

Design and Implementation of Chemical Automatic Drawing System Based on Computer Technology

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Abstract: *With the continuous development of computer technology, people pay more and more attention to the drawing process, and gradually improve it when designing and developing new software. This paper will study based on computer-aided graphics rendering system. Firstly, this paper introduces the concept and characteristics of chemical automatic drawing, then studies the straight-line algorithm and arc algorithm in drawing based on computer technology, designs and develops the framework of chemical automatic drawing system, and tests the performance of the system. Finally, the test results show that the system has strong response load, stable system performance, good stability and high sensitivity. These reasons make the automation technology in the chemical process operate effectively in the actual work, so as to improve the production efficiency and product quality of the enterprise.*

Keywords: *Computer Technology, Chemical Automation, Automatic Drawing, Drawing System*

1. Introduction

The rapid development of computer technology has brought us great convenience. In today's society, people have higher, more comprehensive and complex requirements for information management. While bringing convenience and work efficiency to people's life, they also put forward higher requirements for their drawing system [1-2]. In order to improve work efficiency, reduce labor cost and make the system more perfect, safe and reliable, it is necessary to use computer technology to realize automatic drawing function to complete this task [3-4].

Many scholars have done relevant research on computer technology. The research on automatic drawing system in foreign countries started relatively early. It began in the 1970s, and computer technology began to be applied to engineering design. In the late 1980s and at that time, the United States has formed a mature and perfect cam management system [5-6]. With the development of computer engineering technology, there have been various functional fields, a variety of software products, comprehensive information management information system platform architecture with relevant professional knowledge and skills, and advanced information technology products such as development tool system. It is also gradually used in manufacturing process automation abroad, and has made some achievements. China's automatic drawing technology started late. At present, there are many advanced practical computer-aided design software in China. These software mainly include: a graphical display function and real-time dynamic interactive operation interface developed based on CAD, programmable controller and other modules. The database management program is used to realize the automation, rapidity and flexibility of image file processing and display information. Various types of data formats can be used in the drawing process, Such as curve chart or column chart, etc. [7-8]. The above research has laid the foundation for this paper.

As an important pillar industry of China's national economy, chemical industry plays an irreplaceable and leading role in social economy, and its development prospect is broad. The automatic drawing system is one of the new technological processes produced by the combination of computer technology and automatic design. This paper studies, analyzes and compares the application fields of computer-aided graphics workstation, information management platform and human-computer interaction software.

2. Discussion on Chemical Automatic Drawing System Based on Computer Technology

2.1 Automatic Chemical Drawing

2.1.1 Concept

Chemical automatic drawing system is based on computer network and combines the theory and practice of information management technology, computer graphics and automation. Through computer technology, edit the information such as graphics, tables and text, and input the data into the database. The software can realize the operation functions of real-time data acquisition and processing in various stages and working links in the production process [9-10]. This software can provide users with a complete data storage and information processing platform. It can not only record, analyze and sort out the actual operation of the plant, but also intuitively display the changes and causes of various detailed parameters such as production equipment and working status through the graphical interface, so that users can timely grasp the current operation mode, production process flow, personnel allocation and other related problems of chemical enterprises, Facilitate decision-making and adjustment [11-12].

2.1.2 Features

(1) The automatic drawing system is realized by computer technology. It can edit and modify graphics, complete various complex operations on the computer, and combine it with other related software.

(2) It has openness and compatibility. Its compatibility enables it to automatically draw complete and clear information, which will be displayed after input, and can provide corresponding functional modules, program codes and other aspects according to different user needs. The content should meet the requirements of customers. The chemical automatic drawing system is a software integrating automation and informatization, which has very unique advantages high openness, because computer technology can realize information sharing in a large range.

(3) It has good readability and easy expandability. In the process of drawing, graphics, text and other information can be modified as needed, so that the operator can complete the work more easily. At the same time, it is also convenient for users to obtain the data and relevant information required for chemical production anytime and anywhere. In addition, it is also conducive to computer technology to provide users with higher efficiency and convenient query methods and retrieval tools. In addition, because the automatic drawing system can realize the characteristics of functional diversification, friendly interface and easy expansibility, it has good expansibility and easy expansibility in practical application. The design of the system has strong flexibility and adaptability.

(4) It has strong practicability and can realize various complex and powerful functions. After the combined application of automation and information technology, the amount of information can be greatly increased. For example, the network platform can be used to establish data transmission and process control between various links in the production process of petrochemical enterprises, and can also realize the operation monitoring of chemical equipment Function and fault detection and diagnosis function, so as to effectively ensure the accuracy of the automatic drawing system.

