy comprehensive evaluation can reasonably evaluate the comprehensive quality of students from all aspects and levels. [3]. XU Yan suggested that high school students do a good job in ideological and political leadership and build a good student cadre is one of its important links. Student cadres in colleges and universities have high political, moral, and moral qualities. They still have many shortcomings in terms of ability and quality. They cannot play their role of demonstration and guidance well, and their effects on education are insufficient. Therefore, from the four aspects of society, school, family and individual students to analyze the comprehensive quality of college student cadres. Provide an improvement strategy corresponding to the reason for the defect [4].In order to promote, establish, develop and maintain the successful long-term relationship of all students, Annamdevula puts forward that the student loyalty of the higher education department helps university administrators make appropriate plans, and the quality of service is related to student loyalty through student satisfaction.Design/methods/approaches: The study designed and collected data from the three oldest state universities in Andhra Pradesh, India, and used structural equation modeling to find out the service quality of the higher education sector, student satisfaction and Loyalty of students. Results In this study, we tested the proposed research model and proved the satisfactory mediating role of students between service quality and student loyalty. The quality of service is an important factor in student satisfaction [5]. Richardson J discusses the relationship between the five contributions to the early research on processing levels and learning methods, as well as the precursor-process-product model and historical discussion of student learning related to current theoretical discussions. The field has benefited from the development of more powerful instruments, but researchers must continue to develop new metrics, including online metrics for student strategies. Researchers need to consider ways to improve the quality of student learning by using problem-based courses and other student-centered methods [6]. Meredith compared health-related behaviors, reliance on public assistance programs, civic participation, and next-generation well-being indicators. In addition to reporting median income by education level, it also examines the continuing differences in university participation and completion of different socioeconomic groups. The huge benefits of post-secondary education make it a priority to ensure that all those who can benefit have more opportunities. [7]. Schweinhart proposed: In the traditional comprehensive quality evaluation of college students, even if it is professional quality, a single test result will be used to evaluate the quality of students. Professional performance is the only index to evaluate the comprehensive quality of students. As a result, students are not only focused on exams, but only on exam scores, have no motivation to exercise practical and practical skills, and are not enthusiastic about participating in various club activities and public welfare activities, but sacrifice their personal interests and opportunities. This is the root cause of the difficulty in implementing high-quality education. In order to pursue high scores, a small number of students will use daily homework and even cheat exams. This hinders the overall development of students' moral, intellectual, and physical, and affects the development of good study habits, also affected the style of study and school spirit [8]. The problem in the traditional evaluation of college students: the concept of high-quality education has not been established, and only the academic performance is concerned. There is no scientific method to reflect the relationship between different courses. The

internal relationship that does not reflect "ethics" is intellectual, physical, and beautiful. In traditional evaluation methods, students will fall into the "trap" of "high scores but low energy".

The innovations of this article are: (1) This article uses modern education concepts and educational evaluation theories, from a qualitative and quantitative perspective, using management, economics, pedagogy and human resources to study the comprehensive quality evaluation of college students, scientific, reasonable, and As well as establishing executable projects, using a comprehensive quality evaluation index system for college students that meets modern needs. (2) Propose a multi-strategy selective genetic algorithm based on reinforcement learning. In order to enhance the adaptability of the algorithm, genetic algorithm and reinforcement learning algorithm are combined. The algorithm uses various selection strategies to divide the entire population into sub-populations, and then evolve them separately. In this way, the overall diversity will increase. This leads to the conclusion that comprehensive quality is far more important than high scores.

2. Genetic Algorithm

This is a computational model that simulates Darwinian genetic selection and natural exclusion biological evolution [9]. In 1975, it was proposed by a Dutch professor at the University of Michigan in the United States. The rapidly developed, highly parallelized adaptive retrieval function penetrated into various fields such as neural networks, function optimization, adaptive control, and machine learning. The genetic algorithm is similar to the evolution of biological genetics, that is, maintaining natural elimination, crossover and mutation, maintaining good groups, eliminating poor groups, and realizing "natural elimination and the most appropriate survival." [10]. Generally speaking, it is very important and necessary to train students with high comprehensive quality who adapt to social development, how to evaluate whether the trained students have good comprehensive quality, and to give a reasonable evaluation model. Figure 1 is the entire process framework of this article:

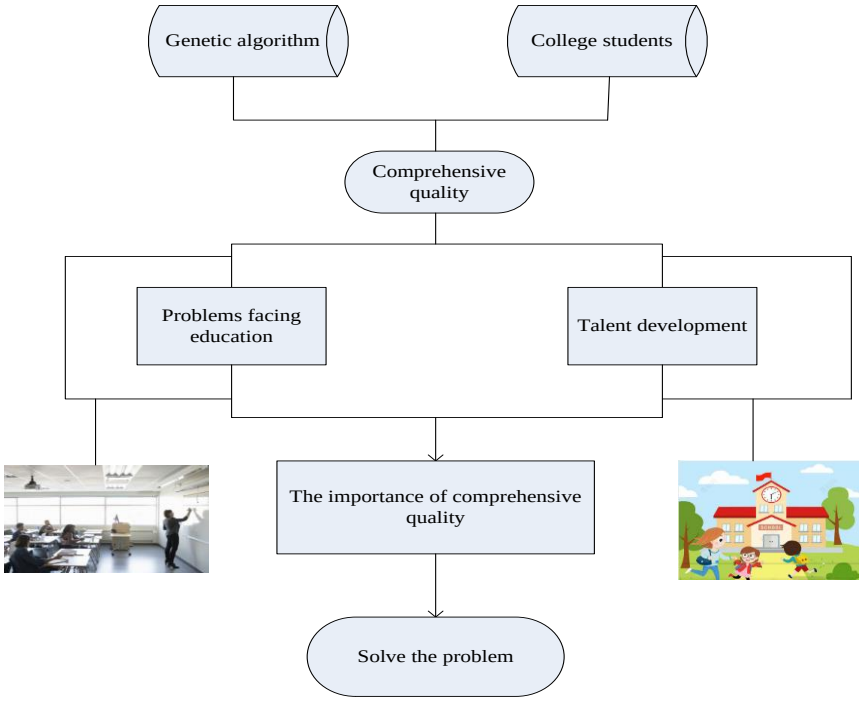

Figure 1. The process framework of this article

2.1. Suspicious Comprehensive Evaluation Method

This method is a method to approve and resist the necessary evaluation objects by using the theory of fuzzy mathematics, and comprehensively analyze multi-factor evaluation and multi-stage evaluation [11]. Its characteristic is that it can analyze some influencing factors that are difficult to quantitatively analyze through their membership degree and weight. Its mathematical model can be divided into one-level and multi-level. In order to avoid the shortcomings of the above methods as much as possible, this article uses a new evaluation model, which constructs a judgment matrix based on a fuzzy evaluation matrix, and then uses a standard genetic algorithm to test and modify the consistency of the judgment matrix, and calculate the weight of each element [12]. Introducing the weight value calculation model of genetic algorithm, its modeling process includes the following steps. In order to eliminate the dimensional effects of each evaluation index and make modeling more common, the sample data needs to be standardized. In order to fully maintain the change information of each evaluation index value, the following standardized processing formula is decided:

$$s(i,j)=x(i,j)/[w_{\max}(i)+w_{\min}(i)] \tag{1}$$

The smaller the better, the standardized processing formula is:

$$s(i,j)=[w_{\max}(i)+w_{\min}(i)-w(i,j)]/[w_{\max}(i)+w_{\min}(i)] \tag{2}$$

Software engineering master's degree thesis step one: the sample evaluation indicators are processed uniformly and dimensionlessly to construct the fuzzy evaluation matrix. Starting from the actual situation of the evaluation system to be studied, establish a systematic, representative and adaptable fuzzy comprehensive evaluation index system, and use the sample data of each evaluation index to establish its relative membership degree fuzzy evaluation matrix [13].

The formula for standardized processing of the more optimal type of China is:

$$s(i,j)=w(i,j)/[w_{\max}(i)+w_{\min}(i)], w_{mid}(i)\le w(i,j)\pi\ w_{mid}(i) \tag{3}$$

$$s(i,j)=w(i,j)/[w_{\max}(i)+w_{\min}(i)], w_{\min}(i)\le w(i,j)\pi\ w_{\max}(i) \tag{4}$$

In the formula: $w_{\max}(i)$ and $w_{mid}(i)$, $w_{\min}(i)$ formula respectively represents the minimum, maximum and intermediate value of the first indicator of the scheme. Indicates the evaluation index value after normalization processing. This is equivalent to the relative membership value of the j-th i-evaluation index. Selecting value elements and balance elements can form a single indexed fuzzy evaluation matrix $R=(y(i,j))_{n\times m}$. Selecting $y(i,j)$ the a-value balance element can form a single-index fuzzy evaluation matrix to represent the evaluation index value after standardization. This is equivalent to the relative membership value of the j-th i-evaluation index. . By selecting the value element and the balance element, a fuzzy evaluation matrix of a single index can be formed.

$$u_{ik}=[y(i)-y(k)](b_m-1)/(y_{\max}-y_{\min})+1, y(k)\le y(i) \tag{5}$$

$$u_{ik}=1/[y(i)-y(k)](b_m-1)/(y_{\max}-y_{\min})+1\}, \ y(i)\le y(k) \tag{6}$$

In the above formula: $y_{\max}$ and $y_{\min}$ respectively represent the minimum and maximum values of $\{y(i)|i=i\to n\}$. In addition, the parameter values of relative importance can be expressed as a

small function and a cyclic function as a minimum function and a maximum function, respectively.

