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Retraction

Retracted: Research and Application of Combined Algorithm Based on Sustainable Computing and Artificial Intelligence

Mathematical Problems in Engineering

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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[1] B. Hu, "Research and Application of Combined Algorithm Based on Sustainable Computing and Artificial Intelligence," *Mathematical Problems in Engineering*, vol. 2021, Article ID 5567267, 9 pages, 2021.

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Research Article

Research and Application of Combined Algorithm Based on Sustainable Computing and Artificial Intelligence

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The Internet is a popular form of information technology development in the new century, and it organizes and analyzes big data by taking effective measures to find useful information. With manpower, it is obviously not enough to be in such a huge information system, so the emergence of sustainable computing and artificial intelligence has become the core of large-scale data processing at this stage. This paper studies the application of the combined algorithm based on sustainable computing and artificial intelligence. In this paper, a new combined intelligent search algorithm is proposed by combining sustainable computing with artificial intelligence. The combination algorithm firstly analyzes the value from the aspects of ecological environment and economic benefits and studies the overall evaluation of sustainable development ability. Secondly, the energy analysis method is used to establish a reasonable comprehensive ecosystem and evaluate its impact on the sustainable development of environment and economy. Finally, the impact of resource consumption, wind speed detection, waste discharge, and utilization of renewable resources in a certain area is analyzed by simulation. Through the experimental results, on the one hand, it is proved that the data obtained by the combined algorithm are more accurate than the single algorithm; on the other hand, the combined algorithm can be further sublimated and widely used for other data detection. The combination algorithm proposed in this paper can effectively detect the required data and has high applicability.

1. Introduction

In recent years, due to the continuous development of information technology and the continuous expansion of the network field, a large number of offline software and online applications came into being, playing a corresponding role in various fields [1]. The background of these applications is mainly data driven, and users can also generate a large amount of data by using the application [2]. Diversified data can not only facilitate users to quickly find the information they want to know in an acceptable time and understand the world without leaving home but also help enterprises combine online and offline business to expand business scope. Online commerce [3] has become the mainstream. At the same time, the government can also work efficiently through municipal data information, solve problems in time, and carry out more convenient service projects [4]. The emergence and existence of data promote the growth and progress of various industries and public utilities. However, most of the time, people tend to pay too much attention to new data and conduct a lot of research on new data. However, a large number of previously generated data are generally stored in the database and can only be taken out as a reference when necessary. But we all know that the analysis of new things is often based on the past things, using the corresponding method to find the relationship between the old and the new, so as to get the development law of new things. Therefore, in the face of new data, how to extract and mine more useful information from massive data and generate more commercial value and social value has become a hot issue at this stage.

In view of the rapid growth of data, detection data has become an effective way to make full use of data. Data detection [5] means that the tester can judge and speculate the future results of the tested object with high precision by mastering the existing information, using certain scientific

knowledge, laws, and detection methods, so as to understand the development direction of things conveniently. The detection should not only consider the past characteristics and possible laws of the detected object but also consider various uncertain factors of the detected object at present or in the future. The test is similar to the budget before the start of a business activity. Before the start of the event, the organizer will plan and estimate the activity based on previous experience and preliminary preparation and make a financial forecast for the implementation of the activity, so as to prevent accidents. Similarly, detection is also based on historical data to establish a model and find out the law, through the detection model to outline the data development curve, so as to get the possible results in the future. Taking the power system as an example, power producers or power departments conduct short-term or long-term detection based on the electricity consumption in the past few weeks, months, or even years [6].

Intelligent search [7] is an important branch of artificial intelligence. The fundamental purpose of the intelligent search is to derive the required target state according to the initial state of the system, that is, the operation rules of each member in the system. Because of its great practical significance, it has attracted the praise of numerous famous scientists. Since artificial intelligence was formally put forward [8], intelligent search has made great progress over the years and has become an extensive interdisciplinary and frontier science. Generally speaking, the purpose of the intelligent search is to make computers think like people. After the advent of computers, human beings began to have tools to simulate human thinking. Computers play a role for human beings with their high speed and accuracy.

