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Research Article

Biomedical Disabled Rehabilitation Analysis considering Fuzzy Parameter Adaptive PID Algorithm

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Fuzzy parameter adaptation refers to an idea of adjusting parameters based on parameter deviation, deviation change rate and the relationship between the parameters. The PID control algorithm incorporates three algorithms: ratio, sigma, and lead. It is one of the most commonly used algorithms and has a wide range of applications. Embedded system is an application-centric computer system based on modern computer technology that can be flexibly dedicated according to user needs. Although it is convenient to use, it cannot perform large-scale operations and storage. This article aims to explore the role of fuzzy parameter adaptive PID algorithm in the rehabilitation of biomedical persons with disabilities. It is hoped that modern technology will be used to find a new direction for the rehabilitation of the disabled, so that the disabled can better survive in the society. This paper studies the existing classic real-time scheduling algorithms and traditional adaptive scheduling algorithms and analyzes their shortcomings when applied to embedded systems; when sorting out related concepts, clarified related concepts such as disabled persons, to provide tertiary level study for people at risk and higher education policies for persons with disabilities; it combines classic and fuzzy control to form fuzzy self-adaptation, realizes fuzzy self-adaptive control of the temperature value of high temperature sterilization, and improves the automation level of the system. The experimental results of this article show that 68 persons with disabilities need medical diagnosis, accounting for 52%; 15 persons with disabilities need physical correction, accounting for 12%; 29 persons with disabilities require acupuncture treatment, accounting for 22%; 18 persons with disabilities were in mental treatment, accounting for 14%; 57 people lost the ability to learn due to memory decline, accounting for 44%; 46 people were unable to learn due to physical disabilities, accounting for 35%; but there were still 17 people who were able to study normally, accounting for 13% of the total number of people surveyed; 10 people were unable to study due to other reasons, accounting for 8%.

1. Introduction

As a disadvantaged group, the disabled are unable to participate in normal social activities due to various defects and physiological reasons, unable to maintain their basic lives, and need help from the society. Data from previous surveys show that the general causes of disability are divided into four categories: genetic developmental disorders, disease damage, accidental trauma, and other unknown causes. And with the development of society, the proportion of disease damage and accidental trauma is constantly increasing. With the entry into force of the Convention on the Rights of Persons with Disabilities, China has the responsibility and obligation to pay attention to and protect the basic rights of persons with disabilities and to promote social development. According to the survey, as of 2017, the number of poverty-stricken persons with disabilities registered by the state was still more than 2.81 million, and severe disabilities accounted for a large proportion of up to 50%; the distribution range was scattered, and the proportion of poverty-stricken areas was high. From the overall survey results, the structure of persons with disabilities has undergone changes to varying degrees along with social development, and the risk of

disability has gradually increased. Whether the legal rights and interests of the disabled are guaranteed is an important indicator of the country's stable development. Rehabilitation services for the disabled can effectively improve the health of the disabled and improve their living conditions, which is an important manifestation of the superiority of the socialist system. The main function of rehabilitation is to help the disabled recover their physical functions, and to improve the self-care ability and social adaptability of the disabled as much as possible, so as to help the disabled better adapt to social life. With the "people-oriented" concept gaining popularity, people with disabilities are getting more and more attention from the society. The government is also paying more and more attention to the cause of the disabled, and investing in medical rehabilitation for the disabled is also increasing. However, relevant experience continues to be particularly enriched, and it is still necessary to continue to explore effective methods.

The development of persons with disabilities is an important indicator to measure the length of a country's civilization. This can not only help persons with disabilities improve their living conditions, but also better implement the "people-oriented" concept. And it helps to promote the development of the cause of socialism with Chinese characteristics, which is an inevitable pursuit of practicing the core values of socialism. Through the professional knowledge and skills of social work, help the disabled to solve problems, improve the quality of life, help the disabled solve the difficulties in life, stimulate the potential of the disabled, and let them see their strengths more clearly and correctly.

Although all sectors of society have paid more attention to the disabled in the past few years, the corresponding work has also been continuously improved. However, due to a large population of people with disabilities, the wide distribution, the late exploration time, and the incomplete relevant systems, it is necessary to explore more scientific methods to make up for the shortcomings of the current work [1]. Chang et al. presents a neural-network-based gain update algorithm for proportional integral derivative (PID) converters. It enhances processing performance and productivity by tuning the PID gain in order to optimise the profiling angle in practice. Unlike traditional PID gain update algorithms based on tracking accuracy, this algorithm is based on profiling angle, making it more relevant to face-to-face applications on machine-tool. In addition, the contour-error-based approach allows for a scalar expression of the system error, thereby significantly reducing the amount of computation required. This is in contrast to conventional neural-network-based gain adjustment algorithms, which typically require two neural networks per axis to automatically update the PID gain. The proposed algorithm can use a single neural network to update the gain of a multi-axis system [2]. Ochoa et al. used a new method to improve the speed of adaptive processing of dynamic parameters in differentiated evolutionary methods, which was proposed by Karnik and Mendel (KM) and which has an enhanced version called EKM and continuous versions called CKM and CEKM. In addition, there are these and other kinds of variants which cancel out the typological simplification process and thus reduce the computational cost to the first class going Fuzzification [3]. Valdez and Peraza described the methods and equations used to construct triangular and Gaussian interval membership functions and applied this method to the baseline implementation of a zone 2 ambiguous logic controller for the optimisation of a benchmark control problem. In order to verify the effects of uncertainty in an optimal way, the authors used noisy (pulse generator) and noiseless experiments. In addition, a statutory Z-test is proposed to check the validity of the suggested approach. The author's major contribution is the proposal to dynamically adjust the parameters of the harmony search algorithm using a theory of interval 2 fuzzy logic, which is then applied to the optimal design of interval 2 fuzzy logic controllers [4]. Song and Lee tried to provide more useful information about policy interventions, not just the simple causal relationship between these variables, by testing the exchange model that assumes that the socioeconomic status and life satisfaction of persons with disabilities have an interaction. To this end, the author used the 6th to 8th data of the Disability Employment Panel to analyze 2906 people except for the missing data. The analysis results show that socioeconomic status and life satisfaction show a strong autoregressive effect, confirming that there is an exchange relationship between socioeconomic status and life satisfaction. In addition, variables such as basic living conditions, economic activities, and type of house ownership as control variables have been found to be factors affecting socioeconomic status and life satisfaction. Based on the results of this research, the authors discussed the policy direction to improve the socioeconomic status and life satisfaction of the disabled [5]. Diallo et al. investigated the effect of live theater performance intervention on improving pre-service rehabilitation students' attitudes towards persons with disabilities. A convenient sample of 54 undergraduates of Latino descent ranged in age from 18 to 24 years old. The Disability Attitude Scale collects data on students' attitudes towards the disabled and data on the degree of happiness in using the Like Scale. The purpose of Park's research is to examine the characteristics of the economic activities of young people with disabilities, and to make recommendations on what measures should be taken to promote them to find a job [6]. Although there are serious problems among young people with disabilities, Korean society has not paid serious attention to the problem. This study specifically analyzes the economic activities and work characteristics of these people, as well as the factors that affect their employment. The results are as follows: compared with the entire generation of people of the same age, disabled youths are not financially active enough, and their jobs are not good enough. Factors affecting their job search include age, education, whether they are recipients of basic living security, whether they are the head of the household, and the type of disability. The older the age, the