2.2 Computer Related Technology

The application of computer technology in chemical production process is mainly through data collection, analysis and processing, so as to transmit all kinds of information to users, and can also change the working mode according to different needs. Therefore, the use of computer technology can not only realize the functions of automatic control and automatic detection, but also improve the communication ability, cooperation consciousness and efficiency among employees within the enterprise, and promote the enhancement of the whole team cooperation and the improvement of the overall quality. In addition, it can also be effectively managed in the chemical production process, which is helpful to product quality, output and cost.

(1) Straight line algorithm

Linear algorithm is a point-to-point comparison algorithm widely used in character system. The principle is as follows: whenever the task execution service drives a route, it must compare it with the coordinate value on the given track, and check the relationship between the current position and the track position to determine the next feed trend speed. If the current position is lower than the specified title, the next will go to the beginning of the specified title, and vice versa. If the current position is

within the specified track, the next step is to exit the specified track, and vice versa. In this way, the next step is decided one step at a time, and a "point-to-point comparison" is carried out to make the line close to a specific path.

$$F_i \geq 0 + X \quad F_{i+1} = F_i - |Y_e| \quad X_{i+1} = X_i + 1 \quad (1)$$

(2) Arc algorithm

A regular polygon is very similar to an ellipse if the number of sides n is large enough and the center angle of each side is small enough. In this way, the initial problem of drawing a circle becomes the problem of drawing polygons and lines. As long as we can determine the size and zero angle of N and the position of polygon vertex coordinates, we can bypass the very strict quadrant problem and directly use the above simple line drawing calculation to solve the drawing problem. When approaching a circle with a regular polygon, we assume that each vertex of the polygon is outside the circle and the center of each edge is inside the circle, and assume that the absolute error of their deviation from the circle is ε , R is the radius of circle and regular polygon θ Angle between the number of sides N and the center of each side θ Relationship between:

$$n = 2\pi R \theta \quad (2)$$

as long as $\varepsilon < 0.5$, the difference between edge line and arc line can be ignored.

2.3 Significance of Chemical Automatic Drawing

Chemical automatic drawing system is an important field of computer technology and automatic design. It plays a more and more important role in modern society. With the rapid development of science, technology and economy, computer science is becoming more and more mature and perfect. Computer aided process is becoming more and more complex, intelligent and integrated, which makes it more and more widely used in production. Chemical automatic drawing system is based on the design and implementation of computer technology. It has the following significance: (1) the information needed in the process of automatic production management can be transmitted to operators in real time and accurately. It plays a very important role in the whole chemical industry. Therefore, for enterprises, information construction is particularly urgent. (2) The information is transmitted to users through network connection, and at the same time, it can provide customers with more fast, efficient and safe services, and computer technology can automatically analyze and process data.

With the development of computer technology and automation software, many data processing knowledge is involved in chemical process. Drawing is to use graphics to express the production process, equipment operation and product use. At the same time, it can also provide a more accurate decision-making basis for enterprises. In addition, it can also help staff make a comprehensive analysis of the whole chemical industry and make corresponding countermeasures. The automatic drawing system has changed the previous methods of manual drawing and manual recording to a great extent.

3.1 Framework of Chemical Automatic Drawing System

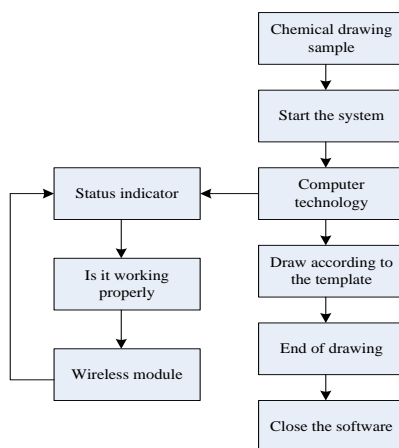


Figure 1: Chemical automatic drawing system framework

The framework of chemical automatic drawing system is shown in Figure 1. Users can operate each module on this platform. Click the corresponding function button to complete the interface display. Auxiliary design functions such as graphic data management and parameter setting mainly include the addition and editing of graphics, text and engineering effect drawings, parameter setting and modification through relevant software, and finally achieve the basic purpose and requirements of automatic drawing system. In the database management system, the function module can realize data sharing. Through the use of the software, it can collect and process a large amount of information, generate graphic files, etc. at the same time, it can upload text, pictures and related data to the server, which is convenient for users to query and modify the content of data. In addition, corresponding forms can be set on the web page according to the needs for visitors to view, so that the system administrator can make appropriate adjustments after understanding its specific conditions.

3.2 System Performance Test

3.2.1 Experimental platform

In the research and development process of chemical automatic drawing system, in order to ensure that the designed graphics can meet the needs of users, it is necessary to simulate them to a certain extent, so as to facilitate the later system upgrade. The main function of the platform is divided into two parts: the first is the client, and the second part is the data acquisition center. Through this platform, information collection, analysis and other related operations can be realized, and some parameter settings, data storage and other corresponding auxiliary functions can be provided to test various technical problems and related requirements involved in the development process, so as to make the whole design process more efficient and convenient.