Because the data is more or less affected by external factors and there is noise in the data, the combined algorithm mode can be used for data processing to remove the noise in the original data and reduce the adverse effects. At the same time, the combined algorithm mode can absorb the advantages of the first simulation and discard its disadvantages [9], so that we can learn from each other to make up for the disadvantages. In order to better determine the proportion of several single methods in the combination method, the artificial intelligence optimization algorithm is used to dynamically adjust the corresponding weight of each method to fully improve the detection effect. Based on the above characteristics, this paper studies the combined detection model based on sustainable computing and artificial intelligence optimization, in order to make the detection results with high accuracy and small error and ensure the wide applicability of the detection method. In this paper, the data validation of the ecosystem in a certain place not only proves that the combined method is more effective than the single method and other similar combination methods but also proves that the method is widely applicable and can be applied to many other aspects. In addition, in order to show that the sustainable calculation and energy analysis method are helpful to improve the detection accuracy, this paper also compares the data errors detected by the combined method model and further proves the good detection effect of the proposed method.

2. Establishment of Combined Algorithm Model Based on Sustainable Computing and Artificial Intelligence

2.1. Overview of Sustainable Computing. The concept of sustainable computing [10] is characterized by the integration of economy, resources, environment, and society. The essence of sustainable development is to realize the unity of economic and ecological benefits. The economic benefits are mainly reflected in the profit level of production activities and the tax revenue created the remuneration paid to the workers, while the ecological benefits are mainly reflected in improving the ecological environment and reducing the consumption of natural resources directly or indirectly [11, 12]. In the face of the rapid development of human industrial production activities, a series of questions about the real value of resources, environment and industrial production activities, the impact of industrial production activities on resources and environment, and how to quantitatively analyze and systematically evaluate the sustainable product production process need to be answered.

2.2. Definition of Artificial Intelligence. The development of artificial intelligence [13] is based on hardware and software. Its development has experienced a long process of development. Long ago, people began to study the formation of their own thinking. Aristotle took the early steps of developing artificial intelligence as early as a year B.C., when he began to explain and annotate deductive reasoning, which he called syllogism. It can be regarded as the original knowledge expression standard.

Artificial intelligence is a frontier interdisciplinary subject in the world, but like many emerging disciplines, artificial intelligence does not have a unified definition [14]. Artificial intelligence is difficult to define precisely. Many human activities, such as solving problems, guessing, discussing, making plans, writing computer programs, and even driving cars and bicycles [15], require "intelligence." If the machine can complete this task, it can be considered that the machine has some kind of "artificial intelligence."

2.3. Types of Detection Models. Before the detection, once the appropriate method is selected, in order to complete the detection more accurately, it is necessary to establish a specific detection model. According to the first mock exam method, the number of models is single. Since most of the previous detection is based on the linear relationship between data, we use the known historical data to find the corresponding regular curve and calculate the next data according to the linear equation of the regular curve. However, the data in practical application are very complex. In addition to a small amount of data, there are a large number of data with a certain nonlinear relationship. In order to solve the problem of nonlinear detection effectively,

the first simulated test is generated step by step. Therefore, the first mock exam can be further divided into traditional methods based on theoretical statistics and artificial intelligence methods that can effectively solve the data diversity characteristics [16].

(1) The first mock exam of a single model is usually a single detection model [17]. According to the different characteristics of data samples and the further study of theoretical methods, the models can be roughly divided into the following two categories: on the basis of traditional data models, the future value can be detected directly based on mathematical models. This method has the characteristics of simple method and small sample data. It mainly includes the following methods: empirical detection method, trend extrapolation method, regression detection method, time series detection method, and grey detection method. The method of artificial intelligence was proposed by Dartmouth University society in 1956. It belongs to a kind of computer science, which is formed by the combination and penetration of various disciplines. Its goal is to research and develop intelligent entities. Artificial intelligence methods mainly include artificial neural network technology, swarm intelligence, and support vector machine [18].

(2) Combined detection model [19]: although the traditional detection methods and artificial intelligence methods can achieve better detection results in some fields, the detection accuracy cannot be further improved due to the single method. For example, the traditional detection method can effectively deal with the detection of linear data, and the artificial intelligence method can well deal with the detection of nonlinear data [20]. However, most of the data at this stage contain both linear and nonlinear parts. Only by combining the advantages of the two can we solve the problem better. At the same time, the first simulated test model can be applied to different fields more widely. The combination model can dynamically adjust the weight of each method according to different data, which has achieved good results in many fields. The main idea of the first mock exam is to create a new detection method based on different characteristics of data and using their respective advantages to dynamically combine different single models.

2.4. Test and Evaluation Standards. Because detection is an estimation of the possible trend, there must be a gap between the detection and the actual value, and this gap is inevitable. The quality of the model is determined by the error value to a great extent. In order to evaluate the detection model objectively and accurately, the following six evaluation indexes are generally used: absolute, relative, average, root mean square, and standard error.