higher the probability of finding a job. In terms of academic qualifications, junior high school graduates and high school graduates are less likely to be employed than graduates who have received college or higher education. The employment rate of young- and middle-aged people receiving basic living security is lower than that of unreceived young- and middle-aged people, and the probability of employment of household heads is higher than that of nonregistered young- and middle-aged people. Compared with people with physical disabilities, people with mental disabilities are more likely to find jobs. According to the research results, it is recommended how to increase the employment of disabled youth [7]. Moody et al. aimed to explore the views and needs of stakeholders in adapting to the needs of employees with disabilities in the workplace, and 480 participants from six countries completed an exploratory online survey. Experimental analysis shows that the workplace can be further improved to meet the needs of employees, and considerable training can be conducted within the company to increase awareness of employee needs, employer obligations, and workplace adaptation. The results also show that there is still a gap between the intention of workplace inclusiveness and reality, and further strategies are needed to improve the opportunities for disabled employees [8]. Although these theories have analyzed the fuzzy parameter adaptive PID algorithm and the rehabilitation of the disabled to a certain extent, the correlation between the two is less and not practical.

This paper combines fuzzy parameter adaptive PID algorithm with the rehabilitation of biological disabled for the first time, filling up the deficiencies of previous investigations. Based on the investigation, it has applied different methods for data analysis, which can deeply explore the current rehabilitation needs of the disabled. And it can put forward specific countermeasures to provide theoretical support for the rehabilitation training of the disabled.

2. Methods

2.1. Overview of Fuzzy Control. Fuzzy control actually converts the knowledge and experience of the staff into language rules, and then undergoes fuzzy processing to realize the control process of the complex system. The difference between a fuzzy control system and a conventional automatic control system is: its core is a knowledgeable and intelligent fuzzy controller. Fuzzy control belongs to the automatic control system. It forms a set of control system based on fuzzy mathematics, fuzzy language knowledge representation and fuzzy logic rule reasoning to control specific objects [9, 10]. In order to improve the accuracy of the system and grasp the change characteristics of the controlled object in time, the observed change values are often input into the system to form feedback data [11]. From this level, the fuzzy control system also belongs to the intelligent control system. Fuzzy control system usually consists of five parts: fuzzy controller, input/output interface, actuator, controlled object, and measuring device. Its specific structure is shown in Figure 1:

Fuzzy control does not need to rely on precision instruments in the specific operation process, it is suitable for complex systems and fuzzy objects, and it can improve the operation ability through continuous learning and updating experience [12]. The core of the fuzzy control system is the fuzzy controller. The fuzzy controllers are all based on computers (microcomputers, single-chip computers, etc.,), so, they have the characteristics of a computer control system; it is easy to master and learn for a staff who have certain operating experience but are not familiar with control theory.

In most of the current production areas, control systems are equipped with automation functions. This type of controller is simple in principle, convenient to operate, and has very strong applicability. It is not sensitive to the characteristics of the controlled object and does not need to frequently change the parameters of the control system [13, 14]. However, due to the continuous improvement of the production level and the uncertainty of the control system, the parameter setting still does not realize the automatic change function. This caused a lot of trouble to the production work, and required the staff to change actively, and the production effect could not be guaranteed. In order to adapt the control system to the needs of social production, the control system must be improved [15]. This paper proposes a fuzzy control system based on expert control, which combines fuzzy control with PID to automatically modify parameters and improve production effects [16]. Fuzzy control systems can make better predictions for many complex problems and find out appropriate methods to solve them. In addition, the expert system of fuzzy control does not need to know the mathematical model of the controlled system, but can work normally by using the knowledge and experience known by the expert. Its specific structure is shown in Figure 2:

2.2. PID Algorithm. PID is the abbreviation of proportional, derivative, and integral, and it is a commonly used control method in the production process. The principle frame diagram is shown in Figure 3:

$$y(o) = Q_h\left(a(o) + \frac{1}{W_h}\int_0^2 a(o)do + W_d\frac{\mathrm{d}a(o)}{\mathrm{d}o}\right). \quad (1)$$

Among them, $a(o)$ represents the deviation, and $y(o)$ represents the control output value.:

$$\frac{\mathrm{d}a(o)}{\mathrm{d}o} = \frac{a(qO) - a(q-O)}{O} = \frac{a(q) - a(q-1)}{O}. \quad (2)$$

It simplifies $a(qO)$ to $a(q)$, and we can get:

$$y(o) = Q_h\left(a(o) + \frac{W}{W_h}\sum_l^o a(l)do + \frac{W_d}{W}(a(o) - a(o-1))\right), \quad (3)$$

where Q represents the sample number, and $y(o)$ represents the output value of the qth sample.

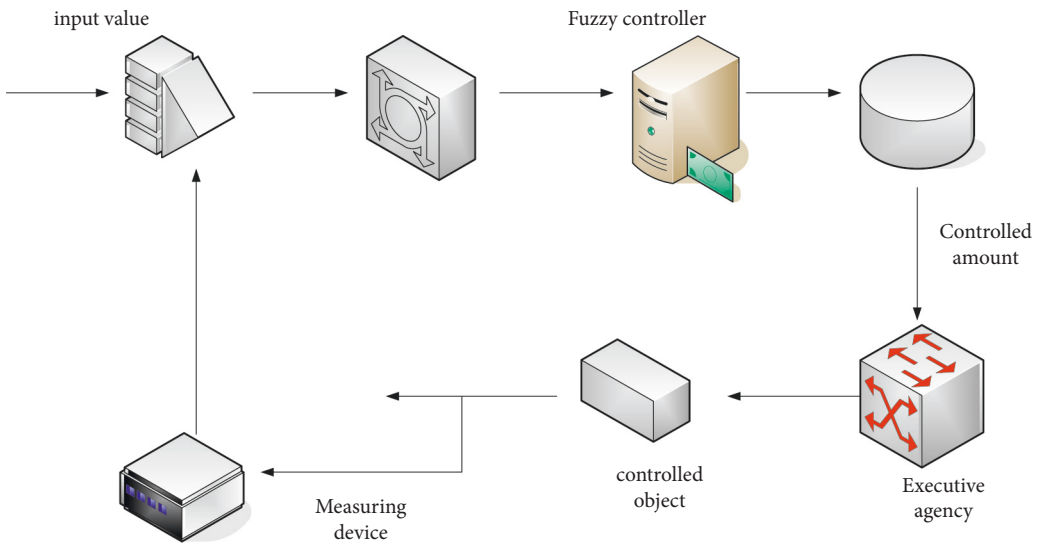

Figure 1: Fuzzy control system structure.