Step 3: Confirm and correct the consistency $u_{i(i=1,2,..n)}$ of the judgment matrix, and calculate the weights $u_i \phi 0$ and $\sum_{i=1}^{n} u_i = 1$ of each evaluation index. According to the definition of the judgment matrix, Equation 7 can be known as follows.

$$u_{ik} = r_i / r_k (i = 1,2...,n; k = 1,2,...n) \tag{7}$$

Attribute (1) represents the unity of the judgment matrix, attribute (2) represents the reciprocity of the judgment matrix, and attribute (3) represents the consistency condition of the judgment matrix, which means that the mutual relationship can be quantitatively communicated. Property (3) is a sufficient condition for property (1) and property (2).

$$\sum_{i=1}^{n}\sum_{k=1}^{n} |i_{ik}u_k - u_i| = 0 \tag{8}$$

Considering the complexity of the actual evaluation system and the diversity, one-sidedness and instability of people's subjective understanding, objective existence cannot fully satisfy the consistency condition of the judgment matrix. The layering process usually only needs a matrix to adapt to various complex systems to achieve sufficient consistency. If the consistency of B is sufficient, the revised decision matrix $e = \{y_{ik} - e_{ik}\}_{n\times n}$ of B needs to be modified and recorded as the weight value $y_{i(i=1,2,..n)}$ of each element. Therefore, the smallest matrix Y is the best matching decision matrix of B.

$$\min CIC(n) = \sum_{i=1}^{n}\sum_{k=1}^{n} |y_{ik} - e_{ik}| / n^2 + \sum_{i=1}^{n}\sum_{k=1}^{n} |y_{ik}u_k - u_i| / n^2 \tag{9}$$

$$\sum_{i=1}^{n} w_i = 1 \tag{10}$$

Obviously, Equation 9 is a nonlinear optimization problem that is difficult to handle with traditional methods. The weight value $w_{i(i=1,2,..n)}$ and the upper triangular matrix element in the modified determination matrix $Y = \{y_{ik} - b_{ik}\}_{n\times n}$ are optimization variables. Optimization variable $n(n+1)/2$. The smaller the $CIC(n)$ value on the left side of Expression 9, the higher the consistency of the decision matrix B. After taking the global minimum, expressions 9 and 8 become true. The judgment matrix B satisfies the complete consistency. According to the constraint condition 10, it is shown that the global minimum $CIC(n) = 0$ is unique. Genetic algorithm can effectively solve the problem of equation 9. Generally speaking, if the matching index coefficient is satisfied, the decision matrix is considered to have sufficient consistency $CIC(n) = 0$, and the weight value of each evaluation index calculated from this is allowed. In other cases, the parameter d needs to be added before the decision matrix is satisfied.

2.2. Sort by Fuzzy Comprehensive Evaluation

Comprehensively analyze multi-factor evaluation and multi-stage evaluation [14], its characteristic is that it can analyze some influencing factors that are difficult to quantitatively analyze through their membership degree and weight, and its mathematical model can be divided into one-level and multi-level.
Set the judgment factor set:

$$Q = q(q_1, q_2, ..., q_i ..., q_n) \tag{11}$$

In the above formula, elements refer to evaluation factors.
Set evaluation plan set:

$$e = (e_1, e_2, ..., e_i ..., e_n) \tag{12}$$

In the above formula, the y_j element refers to the j-th preliminary plan that must be selected for participation.

Create a single factor evaluation matrix. Determine the corresponding fuzzy mapping or function $X \to F(Y)$ according to the inverse relationship between the evaluation coefficient and the evaluation plan: namely:

$$q_i \to r_{i1} / e_1 + e_{i2} / e_2 + ... + e_{ij} / e_j + ... r_{im} / e_m \tag{13}$$

The element r_{ij} in the formula refers to the degree of membership of the influencing factor q_i relative to the scheme q_j. Its value is calculated according to the relational formula determined by the fuzzy mathematical theory, and meets the following conditions:

$$0 \le y_{ij} \le 1 (i = 1,2,...n;\ j = 1,2..., m) \tag{14}$$

$$\sum_{j=1}^{m} y_{ij} = 1 \le r_{ij} \le 1 (y = 1,2,...n;\ j = 1,2..., m) \tag{15}$$

Construct a weight matrix. Set the weight matrix as:

$$A = (u_1, u_2, ...u_i, ..., u_n) \tag{16}$$

Among them, the element represents the weight value that the influencing factor plays in each plan participating in the evaluation to limit the degree of influence, and meets:

$$\sum_{j=1}^{m} u_{ij} = 1 (i = 1,2,..., n) \tag{17}$$

2.3. Double-Elite co-Evolution Genetic Algorithm

In recent years, many scholars have put forward different improvement plans based on the above ideas. A bee evolutionary genetic algorithm is proposed, which simulates the evolution strategy of bees and makes full use of the information of individual elites [15]; According to the co-evolution of the ecological population competition model, co-evolution and genetic algorithms combine well;

elite strategy The M-elite co-evolutionary numerical optimization algorithm combined with co-evolutionary thinking improves the evolution ability of the algorithm. Inspired by the above algorithms, this chapter proposes a dual-elite co-evolution genetic algorithm [16].