2.5. Energy Analysis. Energy [21] is a new scientific concept put forward by famous American ecologists. It is defined as the amount of another energy contained in a flowing or stored energy, called the energy value of energy. Because all kinds of resources, products, or services come from solar energy directly or indirectly in the formation process, in practical application, the energy value of different types of energy is measured with solar energy as the benchmark and solar Joule as the unit [22].

Energy analysis theory [23] is the latest system analysis method in the development of system ecology and ecological economics. This method inherits the idea of whole life cycle system analysis. Based on solar energy value, different types of noncomparable energy in ecosystem or eco economic system are transformed into the same standard energy field for measurement and analysis. Energy analysis can deeply understand the structure and function characteristics of ecosystem by calculating various input energy values and constructing evaluation indexes and ecological economic benefits.

The energy analysis method makes different energy and materials get the same comparison standard [24]. It can objectively evaluate the actual contribution of various forms of noncomparable energy, such as economic input. After inspection and verification, it is determined that the revised content is consistent with the original intention of the author. System analysis method [25] is a new analysis method for developing traditional energy, but it is still imperfect, the application of the industrial system is still in the initial stage, the systematic energy index system needs to be improved, and the comprehensive evaluation index system of sustainable development is still lacking.

As shown in Table 1, we compare the above methods of system analysis. It is found that the energy analysis method is very suitable for the establishment of the combined algorithm detection system proposed in this paper. Energy analysis is based on energy analysis. It converts all kinds of energy, nonenergy material flow, and capital flow into the same standard energy for data processing and system analysis.

2.6. Establishment of Combined Algorithm Model. In this paper, the model of the combined algorithm based on sustainable computing and artificial intelligence is divided into three parts: the prior processing part, the independent detection part, and the weight adjustment part. These parts are adjusted as follows:

(1) Priority processing part before inspection: due to the influence of various uncertain factors on time series data, there will be missing or unavailable "dirty" data in the original data, resulting in relatively poor detection results and being unable to achieve the expected purpose. In order to eliminate the interference caused by noise data, the data is processed before the simulation experiment. Wavelet denoising [26] is used to analyze the original data. By setting the minimum value, the data whose noise is

Table 1: Simple comparison of various system methods.

	Net energy analysis	Exergy analysis	Analysis of accumulated effective energy	Energy analysis
Comparison content	Energy	Energy	Energy	Energy
Company	J	J	J	scj
Energy quality	No	Yes	Yes	Yes
Evaluating indicator	Energy production input ratio	Effective energy efficiency	Minimum recovery work and regeneration factor	Energy comprehensive index system

less than the value is eliminated, and the remaining data are reorganized accordingly to obtain the data with no noise or less noise.

(2) Separate detection part: because the data has been processed prior to inspection, the separate detection part is to redistribute the priority processed data. After wavelet denoising, the weight of each part is calculated by evaluating the error between the detected value and the actual value, and the weight is obtained by considering the detection accuracy of each part.

(3) In the weight adjustment module [27], the dynamic weight selection of a single method can make the whole detection model fully absorb the advantages and disadvantages of a single method in detection and further improve the detection accuracy. Secondly, the weight dynamic selection can be dynamically adjusted according to the different data processed, which is suitable for many fields. Particle swarm optimization algorithm is used to adjust the weight [28]. Particle swarm optimization algorithm has a certain storage capacity in the process of parameter adjustment. It can approach the local optimal and global optimal step by step. It can quickly find the optimal solution and allocate the weights of three independent methods in the proposed combined algorithm, so as to obtain the final detection results.

Because the ecological data [29] is inevitably affected by various factors and contains noise, if the original data is directly used for detection, the detection error will increase, which will directly affect the effectiveness of the detection model. Therefore, before detection, the noise of one-dimensional time series is decomposed by wavelet. Generally speaking, there is no perfect and effective method for the selection of decomposition level, which can only rely on experience. Assuming that the first mock exam is composed of these two single models, the process of obtaining the combined algorithm of sustainable computing and AI is as follows:

(1) Firstly, the combination algorithm model is used to predict the time series in the prediction interval.

(2) Secondly, by evaluating the error between the predicted value and the actual value, the corresponding weight of each model is calculated, and the detection accuracy of each model is considered.

(3) Finally, the weighted prediction is combined. Here, depending on the structure of the model, the inputs to the model may be the same or different. However, we found that they prefer to use the same input data by reading the existing literature. Generally speaking, the input data is a time series of past wind speeds; however, in some cases, other meteorological conditions such as wind direction, temperature, air pressure, and air humidity may improve the accuracy of the detection model.