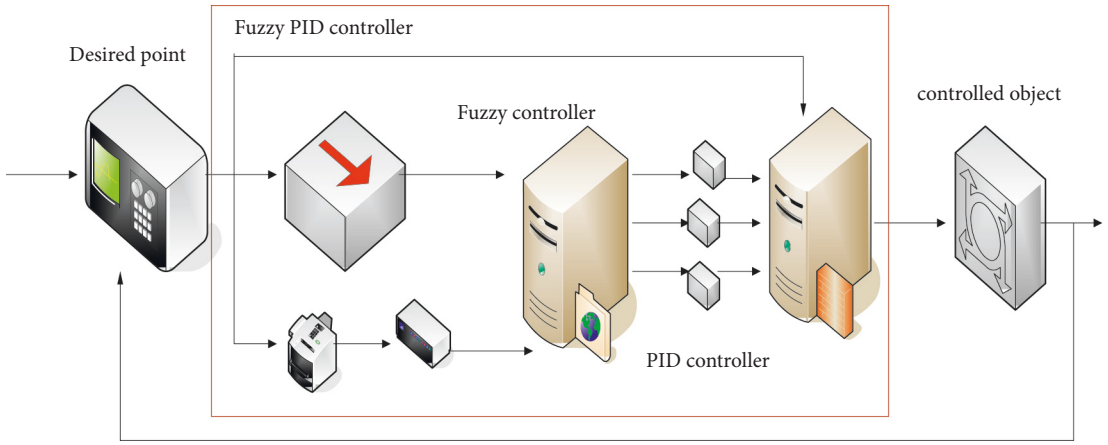

Figure 2: Improved fuzzy control system.

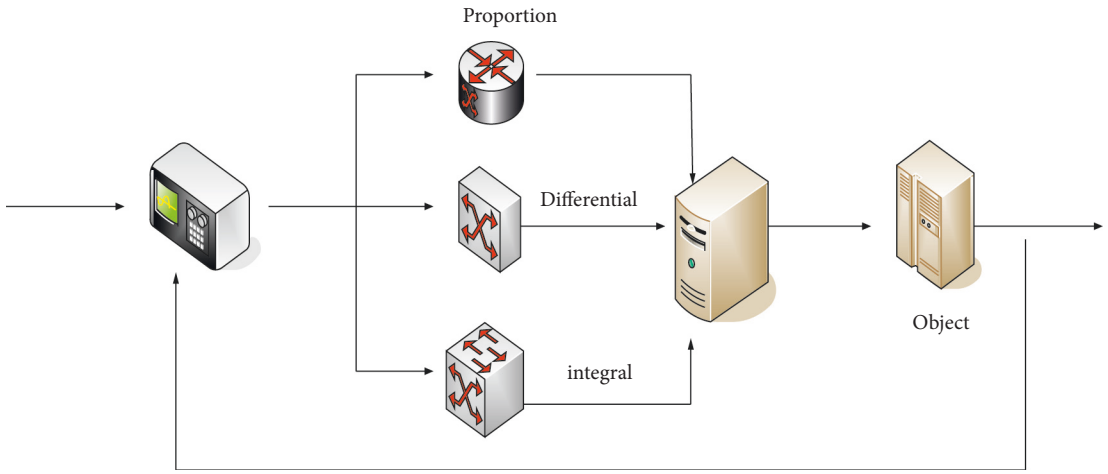

Figure 3: Block diagram of PID control principle.

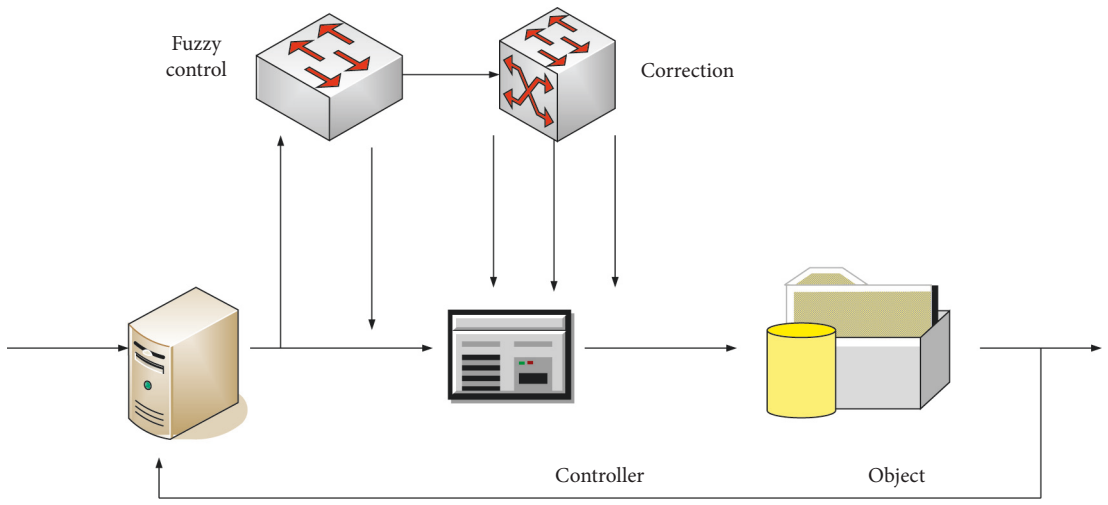

Figure 4: Fuzzy adaptive control system.