(1) Individual evaluation strategy

The difficulty of the co-progressive genetic algorithm is the method to appropriately determine the cooperative relationship between subgroups. This chapter uses two strategies in order to evaluate the fitness of individuals within the group. Degree of difference: The binary code space $\{0,1\}^L$ of the optimization problem is a collection of individuals designed with a combination size of n. The difficulty of the co-progressive genetic algorithm is the method to appropriately determine the cooperative relationship between subgroups.

$$P = \{s_1, s_1, ..., s_n\} \tag{18}$$

The degree of difference between individual s_i and s_j:

$$C(i, j) = \frac{I}{L} \sum_{I=1}^{L} s_{li}, s_{lj} \tag{19}$$

Respectively represent the value of the l-th position of the i individual and the j individual. When the bodies i and j are different, it is not difficult to calculate the difference D(i,j)=1. When the bodies i and j are the same, the difference D(i,j)=0. The initial personal evaluation strategy adopted in this chapter is to use the past methods to evaluate the quality of individuals. In other words, the adaptive function completely depends on the objective function itself, and the adaptive function is expressed as F(xi). i is the individual of the population. However, in the past individual evaluation strategies, the diversity of algorithms has dropped sharply, and the convergence speed of algorithms will also increase. In order to deal with the above problems, this chapter designs a second individual evaluation strategy. As shown in the formula 20 [17].

$$F'(x_j) = C(i, j) \times F(x_j) \tag{20}$$

Among them, i represents individuals in other groups except j. The second evaluation strategy is to introduce different degrees of weighting coefficients based on previous evaluation strategies. This strategy can effectively maintain overall diversity, thereby avoiding early convergence problems caused by the lack of effective models. The genetic algorithm calculates the weights more accurately and scientifically, so the fuzzy comprehensive evaluation is only used in the final sorting work.

2.4. Double Elite Evolution Mechanism

The genetic algorithm using elite strategy can solve the problem well. The abstract model of elite evolution is expressed in Figure 2

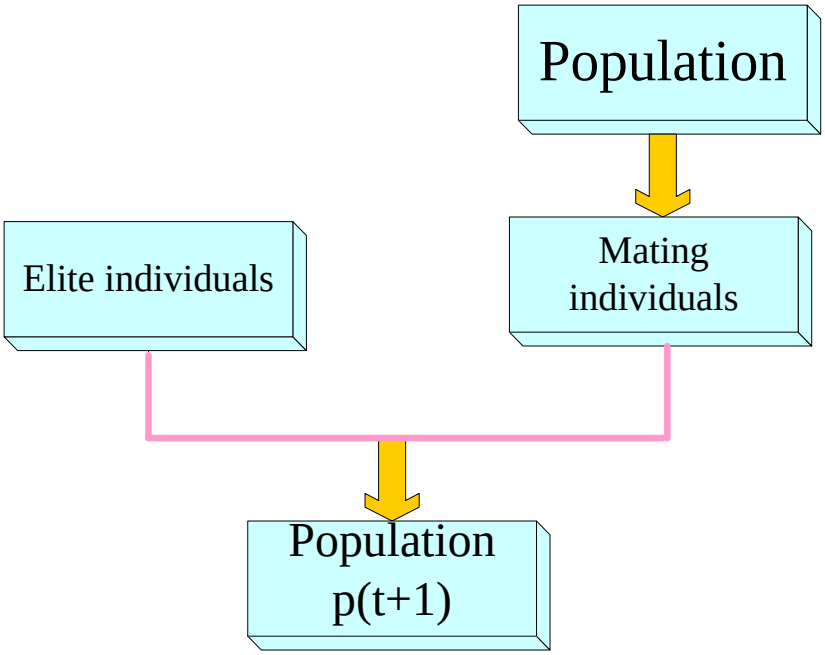

Figure 2. Abstract model

The final network structure is shown in Figure 3. The intermediate hidden layer and the output layer network correspond to the tansig (x, b) and Purelin (x, b) of the MATLAB toolbox, using the hyperbolic tangent signaling transfer function and Purelin transfer function, respectively. The network design is over.

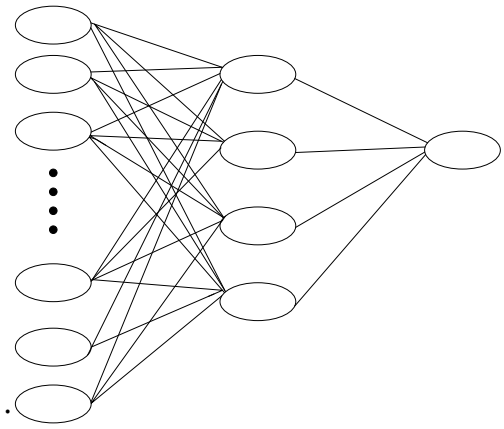

Figure 3. BP neural network structure of urban human settlement environment quality evaluation

When initializing the genetic algorithm to train the neural network, binary coding or real number coding can be used [18]. When the scale of the neural network is large, real number coding can be used. In other words, the direct use of real numbers as the trajectory of the chromosome can greatly shorten the length of the chromosome, not only in the complex encoding and decoding before and after, but also can simplify the operation of genetic factors. Use various cross-over strategies to select various combinations of individuals. This strategy effectively avoids the invalid crossover caused by individuals in groups that are too similar, thereby improving the evolutionary efficiency

of the algorithm. Figure 4 shows the subgroup evolution model centered on EliteA.