2.7. Comparison of Different Combination Algorithms. The weighted combination algorithm and the combination algorithm with preprocessing are very suitable for long-term difficult detection. This kind of detection usually requires power system dispatching, optimal unit startup and shutdown, load tracking, and other operations [30]. The weighted composite algorithm can also be used for long-term projects such as the maintenance of wind turbines or conventional power plants. In addition, the combination algorithm is mainly used in ecological benefits and marketing, including parameter selection and data optimization methods, to improve the occasion of high-precision detection. However, the method combined with error processing only gives reasonable results in the case of systematic error, so it is not aimed at a certain field. Finally, it is worth mentioning that some combination algorithms do not necessarily improve the detection performance of a single model and even lead to worse results in some cases.

3. Application of Combined Algorithm Based on Sustainable Computing and Artificial Intelligence

3.1. Application of Combined Algorithm in Integrated Ecosystem. The combined algorithm uses the detection to get comprehensive ecosystem data and explores different ecosystem survival modes, such as ecological agriculture, forestry and fruit industry, aquaculture, construction land, and leisure and entertainment modes [31]. The combined algorithm model can effectively track the status of the ecosystem and give the evaluation system of ecological restoration benefits, which can maintain and supervise the stability of the environment and resources that need to be repaired. It will also make an effective feedback mechanism

to the economic standards and ecosystem service functions, to the restored places, and to contribute to the sustainable development of ecological restoration of the ecosystem [32].

The ecological restoration model is an effective way to reprocess the detected data and transform the negative effects into positive ones [33]. The economic benefits of the restored ecosystem have been greatly improved. Other restoration modes include the following:

(1) Ecological botanical garden restoration mode: clean up the cliffs where plants are difficult to grow. We always adhere to the concept of sustainable development, through the combined algorithm of land area detection, and the land can be planted for reasonable allocation, planting easy-to-grow flowers and plants.

(2) Sustainable ecological ranching model: the construction of pasture requires a large area of land support and sufficient water and electricity. Detect the wind speed in a certain area through the group and algorithm, and use renewable resources to build wind farms to solve the problem of large-scale land irrigation.

3.2. Application of Combination Algorithm

(1) The first major achievement in combinatorial algorithms is the development of chess programs that can solve complex problems, such as chess. Some techniques used in chess programs, such as looking forward to several steps and decomposing difficult problems into easier subproblems, have developed into search and problem simplification. Today's computer programs can play checkers, Gobang, and chess at various tournament levels. Some programs can even use the experience to improve their performance.

(2) Logical reasoning [34] is one of the most persistent branches of combinatorial algorithms. It is particularly important to try to focus only on relevant facts in large databases, pay attention to credible evidence, and correct them when new information appears. It is indeed an intellectual task to find a proof or reverse proof for a conjecture theorem in mathematics. This requires not only the ability to reason based on assumptions but also some intuitive skills.

(3) Natural language processing (NLP) [35] is one of the research fields in the combinatorial algorithm. It has written programs that can answer internal database questions in English. These programs can translate sentences from one language to another by reading text materials and building internal databases, execute instructions given in English, and acquire knowledge. Some programs can even translate the oral instructions of the microphone to a certain extent, rather than from the keyboard to the computer. At present, the main theme of language processing research is to pay attention to the importance of a large number of general knowledge, world knowledge, and expected function based on the theme and dialogue situation in sentence translation. The combinatorial algorithm has made great achievements in language translation and speech comprehension and has become a new concept of human natural language processing.

(4) Automatic programming [36] is developed to write computer programs for various purposes, such as input-output, high-level language description, and even English description algorithm [37]. Progress in this area is limited to a few recognized examples. The research on automatic programming can not only promote the development of semiautomatic software development systems but also develop artificial intelligence systems that learn by modifying their own numbers, that is, modifying their performance [38]. The task of automatically compiling a program to obtain a specified result is closely related to the task of proving that a given program will get the specified result. The latter is called program verification [39].

(5) One of the great achievements in combinatorial algorithms is the development of chess programs that can solve difficult problems. Some techniques used in chess programs, such as looking forward to several steps and decomposing difficult problems into easy subproblems, have developed into intelligent search techniques such as search and problem simplification. Today's computer programs can play checkers, Gobang, and chess at various tournament levels. Some programs can even use the experience to improve their performance. Among the many achievements made by computers, it is very important to extract their common features from their solutions and find out the general ideas to solve them.