The fuzzy adaptive control system is composed of PID controller and control link, connected with the signal conversion mechanism, and then the analytic signal is input into the controller and control link, and finally the calibration value is obtained [17]. Figure 4 is a diagram of the fuzzy adaptive control system:

$$\begin{aligned} a &= w_1(\partial(w) - \partial(w-1)), \\ at &= w_2(a(w) - a(w-1)). \end{aligned} \tag{4}$$

Among them, w_1, w_2 represent the angle deviation.

$$\Delta L^* = \sum(\Delta L(\Delta L_i) * \Delta L_i) / \sum \Delta L(\Delta L_i). \tag{5}$$

Among them, ΔL^* represents the exact value, ΔL_i represents the fuzzy value, and $\Delta L(\Delta L_i)$ represents the membership value. The basic principle of fuzzy controller reasoning is that when the deviation is large, the system parameters should be larger in order to make the system have better fast-tracking performance. At the same time, in order to avoid system overshoot, the integral action should be restricted.

$$\begin{aligned} W_h &= W_{h0} + L1 * \Delta L_h, \\ W_f &= W_{f0} + L2 * \Delta L_f, \\ W_g &= W_{g0} + L3 * \Delta L_g. \end{aligned} \tag{6}$$

Among them, L_1, L_2, L_3 represent the parameter correction value.

$$u(a) = \int_{-\infty}^{\aleph} g(a-\alpha) j(\alpha) d\alpha = \int_{-\infty}^{\aleph} g(a) j(a-\alpha) d\alpha. \tag{7}$$

Among them, $j(a)$ and $u(a)$ represent the input and output values.

$$u(i) = \sum_{l}^{\infty} g(l)\alpha(i-l) = \sum_{l}^{\infty} g(i-l)\alpha(l). \tag{8}$$

$u(i)$ represents the discrete output value.

$$\begin{aligned} u(a) &= \int_{-\infty}^{a} g(a-\alpha) j(\alpha), \\ d\alpha &= \int_{0}^{\aleph} g(a) j(a-\alpha) d\alpha, \end{aligned} \tag{9}$$

$$u(i) = \sum_{l}^{i} g(l)\alpha(i-l) = \sum_{0}^{\infty} g(i-l)\alpha(l). \tag{10}$$

Formula (9) and formula (10) represent $a < 0$, $g(a) = 0$.

$$u(a) = \int_{-\infty}^{\infty} g(a,\alpha) j(\alpha) d\alpha, \tag{11}$$

where $g(a,\alpha)$ represents the impulse response of the system.

$$u(i) = \sum_{k=0}^{M} c_k j(m-k) - \sum_{k=1}^{S} d_k p(m-k). \tag{12}$$

Among them, $j(m)$ represents the input sequence, $u(i)$ represents the output, and c_k and d_k represent the coefficients.

$$\begin{aligned} u(i) = {} & c_0 j(m) + c_1 j(m-1) + \cdots + c_S j(m-S) \\ & - d_1 p(k-1) - d_2 p(k-2) - \cdots - d_h p(k-h). \end{aligned} \tag{13}$$

The formula (13) represents the expanded value of the formula (12).

$$\begin{aligned} u(q) = {} & c_0 j(q) + c_1 q^{-1} j(q) + \cdots + c_q j(m-q) - d_1 p(q-1) \\ & - d_2 p(q-2) - \cdots - d_h p(q-h). \end{aligned} \tag{14}$$

(14) represents the q conversion under the initial conditions.

$$W(q) = \frac{u(q)}{c(q)} = \frac{c_0 + c_1 q^{-1} + \cdots + c_m q^{-m}}{1 + d_1 q^{-1} + \cdots + d_m q^{-m}}. \tag{15}$$

At this time, $q = m$.

$$W(q) = \frac{c_0 q^m + c_1 q^{m-1} + \cdots + c_m}{q^m + d_1 q^{m-1} + \cdots + d_m} = R \prod_{k=1}^{m} \frac{q - q_k}{q - h_k}. \quad (16)$$

Formula (16) is a conversion formula of formula (15).

$$u(i) = c_0 j(m) + c_1 j(m-1) + c_2 j(m-2) - d_1 p(k-1) - d_2 p(k-2), \quad (17)$$

where $u(i)$represents the output value of the second-order filter. Filtering is a signal processing operation whose purpose is to process a signal in order to use the information contained in the signal. The output structure is shown in Figure 5:

Embedded System: embedded system is a computer system that exists inside the system to assist in fulfilling certain requirements. Embedded system can be defined as a dedicated computer system with application as the center, computer technology as the foundation, software and hardware tailoring, and strict requirements on function, reliability, cost, volume, and power consumption. The current digital information technology is in a stage of rapid development, and embedded systems are also widely used in various production fields [18, 19]. Due to the continuous improvement of social production requirements, the requirements for various equipment in the production field are becoming more and more stringent. These practical needs are forcing the continuous optimisation and upgrading of embedded systems [20]. The earliest embedded systems only had a single function and could not meet the requirements of multiple controls. In order to meet production needs, the embedded system introduced an operating system, which is our common embedded operating system. The addition of the operating system makes the operation easier, the system more stable, and it can be applied to multi-task control to improve work efficiency [21]. The embedded operating system uses a dedicated embedded CPU, which usually has low power consumption, small size, and high integration; it has real-time requirements; and the system is transparent to users. Figure 6 shows the adaptive control structure of the embedded operating system:

Higher education for persons with disabilities: education for the disabled is an important part of special education. In a broad sense, special education includes education for special talents such as poor morals, physical disabilities, and superior intelligence. In a narrow sense, special education refers to education for the disabled, and this article discusses special education in a narrow sense. Higher education for persons with disabilities refers to the process by which persons with disabilities receive higher education, and there is currently no academic definition. Higher education for persons with disabilities should include the following content. The object of education is persons with disabilities who have obtained higher education qualifications; higher education is advanced professional education, which teaches advanced knowledge, and can adopt various forms to cultivate high-level talents. Some researchers define higher education for persons with disabilities as special education above secondary education, but this view is generally not adopted in society. With the advent of the era of knowledge economy, society has an increasing demand for high-level visits, and competition among individuals has become increasingly fierce. If people with disabilities want to realize their own value, they must continuously improve their education level. The higher the level of education, the more opportunities and the stronger one's own ability. Therefore, higher education is a necessary way to improve one's own ability, which also expands the production space of the disabled and objectively promotes social development. The development of higher education for persons with disabilities is an inevitable result of the democratization and modernization of education; the development of higher education for persons with disabilities contributes to the construction of social material and spiritual civilization; the development of higher education for persons with disabilities makes the concept of education fairness a reality.

3. Experiment Analysis

Basic situation of persons with disabilities: through the investigation of the status quo of the disabled in District B of City A, we can understand the status quo of the disabled and their rehabilitation needs. This experiment took the form of issuing questionnaires to collect data. In this experiment, 150 questionnaires were issued and 130 questionnaires returned, with an effective rate of 86%.

According to the data in Table 1, we divided the surveyed population into five groups. Among them, there are 13 people with disabilities under 15 years old, accounting for 10%; 11 people with disabilities between 16 and 30 years old, accounting for 8%; 27 people with disabilities between 31 and 45 years old, accounting for 21%; there are 37 persons with disabilities aged 46–55, accounting for 29%; there are 42 persons with disabilities over 55, accounting for 32%. According to the recovered data, the proportion of people over 55 years old is the highest, and the number of people with disabilities between 16 and 30 years old is the least.