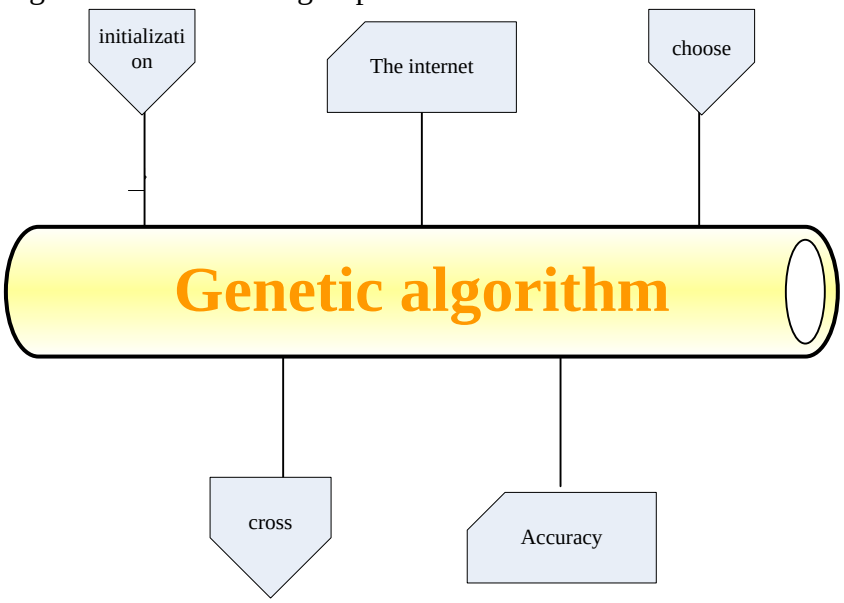

Figure 4. Network model calculation flowchart

Partial overall evolution centered on EliteB the goal of partial overall evolution centered on EliteB is to avoid the problem of early convergence of the algorithm caused by selection pressure [19]. Individuals who are different from EliteA are selected in the elite swimming pool based on the proportional selection method recorded by EliteB. With the increase of evolutionary generations, the diversity of individual groups gradually declines, but now, it is very difficult to maintain the diversity of individual groups only by relying on selection strategies. On this basis, this chapter introduces the random overall randPop. Figure 5 shows the subgroup evolution model centered on EliteB.

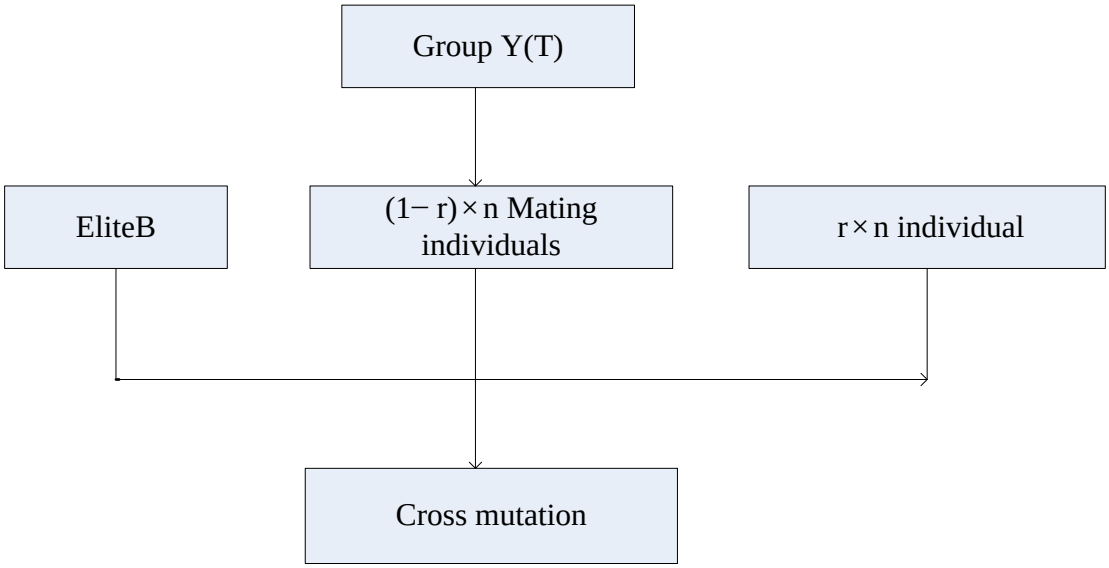

Figure 5. EliteB evolution model diagram

The self-evolution mechanism of the double-elite co-evolution genetic algorithm has been further improved. In order to improve the reliability and adaptability of the algorithm, the reinforcement learning algorithm is suitable for the double-elite co-evolution genetic algorithm [20-21]. Reinforcement learning algorithm is combined with the genetic mechanisms of genetic algorithm, mainly including proportional parameter adjustment strategy, multiple crossover and mutation operation adjustment strategy, crossover and mutation probability adjustment strategy. Experimental results show that these two combinations can better overcome the randomness of genetic algorithm itself, and improve the self-learning ability of genetic algorithm to a certain extent.

