Research on the Application of Power Electronics Technology Based on Computer Simulation Software Technology

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Abstract. With the development and improvement of computers, computer simulation software technology has become more and more widely used in all walks of life, especially in the electronics and power industries. This article mainly focuses on the application research of computer simulation software technology in electronic power technology.

Keywords: Computer, Simulation Software, Power Electronics Technology, Application

1. Introduction

With the development of computer technology, electronic power technology is more and more widely used in industry, and with the development of the times, the country vigorously develops the use of new energy and distributed power generation, so the role of power electronics technology is becoming more and more obvious.

2. Computer

Since John von Neumann invented the computer, it has become one of our most advanced scientific and technological inventions. It has had a very important impact on human work and life, and this has led to global technological progress. An indispensable tool in social information, and it is also constantly developing, I believe it will get better and better in the future [1].

2.1. The characteristics of the computer

Computers can perform numerical calculations, logical calculations and information storage functions. It is an intelligent electronic device that can be performed in accordance with the program, which provides a lot of help for our lives. The reason why the computer can be effectively used by us is inseparable from its effective characteristics. It has the advantages of fast calculation speed, high
calculation accuracy, strong logic judgment ability and automatic control ability. The current computer system can reach trillions of times per second when calculating, and it can effectively solve more complex scientific computing problems. It used to take up to several months for complex computing problems, sometimes several month can't be completely solved. Now, a computer can solve this problem well, it only takes a few minutes to solve it well, and it will effectively improve the future development of mankind [2].

2.2. The use of computers

The use of computers has been widely reflected in people's lives, such as routers, laptops, smart phones, etc. A router is a special network computer, which effectively provides convenience for our lives.

3. Power electronics technology

The rapid development of electronic technology makes it often used in life, and the constant exploration of electronic technology has greatly improved our lives. Next, I will conduct a certain research on power technology.

3.1. The development road of power electronics

What we do now need electricity to complete, if there is no electricity, then our work can not be completed effectively. At night, the world will become dark, which is not conducive to the improvement of living standards, so we must cherish the current electricity. Power electronics technology has become an indispensable part of modern electrical engineering and automation, and it is necessary to train professional talents for its direction to improve the effective development of power electronics technology. It is generally believed that power electronic technology was developed in the first Thyristor developed by General Electric in the United States. Since then, the appearance of gate-off Thyristors, power bipolar transistors, and power field effect transistors has promoted the development of power electronic technology [3]. Comprehensive development, until now the rapid development of power electronics technology has provided a lot of development space for power electronics.

3.2. The role of power electronics

We often use electricity in our lives. Through power electronics, one form of industrial electrical energy can be effectively converted into another form of industrial electrical energy, which optimizes the use of electrical energy and makes electrical energy effective, reasonable and economical. The high-frequency processing of power electronic technology will enable electromechanical equipment to break through the tradition and develop in the direction of high frequency, which can improve work efficiency. The volume of related electromechanical equipment can also be reduced by dozens of times to achieve the rapid operation of power electronic technology.

4. Computer simulation software

With the progress of science and technology, especially the development of information technology and computer technology, computer simulation technology is constantly updated. The effective use of
computers also provides people with better ideas, and the invention of computer simulation software is even more improved. Improve the quality of life and promote the effective operation of life [4].

4.1. Definition of simulation technology

With the development of modern technology, simulation technology has become the analysis and synthesis of various systems, and limited research on large systems is possible. The so-called simulation is the vividness of some system properties, so as to achieve the purpose of effective processing. Simulation also needs to effectively solve related problems. It is necessary to deal with related problems of the system as well as related problems of the demander.

4.2. Traditional methods of simulation software

Traditional simulation software is an iterative process, abstracting a model, and then inputting the experiment, the experimenter tells the experimental results, and constantly changes the experimental model according to the judgment, until it thinks that this is the case. The model can serve the purpose of simulation of the objective system by the tester. This kind of simulation software is often used in simulators, etc., which effectively improves our quality of life [5].

5. Simulation software application

Simulation software is often used by people. Its rapid development has provided greater convenience to human life, and its efficiency has been continuously improved with people's development. Next, I will make a certain analysis of these applications.