According to the data in Table 2 and the disability regulations, among the disability groups surveyed, there were 47 persons with level 4 disability, accounting for 36%; and 50 persons with level 3 disability, accounting for 38%; there were 20 people with level 2 disability, accounting for 16%; 43 people with level 1 disability, accounting for 10%. According to the recovered data, the number of disabled persons at level 3 is the highest, and the number of disabled persons at level 1 is the least.

According to the data in Table 3, we have divided the categories of disabilities into seven categories. Among them, there were 17 people with intellectual disabilities, accounting for 13%; 61 people with physical disabilities, accounting for 47%; 7 people with visual disabilities, accounting for 5%; and 13 people with mental disabilities, accounting for 10%; there were 9 people with language disabilities, accounting for 7%; the number of hearing disabilities is 12, accounting for 9%; the number of other types of disabilities is 11, accounting for 9%. According to the recovered data, the number of physically disabled is the most, followed by the number of visually disabled, and the number of visually disabled is the least.

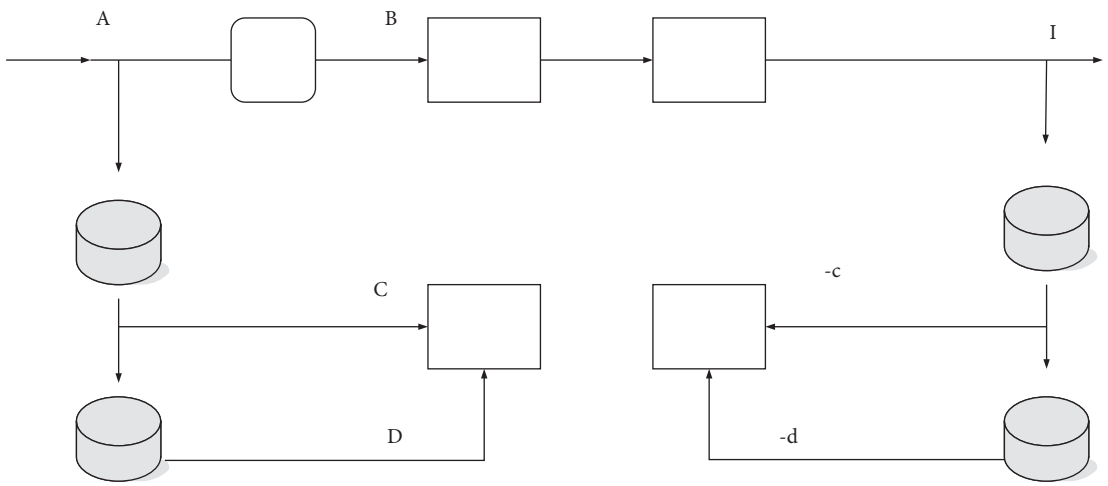

Figure 5: Output structure of the second-order filter.

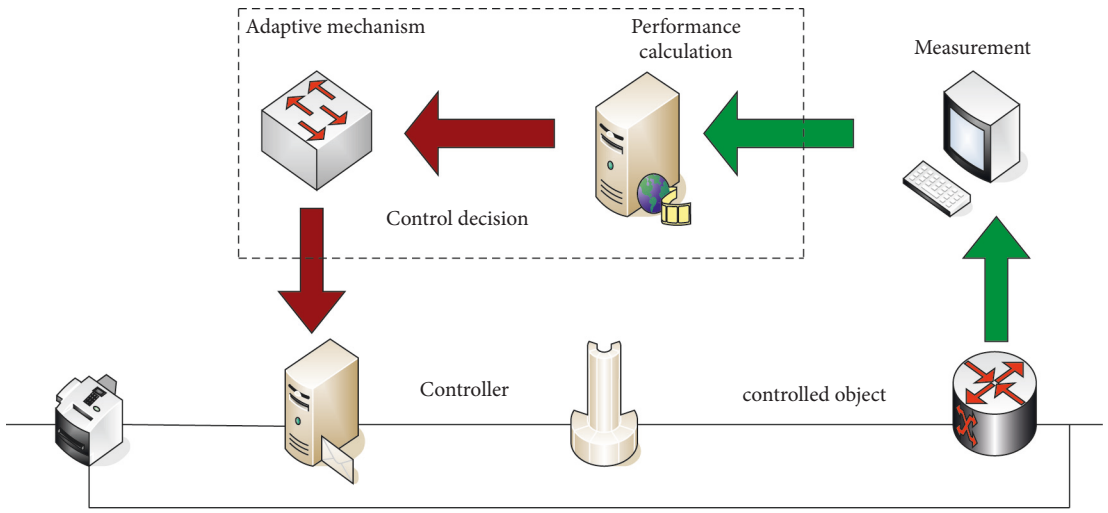

Figure 6: Adaptive control structure of embedded operating system.

Table 1: Age composition.

Category	Number of people	Proportion (%)
Less than 15 years old	13	10
16–30 years old	11	8
31–45 years	27	21
46–55 years	37	29
Older than 55	42	32
Total	130	100

Table 2: Disability levels.

Category	Number of people	Proportion (%)
Level 4	47	36
Level 3	50	38
Grade 2	20	16
Grade 1	13	10
Total	130	100

Table 3: Composition of categories of persons with disabilities.

Category	Number of people	Proportion (%)
Intellectual disability	17	13
Physical disability	61	47
Visual disability	7	5
Mental disability	13	10
Speech disability	9	7
Hearing disability	12	9
Other disabilities	11	9
Total	130	100

According to the data in Table 4, this experiment divided the causes of disability into 6 types, among which 25 people were congenital disabled, accounting for 19%; 58 people were disabled by disease, accounting for 45%; there were 6 people who are disabled by poisoning, accounting for 5%; 4 people who were genetically disabled, accounting for 3%; 20 people who were disabled by accidents, accounting for 15%; 17 people were disabled due to other reasons, accounting for

Table 4: Investigation of causes of disability.

Category	Number of people	Proportion (%)
Congenital	25	19
Disease	58	45
Poisoning	6	5
Heredity	4	3
Accident	20	15
Other	17	13
Total	130	100

13%. According to the survey data, the number of people with disabilities caused by disease is the largest, and the probability of disease caused by childhood disease is the largest. Therefore, special attention should be paid to the diagnosis and treatment of children's diseases. Figure 7 is a schematic diagram of the cause and proportion of disability:

The PID algorithm has an auto-deflection function, which controls the range of errors and moves the target object in a more scientific direction. People with disabilities also need to recover through a rational rehabilitation program during rehabilitation. In order to make the disabled person recover scientifically, we compared the PID algorithm with the programs developed by other methods.