3. Experiment and Analysis

3.1. Experiment and Analysis of Improved Genetic Algorithm

In order to test the performance of the MPSGA algorithm based on reinforcement learning, several different experiments are designed. The parameters in the algorithm need to be set before the experiment. The specific setting values are as follows:

Experiment 1 is mainly used to test the optimization effect of the Q-learning algorithm in reinforcement learning on the population proportion parameters. After running 100 times, the MPSGA algorithm based on reinforcement learning can gradually converge to the optimal values of the population proportion parameters X and Y.

Table 1. Function learned by Q-learning algorithm $Z_1 - Z_5$ *optimal population ratio parameter value*

Parameter	Z_1	Z_2	Z_3	Z_4	Z_5
X	0.54	0.36	0.7	0.6	0.58
Y	0.43	0.3	0.2	0.26	0.2

Table 1 is the optimization result of the Q-learning algorithm on the population size parameter of the function $Z_1 - Z_5$. From the results in the table, it can be seen that the value of the proportional parameter X in the breeding population is larger, and it serves as the main population to accelerate the convergence of the algorithm Speed; while the proportional parameter in the reserved population and the global optimal model population is small, it is mainly used to increase the diversity of the population and avoid the algorithm from falling into premature convergence.

Experiment 2 test the performance of the MPSGA algorithm based on reinforcement learning from the two perspectives of the ability to search for the global optimal value and the change of population diversity [22]. The diagram on the left shows the optimal function value that each function converges to, and the diagram on the right shows the population diversity change of each function during the operation of the algorithm. The comparison with the existing algorithm proves the superiority of the algorithm proposed in this chapter:

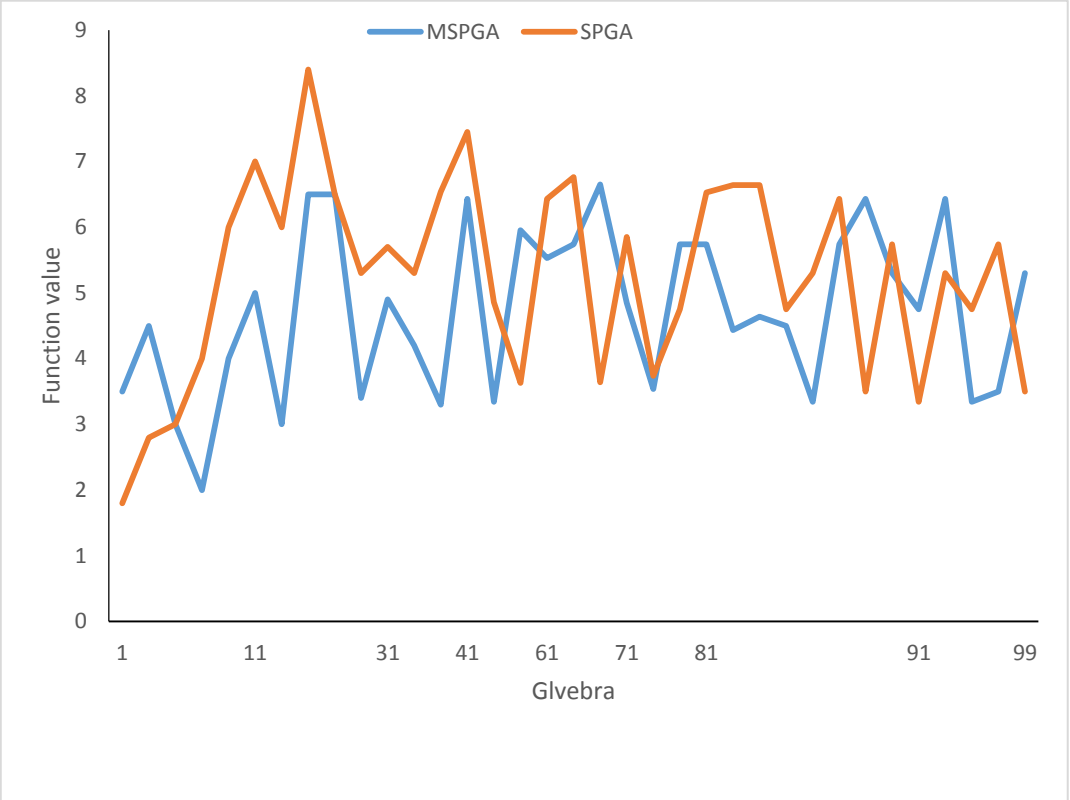

Figure 6. Comparison of function values and diversity changes of MPSGA and SGA to optimization $Z_1 \_ Z_5$

It can be seen from Figure 6 that from the perspective of related numerical retrieval, the MPSGA algorithm can retrieve the global best value with less evolutionary algebra, while the classical genetic algorithm (SGA) can simply be classified as the local best value. In this way, the algorithm will converge early. For example, for the function f1, the MPSGA algorithm can converge to the global optimal solution 0 within 10 generations, but the SGA algorithm can not only converge slowly, but can also be classified as the local optimal. From the perspective of population diversity, the MPSGA algorithm is superior. The diversity of the SGA algorithm that maintains the population is rapidly decreasing and tends to be zero. Generally speaking, the retrieval performance of genetic algorithm has been greatly improved.

