Application of Computer Technology in Building Material Detection

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Abstract. The construction industry has a long history in China. Some advanced technology about architecture has been gradually excavated out. As an important part of the building, the quality of building materials should be paid attention to. In recent years, various safety problems caused by the quality of building materials are worth pondering [1]. On this basis, the task of building material detection will become more arduous. Experts believe that the application of computer technology can better assist the work of material detection. This paper briefly analyzes the advantages of computer technology in material testing. Finally, this paper puts forward the concrete application of computer technology in building materials.

Keywords: Computer, Architecture, Materials, Detection

1. Introduction

With the continuous improvement of China's economic system, our building system has also undergone great changes. As we all know, with the development of the times, the architectural style of buildings in China is also constantly updated. The application of various advanced technologies in the design of buildings has been discovered many times. People gradually forget the quality of building materials. With the extensive application of some low-quality materials, building quality problems and people's living safety problems have appeared. Many construction experts have begun to find the quality of building materials. Experts suggest that engineers should pay attention to the inspection of building materials. It has to be seen as a critical task.

Most of the work of traditional building material detection is done by human. Because the traditional construction industry is not very developed, the error of building materials is also very large. However, the effective implementation of the new precision standards in the construction industry has increased the work task of building materials detection [2]. Manual detection work has been unable to meet the needs of today's construction industry (see Figure 1). Therefore, some senior engineers suggest using advanced computer technology to complete the inspection of building materials. This paper briefly describes the composition of the material detection system based on computer technology. Computer related software design content is also summarized in this paper. Finally, this paper puts forward the corresponding advanced computer detection application.
2. Composition analysis of computer detection system based on building material detection theory

2.1. Construction and maintenance of original database
A lot of building materials testing work is completed by manual assistance. The parameters of the same kind of building materials are similar. We can store these parameters in the original database of the computer. The database can record many kinds of material names and related parameter standards. When the computer starts to run the material detection system, it can extract different original data according to different kinds of building materials.

2.2. Testing database based on new materials
The technical basis of this new database is the memory function of the computer. After the computer completes the detection of a new type of building materials, the detection database can immediately store the type name and parameter data of new materials. Compared with the original database, the update cycle of the new detection database is very short. Unfortunately, it cannot store the raw data content. Therefore, the original database and the detection database should help each other.

Figure 1. The tested building materials can ensure the quality of the building.

2.3. Processing function module of test data
The content of data processing function is rich. It should include data acquisition function, data calculation function and data judgment function. After the computer completes the data measurement, the system collects the data into the database. At the same time, the data parameters complete the corresponding mathematical model calculation. According to the difference of the experimental process, different experimental results are obtained. The sensitivity of the monitoring data processing function is related to the performance of the computer.

2.4. Automatic monitoring function module
The detection methods of different building materials are different. According to the theoretical research of material engineering, the performance of different building materials is different. They can withstand the difference of detection method is very big. According to the difference of material properties, automatic monitoring function module can replace manual automatic selection of appropriate detection method. The staff only need to place the materials on the platform of the detection system.

3. Computer software design requirements based on detection function support

3.1. Construction of suitable computer network system
The network system must have two servers. The first server is mainly responsible for the operation of network services [3]. The second server is mainly responsible for data backup function. The running
environment of computer testing software must be stable. Therefore, we set the system environment to win 7. The database system can use Ms6.5. At present, the data content security of this system is relatively high.

3.2. Composition of computer testing software
Generally speaking, the functional modules of computer software are called subsystems. It should include business management module, instrument management module, background operation module and data sharing module. Business management module mainly supports the operation of various detection functions. Instrument management refers to the computer self-examination system. Although the login IDs of the two same computer software are different, we can still use the data sharing function to share the experimental data.

3.3. Design principles of computer monitoring software
The design concept of function module can not be abandoned. It can make functional software more easily recognized and used by people. These modules should have several connected nodes. In addition, the software must ensure the simplicity and sensitivity of operation. It is necessary to ensure that the testing of materials is comprehensive and meticulous. On this basis, designers should do a good job of software maintenance forecast.

3.4. Setting of feedback area and comment area of software
In the internal application of detection software, staff should design independent feedback area and comment area. After people use the detection software, they can write their feelings in the comments area. Some innovative ways of testing materials can also be shared. When people find bugs in detection software, they can write these errors in the feedback area. Technicians modify software errors according to the problems in the feedback area.