3.3. Shortcomings of Combined Algorithm. Because the first simulation has different performance and fitting ability for nonlinear data under different data sets and detection ranges [39], the first mock exam method takes advantage of the different single models. The first mock exam method can improve the performance of the final detection and has many advantages over the single model. In the first simulation test, the most important thing is that the application field of the combination model is more extensive. The first mock exam is better than a single model. It is necessary to select the most suitable model through testing. When the first mock exam is difficult to determine, the combination model can overcome the shortcomings of the above single model. However, the definition and structure of the combination model are still controversial in the existing literature. However, the commonly accepted combination model structure in the existing literature is to assign a weight

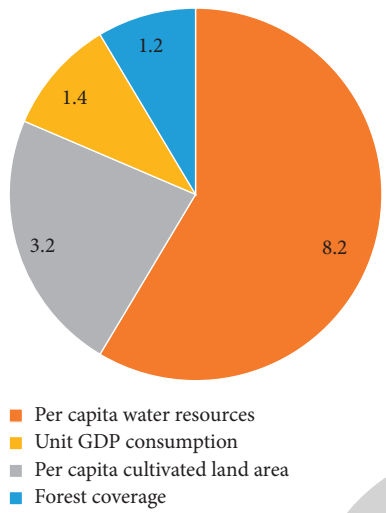

Figure 1: Detection of resource consumption error results.

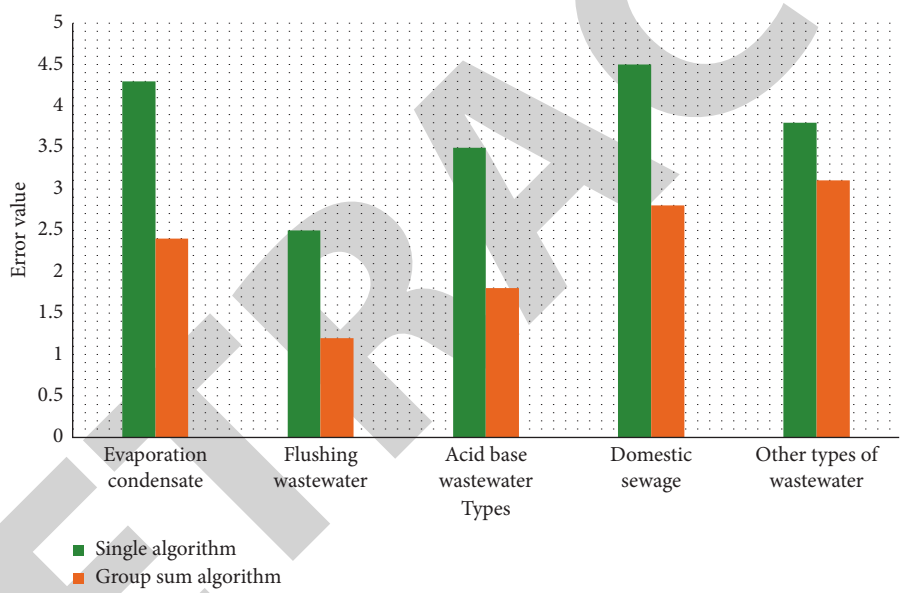

Figure 2: Test results of wastewater discharge.

coefficient to each model corresponding to its detection performance. In addition, other wind speed forecasting models with different methods are also called combined models.

4. Results and Discussion

4.1. Error Analysis of Combined Algorithm Detection Resource Consumption. As shown in Figure 1, we use the combined algorithm model to analyze the data of resource consumption, which shows that the error of per capita water resources is the largest, reaching 8.2%. Secondly, the average cultivated land area data analysis error is 3.2%. Then, the data analysis results of unit GDP consumption and forest coverage rate show that the error is relatively small. Through the error comparison, we can see that the most accurate way to detect resource consumption is the calculation of forest coverage rate, and the error is only 1.2%.