3.2. Experiment and Analysis on the Comprehensive Quality Assessment and Investigation Method

For many problems, we cannot use simple fixed scores to judge. Because college students' comprehensive quality has many indicators, it is difficult to evaluate with very accurate results. These indicators have various degrees of ambiguity. We reflect from the opinions of college students, class teachers, student administrators, and experts that in order to obtain more reasonable evaluation results, we must ensure the accuracy and objectivity of the index, and fully participate in the evaluation. Base. The summary of the feedback results of each first-level indicator is shown in Table 2.

Table 2. The weight requirements of different groups on the comprehensive quality evaluation index of college students

		Moral	Scientific culture	Competence	Humanistic qualities	Physical qualities
This quality Ranked First Proportion	College Students	25%	64%	53%	1%	5%
	Teacher	27%	70%	34%	1%	2%
	Manager	38%	72%	28%	1%	4%
	Employer	21%	55%	22%	1%	5%
	average	27.75%	65.25%	34.25%	1%	4%

It can be seen from the data in Table 2 that college students, class teachers, student managers and employers basically agree that the importance of the indicators in the comprehensive quality evaluation index system for college students should be: ①Science, cultural quality, ②Quality of competence, ③ Ideology, moral quality, ④physical and spiritual qualities, ⑤humanity qualities. Thus, we know that comprehensive quality is not taken seriously. We should pay more attention to the comprehensive quality assessment of public security college students.

4. Discuss

This article will explain the basic principles of genetic algorithm, and introduce the implementation mechanism and elements of genetic algorithm in detail. At the same time, it also introduces the theoretical basis of reinforcement learning and provides some commonly used reinforcement learning methods. Drawing lessons from the idea of co-evolution with the elite strategy, a dual-elite co-evolution genetic algorithm is proposed, which theoretically proves the convergence of the algorithm.

This paper takes the early convergence problem caused by the rapid decline of genetic algorithm group diversity as the goal, and proposes a multi-strategy selection strategic genetic algorithm based on reinforcement learning. The algorithm effectively maintains the diversity of groups through a multi-strategy selection method. Prevent the algorithm from converging prematurely. At the same time, the proportional parameters of these three sub-computers will be optimized through reinforcement learning. In this way, the human factor interference to the algorithm will be effectively reduced. Therefore, the algorithm has the advantage of improving autonomy and flexibility. It can show its own superiority in the optimization of complex problems. This reflects the importance of the comprehensive quality of students in public security colleges.

This article also uses the actual investigation method and found that the requirements for the comprehensive quality of public security college students are not high. Therefore, in order to be widely recognized by teachers, parents and the entire society, it is necessary to strengthen publicity and change the concept. In order to succeed in education reform, most teachers are the real implementers and executors of the reform, so we must first understand and get the general support of teachers. At the same time, it must be widely recognized by parents, and only use scores to change the value orientation of talking about high value and low value, and have the correct

foresight of talent and the quality of education.

5. Conclusion

This article mainly starts from the improved genetic algorithm, studies the comprehensive quality assessment of public security college students, discusses the relationship between the two and how to integrate the improved genetic algorithm into the comprehensive quality assessment of public security college students. Based on the improved genetic algorithm, we can know: When determining the evaluation indicators in the comprehensive quality evaluation of students, more reasonable and scientific indicators can be determined through various investigations and studies, application of educational evaluation theories, etc., and multi-level indicators can also be determined to make the research more comprehensive. The comprehensive quality evaluation of public security college students needs to establish an institutionalized and standardized system. The quality of college students can also be evaluated at any time as needed. Only in this way, the university also used the actual investigation method and found that the requirements for the comprehensive quality of public security college students are not high. Therefore, in order to be widely recognized by teachers, parents and the entire society, it is necessary to strengthen propaganda and change the concept. In order to succeed in education reform, most teachers are the real implementers and executors of the reform, so we must first understand and get the general support of teachers.At the same time, it must be widely recognized by parents, and only use scores to change the value orientation of talking about high value and low value, and have the correct foresight of talent and the quality of education. The comprehensive quality evaluation of students can be standardized and institutionalized. It has high reliability and high efficiency as a result of comprehensive quality evaluation of university students and science. The management informationization of college students in public security colleges should be carried out. In order to further improve the comprehensive quality evaluation model of college students, improved genetic algorithm should be used.Based on the improved genetic algorithm,The comprehensive quality assessment involves a wide range of related fields. The author's knowledge and ability are limited. There are still many areas to be improved and learned in the academic field. I will grow up through continuous exploration and do better.