4. The main application of computer technology in the detection process of building materials

4.1. Application of material sampling process
In order to ensure the standard of testing data of building materials, the sampling method used in the testing process is very important. Generally speaking, the method of sampling inspection in mathematical theory is commonly used. However, due to the tendency problem, the traditional manual sampling is not standard. It can lead to accidental material testing. Computer technology can use internal probability model to improve the task of sampling inspection. This will greatly reduce the frequency of accidents.

4.2. Application in the measurement process of materials
The accuracy of traditional manual measurement is very low. The process of measurement is also nonstandard. We can give an example. When testing the hardness of the material, the technician gently places the hardness tester on the surface of the material. However, accurate control of pressure cannot be accomplished. Small manipulators with computer content can control the pressure more precisely. This method can measure various parameters of materials more accurately (see Table 1).

| Building material | Test parameters | Test method        |
|-------------------|-----------------|--------------------|
| Cement            | Strength        | Coring method      |
| Pipe              | Rigidity        | Tensile test       |
| Steel bar         | Hardness        | Nondestructive testing |
| Ceramics          | Stability       | Heating test       |

4.3. Application in data processing
The process of data processing mainly depends on the computing power of the computer. The old
manual data processing is very troublesome [4]. People need to spend a lot of time to complete the experimental data calculation work. With the development of cloud computing technology, the high computing power has been integrated into the computer measurement software. Using the cloud computing data processing function of the software, people can get the experimental results directly.

4.4. Application of output process of test results
The contents of the report sheet of experimental results must be accurate. Because the memory of the human brain is short-lived, errors often occur in the report sheet of the results of artificial experiments. Using the powerful database memory function of computer, the value of data will not be wrong. The printer function connected by software can replace manual handwriting. This can ensure the smooth development of the detection work.

4.5. Application of history query of test report
After completing a lot of experiments, the detection system will store these experimental reports in the database. People can use the information query function of the computer to find the experimental data and reports at different times. Compared with the manual search process, the operation efficiency of the computer system is relatively high. In addition, staff can complete the same query according to the time and material type.

5. The advantages of using computer technology in material testing

5.1. It can avoid repeated self numbering
In the process of sampling survey, the number of manual may be repeated. Computer technology can complete the independent serial number. It guarantees the uniqueness of each number. This can avoid the confusion caused by duplicate numbers. On this basis, the efficiency of computer numbering function is very high. Compared with manual sampling, it is more convenient and rapid. High fault tolerance makes the detection system recognized by people.

5.2. Self inspection process of detection system
Many people think that the detection system may have problems that cannot be modified. Due to the system's program error, it may make the detected data error. In fact, the detection system has a function of error feedback. The system can detect internal program errors. Depending on the type of error, the computer will use appropriate improvements. Its advantage is that it can adjust program errors without manual help.

5.3. It improves the accuracy of the test data
The detection process of using artificial building materials is very complex. This process takes many steps. There may be many errors in the results of the detected data. Because of people's carelessness, the accuracy of the results is very low. The cloud computing function of the computer can replace the brain to complete the data calculation work. Moreover, it can simplify the steps of data measurement. It greatly improves the accuracy of monitoring data.

5.4. It can save staff time for data exchange
In the process of manual data exchange, the time of test data transmission is related to the distance between different laboratories [5]. If people send mail by express delivery, some documents may be lost on the way. The detection software of computer can use the data sharing network node to complete the data exchange. The operation time of this switch is only related to the network transmission speed. Therefore, it greatly saves the working time of staff.
6. The main practical role of computer technology in the detection process of building materials

6.1. It can improve the quality of buildings
Nowadays, due to the popularity of low-quality building materials, many buildings have quality problems. This problem is not only related to people's living standard, but also related to people's life safety. The high quality of materials can be guaranteed by using computer. It will directly improve the quality of the building. This way provides people with a more comfortable and safe living environment.

6.2. It can improve the economic benefits of the construction industry
The cost of a lot of low-quality building materials is very high. However, it is difficult to find the quality problems of materials by manual detection. This led to a lot of money being wasted. Using the computer material detection technology, people can more quickly determine the quality of materials. We have to make sure that every dollar spent is worth it. This greatly avoids the waste of funds in the construction industry.

6.3. Automation increases building efficiency
There is no doubt that artificial material testing is very complex. It's also very inefficient. Moreover, when people do not know the quality of materials, their construction process will be slow [6]. Automatic material testing ensures the quality of materials. Workers don't have to look again for construction joints of materials. This can reduce the construction time. It greatly increases the efficiency of the building.

7. Conclusion
In recent years, the development of China's construction industry is booming. However, the quality problems of building materials always appear. With advanced computer technology, we can avoid these problems. There is no doubt that it can guarantee the future progress of the construction industry.

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