According to the data in Table 5, it can be seen that by analyzing the error of different calculation methods on the rehabilitation training of disabled people, the error of PID algorithm on the analysis of medical resources is around ±2 sets, but the medical resources detected by other methods are around ±5 sets. Through this method, we can reduce the waste of medical resources; the error of PID algorithm on the cycle of motor training is less than other methods, and the analysis of PID algorithm on the rehabilitation analysis is more accurate, so that we can accurately judge the rehabilitation of disabled people and formulate new rehabilitation methods in time.

4. Result

In fact, except for some special circumstances, most of the disabled people can restore themselves to a good state through rehabilitation training, engage in social activities, and return to society. Figure 8 shows the rehabilitation medical needs of disabled persons in District B of City A:

According to the data in Figure 8, the needs of the disabled for rehabilitation training are manifold. In this experiment, we selected more representative requirements as analysis points. It can be seen from the medical service data in Figure 8(a) that medical diagnosis is the most common rehabilitation method. Only when the cause of disability is diagnosed can the right medicine be prescribed and targeted rehabilitation methods can be adopted. Among the surveyed population, 68 people need medical diagnosis, accounting for 52%; 15 people need limb correction, accounting for 12%; 29 people need acupuncture treatment, accounting for 22%, and 18 people need psychotherapy, accounting for 14%. It can be seen from the medical service data that the number of people who need basic medical diagnosis services is the largest, followed by acupuncture and

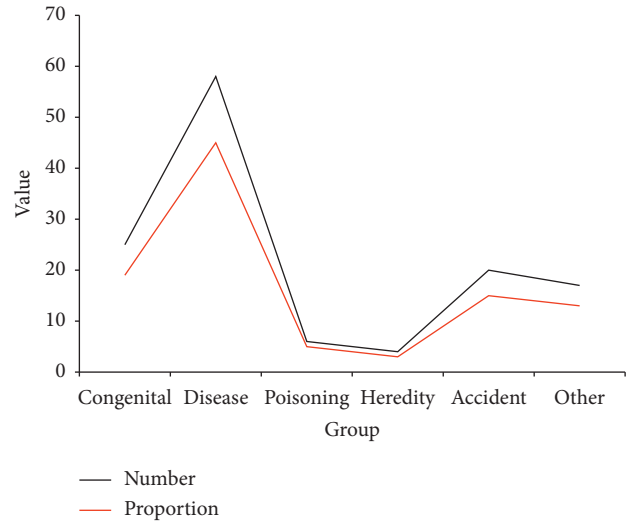

Figure 7: Causes and proportions of disability.

Table 5: Comparative analysis of errors in rehabilitation training for people with disabilities.

Testing points	PID algorithm	Other methods
Medical resources (sets)	±2	±5
Athletic training	±3	±7
Rehabilitation analysis	±4	±6

moxibustion services. From the functional service data shown in Figure 8(b), 80 people need rehabilitation training for walking ability, accounting for 62%; 12 people need vision training, accounting for 9%; 29 people need language training, accounting for 22%, and 9 people need psychological counseling, accounting for 7%. Among them, the people who need walking rehabilitation are the most, followed by language training. From this data, it can be seen that most of the current disabilities are caused by the inconvenience of walking. However, due to the development of society, the competition is becoming more and more fierce, the pressure of survival is increasing, and the psychological problems are also increasing. Therefore, it is necessary to pay attention to psychological counseling and treatment to prevent it from happening.

According to the data in Figure 9, the employment channels of disabled persons are greatly restricted compared with normal people, which may be due to personal reasons or social reasons, such as corporate discrimination. According to the survey data of employment channels in Figure 9(a), most of the jobs of persons with disabilities are introduced by relatives and friends. There are 65 persons of this type, accounting for 50%; there are 32 people who spontaneously look for recruitment opportunities on the Internet, accounting for 25%; 13 people who inherit the family business, accounting for 10%; there are 4 people who start their own businesses, accounting for 3%; there are 16 people involved in other types of employment, accounting for 12%. From this data, it can be seen that the largest employment channel for persons with disabilities is through introductions by others, and fewer people start their own

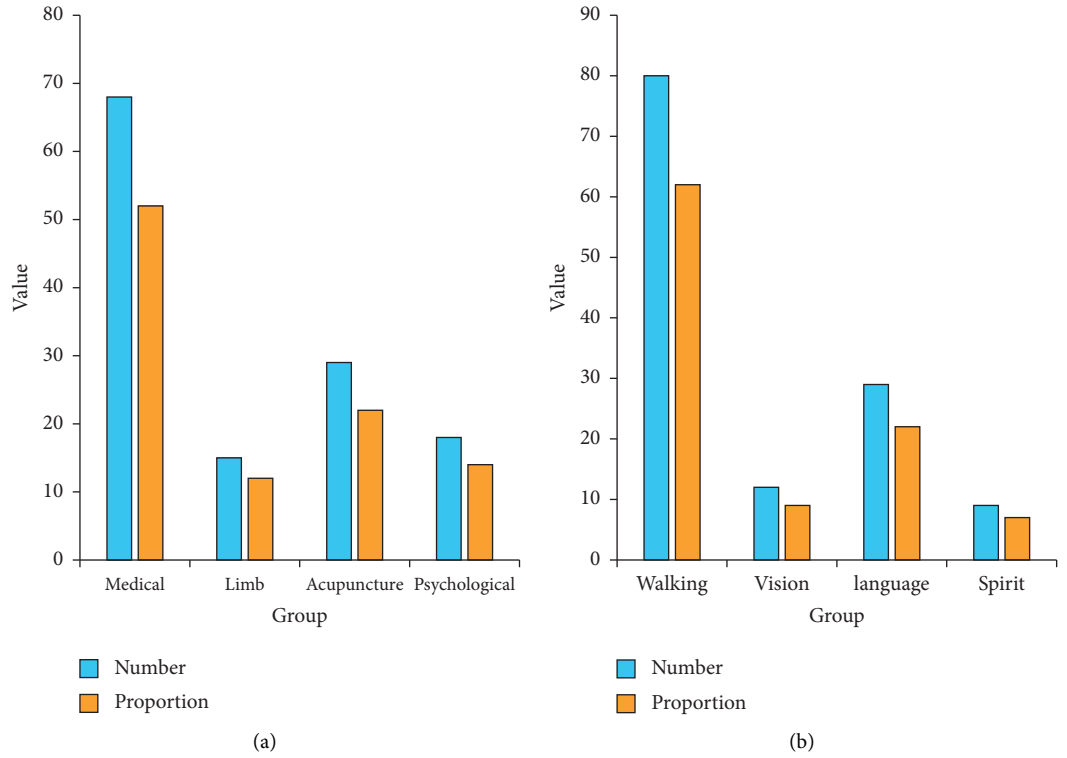

Figure 8: Rehabilitation needs of persons with disabilities. (a) Medical service and (b) functional service.