Funding

This article is not supported by any foundation.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

References

[1]Tavakkoli-Moghaddam R , Safari J , Sassani F . Reliability optimization of series-parallel

systems with a choice of redundancy strategies using a genetic algorithm. Reliability Engineering & System Safety, 2017, 93(4):550-556. https://doi.org/10.1016/j.ress.2007.02.009

[2]Volkanovski A , Mavko B , Bo?Evski T , et al. Genetic algorithm optimisation of the maintenance scheduling of generating units in a power system. Reliability Engineering & System Safety, 2017, 93(6):779-789. https://doi.org/10.1016/j.ress.2007.03.027

[3]Lu W , Jia C , Zuo J . Application of Fuzzy Evaluation in Comprehensive Quality Evaluation of Higher Education Students. International Journal of Emerging Technologies in Learning (iJET), 2021, 16(12):201-201. https://doi.org/10.3991/ijet.v16i12.23327

[4] Xu Yan. Research on the Strategy to Improving the Comprehensive Quality of Higher Vocational College Student Leaders. 2019, 019(003):81-84.

[5] Annamdevula S , Bellamkonda R S . The effects of service quality on student loyalty: the mediating role of student satisfaction. Journal of Modelling in Management, 2016, 11(2):446-462. https://doi.org/10.1108/JM2-04-2014-0031

[6]Richardson J . Student Learning in Higher Education: a Commentary. Educational Psychology Review, 2017, 29(2):1-10. https://doi.org/10.1007/s10648-017-9410-x

[7]Welch, Meredith. Education Pays 2016: The Benefits of Higher Education for Individuals and Society. Trends in Higher Education Series.. College Board, 2016, 4(4):143--156.

[8]Lawrence, J, Schweinhart, et al. Effects of the Perry Preschool Program on Youths Through Age 19. Topics in Early Childhood Special Education, 2016, 5(2):26-35.

[9]Ding Z J , Liu J J , Sun Y Q , et al. A Transaction and QoS-Aware Service Selection Approach Based on Genetic Algorithm. IEEE Transactions on Systems, Man, and Cybernetics: Systems, 2017, 45(7):1-1.

[10]Yoshitomi Y , Ikenoue H , Takeba T , et al. Genetic Algorithm In Uncertain Environments For Solving Stochastic Programming Problem. Journal of the Operations Research Society of Japan, 2017, 43(2):266-290. https://doi.org/10.15807/jorsj.43.266

[11]Qiang L , Wu C . A hybrid method combining genetic algorithm and Hooke-Jeeves method for constrained global optimization. Journal of Industrial & Management Optimization, 2017, 10(4):1279-1296.

[12] Do N , Nielsen I E , Gang C , et al. A simulation-based genetic algorithm approach for reducing emissions from import container pick-up operation at container terminal. Annals of Operations Research, 2016, 242(2):285-301.

[13]Gong DW , Jing S , Miao Z . A Set-Based Genetic Algorithm for Interval Many-Objective Optimization Problems. IEEE Transactions on Evolutionary Computation, 2018, 22(99):47-60. https://doi.org/10.1109/TEVC.2016.2634625

[14]AZA , BRA , CMR , et al. Computer aided decision making for heart disease detection using hybrid neural network-Genetic algorithm - ScienceDirect. Computer Methods and Programs in Biomedicine, 2017, 141(C):19-26.

[15]Rashid M A , Khatib F , Hoque M T , et al. An Enhanced Genetic Algorithm for Ab Initio Protein Structure Prediction. IEEE Transactions on Evolutionary Computation, 2016, 20(4):627-644.

[16]Hiassat A , Diabat A , Rahwan I . A genetic algorithm approach for location-inventory-routing problem with perishable products. Journal of Manufacturing Systems, 2017, 42(Complete):93-103. https://doi.org/10.1016/j.jmsy.2016.10.004

[17]Ramos Ruiz G , Fernandez Bandera C , Gomez-Acebo Temes T , et al. Genetic algorithm for building envelope calibration. Applied Energy, 2016, 168(apr.15):691-705.

[18]Li J , Zhang Q , Ke W , et al. Optimal dissolved gas ratios selected by genetic algorithm for

power transformer fault diagnosis based on support vector machine. IEEE Transactions on Dielectrics & Electrical Insulation, 2016, 23(2):1198-1206. https://doi.org/10.1109/TDEI.2015.005277

[19]Philippe, Bouchilloux, Kenji, et al. Combined Finite Element Analysis - Genetic Algorithm Method for the Design of Ultrasonic Motors. Journal of Intelligent Material Systems and Structures, 2016, 14(10):657-667.

[20]Yu Z , Cui H , Sun X . Genetic-algorithm-optimized wideband on-chip polarization rotator with an ultrasmall footprint. Optics Letters, 2017, 42(16):3093. https://doi.org/10.1364/OL.42.003093

[21]Panday A , Bansal H O . Energy management strategy for hybrid electric vehicles using genetic algorithm. Journal of Renewable & Sustainable Energy, 2016, 8(1):741-646. https://doi.org/10.1063/1.4938552

[22] Song B , Wang Z , Li S . A new genetic algorithm approach to smooth path planning for mobile robots. Assembly Automation, 2016, 36(2):138-145. https://doi.org/10.1108/AA-11-2015-094