4.2. Comparison of Error Results of Different Algorithms for Wastewater Discharge Detection. As shown in Figure 2, in order to compare the effectiveness of the combined algorithm detection, we compare the results of the two algorithms to detect the wastewater discharge. According to the record, the single algorithm has obvious disadvantages compared with the combined algorithm. Mainly from the evaporation of condensate water, flushing wastewater, acid-base wastewater, domestic sewage, and other types of wastewater, the most significant error reduction is evaporation condensate, acid-base wastewater, and domestic sewage. With the help of the combined algorithm, the

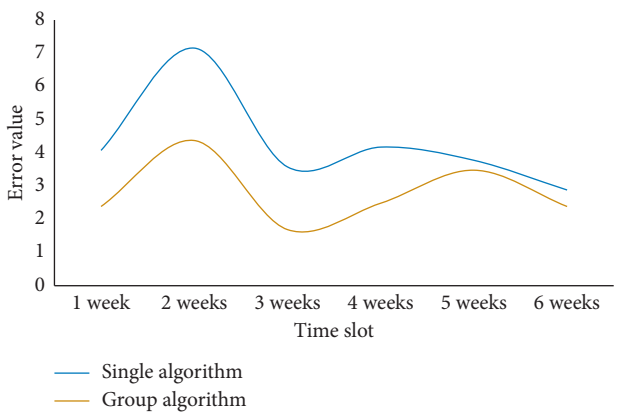

Figure 3: Error comparison of wind speed detection by different noise reduction algorithms.

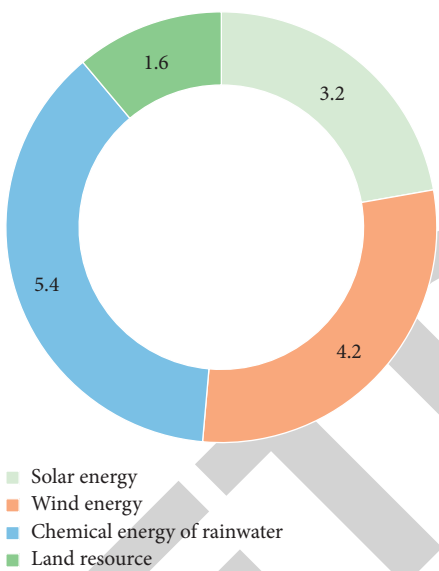

Figure 4: Error comparison of group sum algorithm for renewable resources utilization.

calculation of wastewater discharge is more accurate, which greatly reduces the shortcomings of single algorithm and reduces the risk of error.

4.3. Influence of Noise Reduction Degree of Different Algorithms on Wind Speed Detection Error. As shown in Figure 3, we carry out a series of tests on different levels of noise reduction data and study the detection accuracy of single algorithm and combined algorithm by detecting 0%, 25%, 50%, 75%, and 100% noise reduction modes. The results show that 75% noise reduction has a great improvement on the detection accuracy of the combined algorithm. Compared with the single algorithm, there is no significant change in the detection of different noise levels. We carry out wind speed detection for 6 weeks. The error of single algorithm is higher than that of combined algorithm in these six weeks, while the minimum error of combined algorithm is as low as 1.8% in the third week.

4.4. Error of Combined Algorithm for Renewable Resource Utilization Detection. A shown in Figure 4, we detect the renewable resources systematically. Compared with the previous detection system, the detection error of the combined algorithm is slightly improved. Particularly in the detection of land resources, the result error is only 1.1%. The second is the test results of the chemical energy of rainwater, with an error of 2.2%. The detection error of solar energy resources is large, which may be due to the inaccurate data measurement, resulting in more uncertain factors in the calculation of the combined algorithm, so the error is large. But in other aspects, the detection error rate has a very obvious downward trend.

5. Conclusion

Under the situation of rapid economic growth, severe environmental conditions, and relative scarcity of resources, it is an important strategic choice to realize the coordinated development of economy, society, and environment and develop circular economy. The whole world is making great efforts to realize the sustainable development strategy, and the whole country is exploring the renewable situation of economic value, ecological environment, and resources. Based on the above strategic objectives, this paper proposes a new combination algorithm based on sustainable computing and artificial intelligence. Firstly, the combined algorithm proposed in this paper is used to detect the resource consumption and the utilization of visible resources. It is found that the error of detecting forest coverage is only 1.2%. The detection of land resources is particularly significant, and the error is only 1.1%. It can be seen that the detection effect of the combined algorithm for large area resource reuse and consumption is particularly prominent. Secondly, the single algorithm and the combination algorithm are analyzed and compared; the main content is the impact of wastewater discharge detection and noise reduction degree on wind speed detection. The comparison shows that the error rate of the combined algorithm is lower than that of the single algorithm. It is found that the detection error of the combined algorithm with 75% noise reduction is the minimum, which is as low as 1.8%. Finally, it is found that the advantages of the combined algorithm are that it can detect accurate data, process and analyze the data more carefully, and play a low error data detection under 75% noise reduction environment, which is further on the road to sustainable development.

Data Availability

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

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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