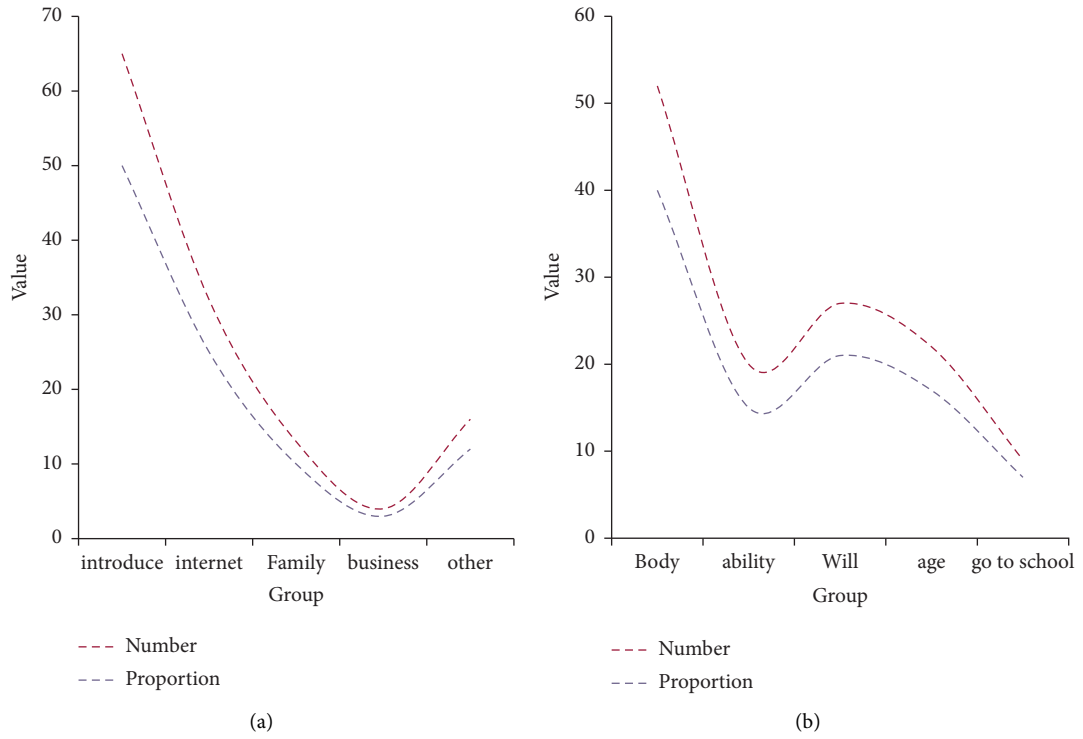

Figure 9: Rehabilitation survey of the disabled. (a) Employment channels and (b) reasons for not working.

businesses. To this end, it is necessary to strengthen the employability of the disabled and strengthen employment training. From the survey data of the reasons for not working in Figure 9(b), it can be seen that 52 people are not allowed to work, accounting for 40%; 20 people are lacking in their own ability, accounting for 15%; there are 27 people who are not willing to work, accounting for 21%; 22 people are too young or too old to work, accounting for 17%; 9 people are in

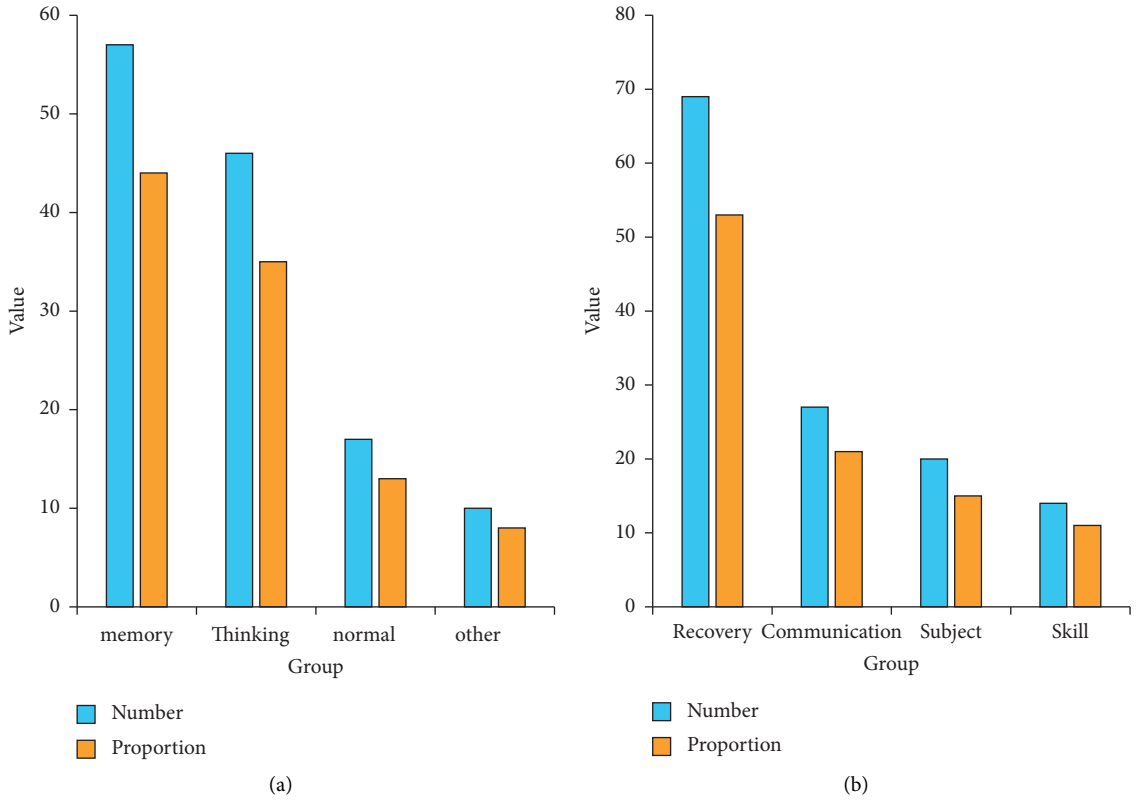

Figure 10: Educational rehabilitation. (a) learning status and (b) learning knowledge.

school, accounting for 7%. From this data, it can be seen that the biggest reason that hinders participation in work is physical condition. For this reason, it is necessary to strengthen medical re-examination and treatment to restore the body to a good condition as much as possible. If it is due to insufficient capacity, relevant agencies should organize skills training to help people with disabilities better participate in employment. Personal willingness accounts for a relatively high proportion of the reasons for not participating in work, which requires ideological guidance to cultivate the consciousness of self-reliance.