3.2.2 Experimental significance

This design is mainly to test the performance of chemical automatic drawing system. In the process of chemical engineering drawing, the drawing environment and operators may affect the product quality, so it is necessary to verify whether it is qualified through testing. After the simulation test on this experimental platform, the results are obtained and the data and conclusions are analyzed. The simulation equipment parameter setting, control program writing and function realization can be completed through the software.

3.2.3 Experimental steps

After completing the drawing work, the performance of the system needs to be tested to verify whether the system meets the functions specified in the requirements analysis. (1) Manual operation: after entering relevant data, the corresponding parameter value and corresponding time will be automatically generated. (2) Software operation: set relevant parameters and program status information according to the user's requirements. In case of any abnormal phenomenon, it can directly send out alarm prompt or stop operation and return to normal working state.

4. Discussion

4.1 System Performance Test and Analysis

Table 1 shows the performance test data of chemical automatic painting system.

Table 1: Performance test data

Test times	Load test	Pressure test	Data volume test	Fatigue strength test
1	92%	94%	92%	89%
2	95%	90%	94%	84%
3	94%	95%	93%	85%
4	91%	92%	90%	83%
5	90%	94%	91%	90%

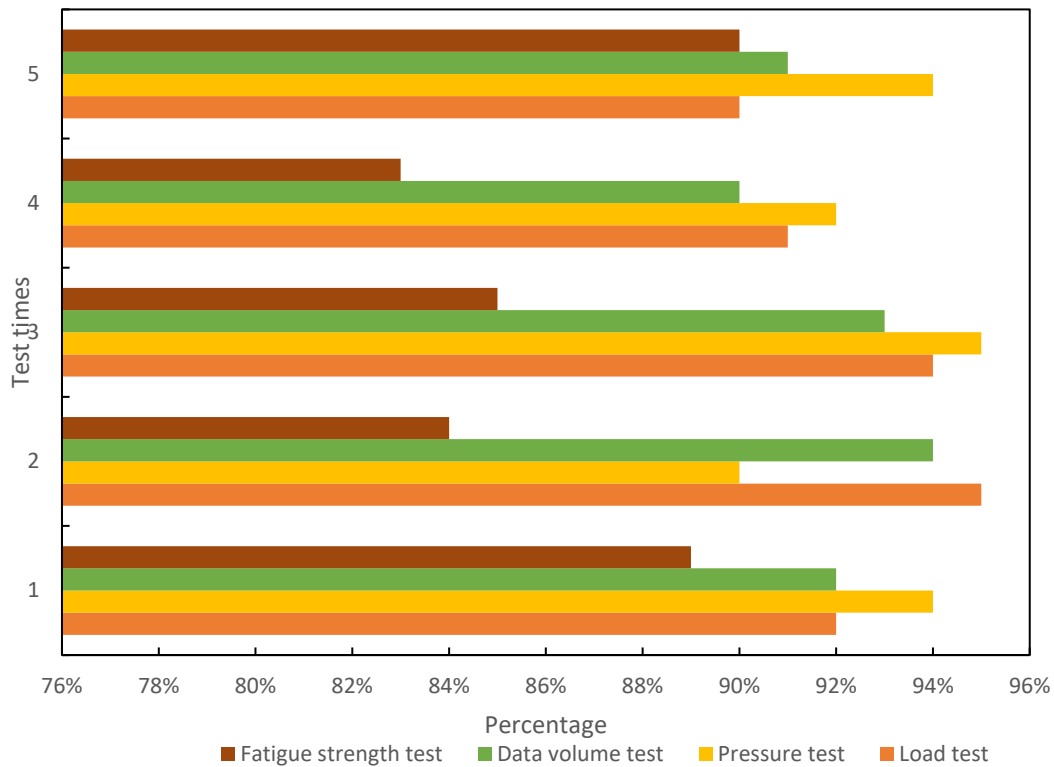


Figure 2: Performance test comparison

The chemical automatic drawing system based on computer technology mainly realizes the comprehensive processing of graphics, tables, words and other information through computer software. A variety of data acquisition methods are used in the system. The application of computer technology in chemical production can effectively improve the production efficiency, improve product quality and reduce labor cost. As can be seen from Figure 2, the system has strong response load, stable system performance, good stability and high sensitivity, which makes the automatic drawing function stable. These reasons make the automation technology in the chemical process operate effectively in the actual work, so as to improve the production efficiency and product quality of the enterprise.

5. Conclusion

Chemical industry is an important part of China's national economy, which plays a very key role in economic development. With the rapid development of computer technology and information technology, the traditional drawing method can not meet the needs of users to process information accurately and quickly. Therefore, using advanced, scientific and automatic design and development software to realize the construction of enterprise automatic graphics system based on computer technology has become an inevitable trend.

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