5.1. Saber simulation software application

Saber simulation software can be used for power electronics, control and other different types of mixed system simulation, which can deal with a series of problems, such as circuit program control, simulation system and detailed design verification. For example: as shown in Figure 1.

Saber2007, L6561 data manual circuit, End Time=20m, TimeStep=1u, it can be seen from the graph that the input voltage and current tracking waveform in a cycle forms a certain model. Saber simulation supports top-down system design and bottom-up specific design verification. At the same time, it provides a powerful mixed-signal simulator that can simulate an actual system. The actual circuit needs program control. In Saber, we can use its special language (MAST) creates a model to control the actual system, which is very convenient to use [6].
Figure 1. Data circuit

5.2. **PLECS simulation software**

PLECS provides great convenience for its development, and it often uses its functions to solve related problems in schools. Every time you do a problem, you will do the relevant PLECS simulation homework.

5.3. **Simulator**

In some fields, there will be hydraulic presses, pneumatic presses, etc. as the main simulation equipment, later, the gradual development makes the simulation machine continue to be used in it. Now dedicated and general-purpose simulators with digital computers as the host are widely used. With the continuous development of technology, higher-level digital simulation simulators and intelligent simulators have emerged on the basis of integrating the advantages of integrated digital simulation and analog simulation. This is an important step for people's simulation [7].

6. **Application of computer simulation software in power electronics technology**

There are four main applications of computer simulation software in power electronics technology (as shown in Figure 2).

![Figure 2. Application of computer simulation software in power electronics technology](image-url)

1) Definition of simulation software. Simulation refers to a high degree of simulation of system properties. The use of simulation software can not only deal with various problems related to the system, but also deal with problems according to the requirements of the demander.

2) Traditional methods of simulation software. Traditional simulation software inputs experiments in abstract models to obtain test results, and then continuously improve the experimental models according to the judgments, until the tester believes that this model has achieved the purpose of system
simulation. The simulation software is mostly used in the early simulation machine, which has great help to improve people's quality of life.

(3) Features of computer simulation software.

1. The software upgrade is relatively simple. The computer simulation software can be upgraded quickly, and the upgrade difficulty is relatively low. The rapid development of new energy has promoted the development of computer simulation software, and increased the number of models to a certain extent. Moreover, the needs of users are also increasing, so the upgrade demand of computer simulation software is inevitable [8].

2. The graphical interface is easy to operate. The computer simulation software can be operated with a mouse, and the operation process is relatively simple. Computer simulation software and power electronic technology are very closely integrated, and the requirements for operating users are not very high. As long as the user has basic computer operating skills and power electronic theory, he can operate the graphical interface of computer simulation software.

3. Reduce the loss of equipment. Before circuit design, components are often measured and tested. The application of computer simulation software can simplify the process of component measurement, effectively shorten the test time, and minimize the loss of components. It should be noted that the actual model should be simulated as highly as possible in the computer simulation software.

(4) Application of computer simulation software in power electronics technology.

1. The application method of computer simulation software in power electronics simulation. The consistency of the parameters in the test is directly related to whether there is an error in the test data and the range of the error. If a simple tool measurement method is used, not only the accuracy is not high, but the number of times is also limited, and only a small amount of data can be measured. Using computer simulation software can observe the parameters in more detail and reduce the data measurement error. Moreover, it is not necessary to frequently replace components in the test after using the computer simulation software, and it is possible to accurately observe multiple curves in a relatively short period of time and find the various changes in the circuit [9].

2. The application of computer simulation software in the schematic diagram of power electronics technology. Applying computer simulation software to the schematic diagram of power electronics technology can effectively improve people's work efficiency, reduce people's work intensity, improve the scientific nature of analysis and design, and control the errors in the schematic diagram of power electronics technology within a reasonable range. In addition, the application of computer simulation software can also reduce unnecessary loss of components and save costs. The simulation design of the circuit mainly includes three parts, one is the extraction of the circuit, the second is the transfer module device, and the third is the construction of the system model [10]. The degree of simulation parameter change is related to the actual algorithm. The voltage is divided into two complex situations, positive load and negative load, which can be fully displayed through the waveform diagram.

7. Conclusion
In short, the application of computer simulation software has brought huge opportunities to the development of electronic power technology. Its application can play an important role in promoting the optimal allocation of resources. It allows electric energy to contribute more to the development of human society.

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