Education is the foundation of a nation, and it plays an important role in promoting social development. As an important part of socialist education, education for the disabled has been popularized with the continuous deepening of educational concepts. Participation in education of persons with disabilities can improve themselves and enhance their ability to participate in social construction.

According to the data in Figure 10, there is a big difference between the education status of disabled and normal people. Judging from the learning status of the disabled in Figure 10(a), 57 people who want to learn but lose their learning ability due to memory decline, accounting for 44%; 46 people were unable to study due to physical disabilities, accounting for 35%; but there were still 17 people who were able to study normally, accounting for 13% of the total number of people surveyed; 10 people were unable to study due to other reasons, accounting for 8%. From this data, it can be seen that the injuries caused by disability have a huge impact on education, causing many disabled people to be unable to carry out normal learning activities. From the data in Figure 10(b), it can be seen that among the people who need to learn, 69 people want to learn medical rehabilitation knowledge, accounting for 53%; there were 27 people who need to learn social communication knowledge, accounting for 21%; 20 people who need to learn subject knowledge, accounting for 15%, and 14 people want to reduce family burdens and learn work skills, and this group of people accounts for 11%. The number of people who want to learn medical rehabilitation knowledge is the largest, which shows that people with disabilities desire medical rehabilitation knowledge.

According to the data shown in Figure 11, currently disabled persons are still facing important difficulties in medical rehabilitation. According to the rehabilitation training data in Figure 11(a), 74 people did not participate in the rehabilitation training, accounting for 57%; there were 18 people with disabilities who look at wealth training but no effect, accounting for 14%; 31 people with average rehabilitation training effect, accounting for 24%; 7 people with good rehabilitation effect, accounting for 5%. It can be seen from the data that there are still many people who cannot participate in various rehabilitation training due to various reasons, and the training effect is not obvious. In response to such phenomena, relevant institutions should develop more targeted training methods to improve training effects. From the cost source data in Figure 11(b), it can be seen that there were 107 individuals who need to independently bear the

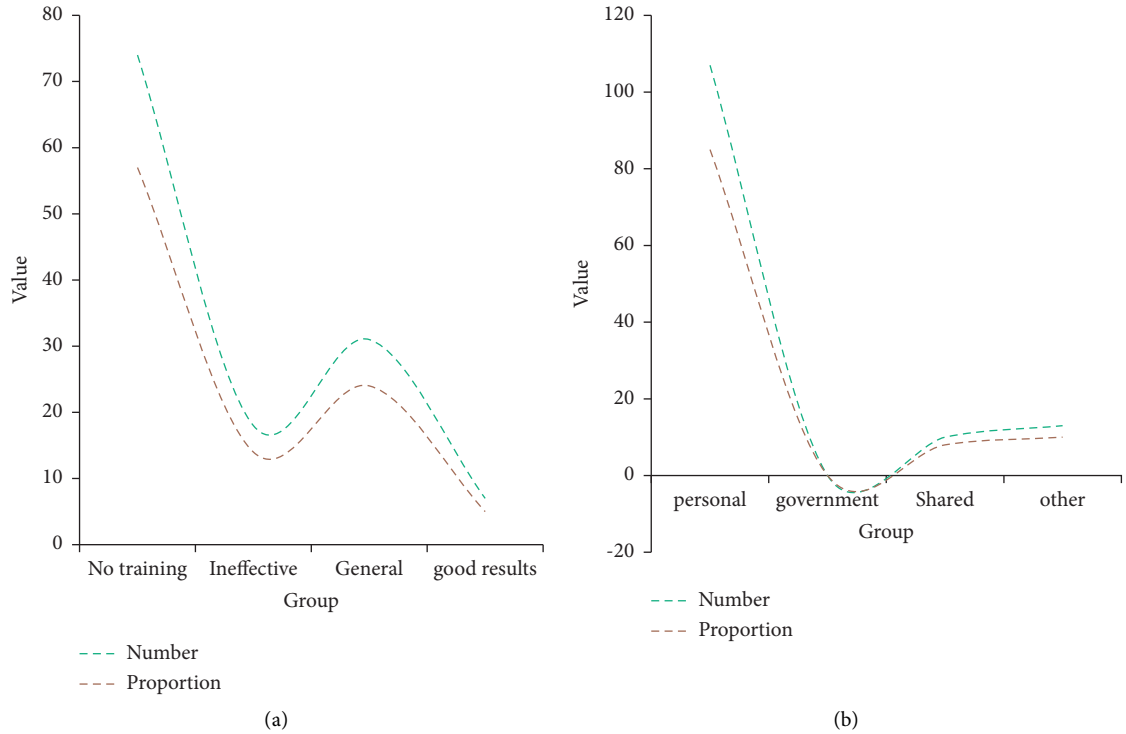

Figure 11: Current status of medical rehabilitation. (a) Rehabilitation training situation and (b) source of expenses.

cost of rehabilitation training, accounting for 85%; there are 0 people who independently bear the cost of rehabilitation training by the government; 10 people share the cost of rehabilitation training by the government and individuals, accounting for 8%; other funds bear the cost of rehabilitation training 13 people, accounting for 10%. From this data, it can be seen that in most of the cases, the cost of rehabilitation training is still borne by the individual. Moreover, the cost of rehabilitation training is relatively large, and the duration is long, and an average family cannot afford it. As a result, most of the people cannot participate in normal rehabilitation training. In response to this situation, the state should include rehabilitation training costs as soon as possible into the scope of medical insurance to reduce the pressure of family rehabilitation training.

5. Conclusions

As a disadvantaged group in society, people with disabilities need to get the attention of the society, whether it is basic life or social employment. In recent years, with the continuous improvement of social civilization, the society has paid more and more attention to the disabled. This article aims to explore the role of fuzzy parameter adaptive PID algorithm in the rehabilitation of biomedical persons with disabilities. It is hoped that modern technology will be used to promote the physical rehabilitation of the disabled and help them to better adapt to society. This article mainly completes the following tasks: (1) it clarifies the relevant concepts of the disabled, higher education for the disabled, and higher education policies for the disabled, and discusses the necessity of developing higher education for the disabled. (2) A brief overview of the fuzzy control system is given, the existing classic real-time scheduling algorithms and traditional adaptive scheduling algorithms are studied, and the shortcomings of its application to embedded systems are analyzed. (3) At present, the cost of rehabilitation training for the disabled is basically borne by the individual, the cost is relatively large, and the effect of rehabilitation training is not obvious.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflicts of interest.

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