



# Realization of Computer Music Teaching System

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**Abstract.** Computer music, also known as computer music. A unique form of music since the 1980s, it is the product of the combination of modern electronic technology, computers, and some electronic audio processing equipment with music. The emergence of computer music has brought a fresh stream to the field of music and brought a new way of thinking about music to many musicians. Make more musicians bold and innovative, and change the original way of thinking about music in the past. Computer music makes us feel the power of technology.

**Keywords:** Multimedia technology · higher teachers · music education · multi-voice · application · research

## 1 Introduction

Computer Music, also known as: Computer Music, refers to the product of the full integration of modern computer multimedia technology and music education, music creation, production, and music dissemination. The People's Music Publishing House's "Oxford Concise Music Dictionary" defines computer music as follows: Up to now, composers only use computers when composing, designing and producing electronic sounds. Computers are also used to analyze works, study the style of works, and invent various notation systems. Leiaeren Hiller in the United States was a very early adopter of computers. He used the Ilyac computer to "create" by feeding in a program compiled according to Fuchs's 16th-century modal counterpoint rules and 20th-century serialism techniques. A piece of music "Illiac Suite for String Quartet" (1957). Insciber has launched a professional subtitle production software for fixed, scrolling or wriggling subtitles: CG Supreme, with lowercase letters, rotating titles, soft shadow True-Type font support and other functions, can be sorted and managed, can be operated on the network, can be For post-production and video editing. Sparks includes products from many companies, all of which are special effects production toolkits developed by Inferno/Flame/Flint/Fire/Smoke systems. 5DMonsters developed by British 5D company has about 120 special effects such as fireball, flame, fireworks, starlight, focus change, oil painting, pencil drawing, light tail, water wave, water bubble, deformation, kaleidoscope, neon light, lens light, particle, snow, rain, cloud, rainbow, watercolor painting, etc. The Sapphire image processing and compositing software developed by Genetic Arts in the United States has about 150 effects, such as: lens flare, flash and glare halo, overlay, erase, automatic painting, motion blur, edge light, deformation and jitter, etc..

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PrimatteS-100 developed by American Photron Company, TinderTools developed by British foundry Company, FunText developed by Canadian Hybrid Company, etc. The educational data statistical analysis platform is mainly to fully realize the automation of data business processing for a city's education bureau and facilitate business operations. It is a platform developed to quickly complete business operations between business departments. It is divided into two subsystems: open platform and background management [10]. The open platform is mainly to display the relevant information of a city's school (institution) on the front end of the educational GIS map, and realize the electronic map navigation and search. Inquiry location; background management mainly includes yearbook management, education GIS map back-end school information management, student migration, Modules such as data analysis, data forecasting and user management [11].

## 2 The Current Situation of Curriculum Setting of Computer Music Subject

2000, many schools have purchased more and more advanced music teaching equipment due to the promotion of the concept of digital music education and the increasing investment of schools in music education [1]. Most colleges and universities have established computer music production teaching laboratories and complete teaching systems. Some colleges have also established recording studios and music studios. China established a batch of computer music production teaching systems around 2002. Computers and related hardware have been eliminated and cannot meet the requirements of today's computer music production. With the help of a survey of nearly 50 relevant colleges and universities, the survey results are as follows.

It can be seen from Table 1 that the professional music colleges and art colleges have the highest proportion of computer music courses. Because the number of teachers' colleges is the largest, there are still some schools that do not currently offer such courses. In order to expand the scope of computer music courses and popularize music education to more people, this study designs and develops computer music systems [2].

**Table 1.** Course offerings

University Type	Music Academy	Art academy	Miscellaneous	Normal university
Absolute quantity	8	4	3	19
Number of schools	9	5	6	30
Percentage	89%	80%	50%	63%

### 3 Computer Music System

Computer music system has become a very common computer application direction in many developed countries. There are various types of computer music system atmospheres, including computer music systems that record audio, and computer music systems that focus on creating music or teaching music. This research design and development is a computer music system focused on teaching [6].

The computer music teaching system has the powerful data processing ability and multimedia ability of the computer. At the heart of a computer music system is one or more servers. Due to the characteristics of music learning, the computer music teaching system must meet the following three requirements:

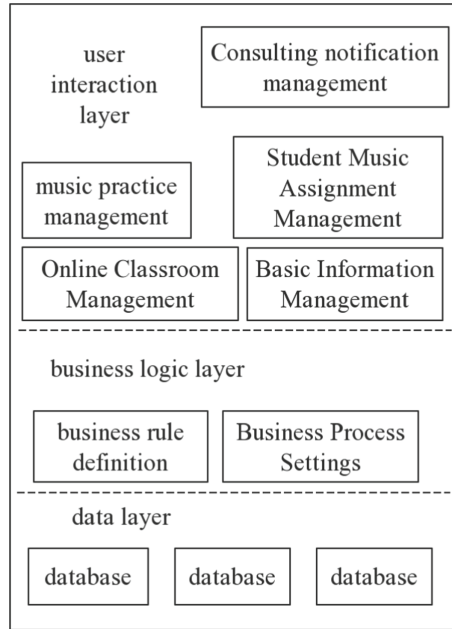
- (1) The system must have a highly centralized management system.
- (2) The system has workstations, and each workstation can independently and smoothly operate multimedia such as audio and video.
- (3) The process of system operation must be smooth and efficient, with low latency.
- (4) The system must have a real-time backup function.
- (5) Each module of the system needs to be relatively independent, and maintenance is relatively simple.

Before the system design and development, the system requirements should be collected and sorted out in detail. The size of the system is the key here. System design needs to balance cost and effectiveness. The larger the system scale, the higher the efficiency of system operation, but the corresponding increase in system development cost. If the system scale is small, the efficiency of system operation is lower, but the system development cost is correspondingly lower [3].

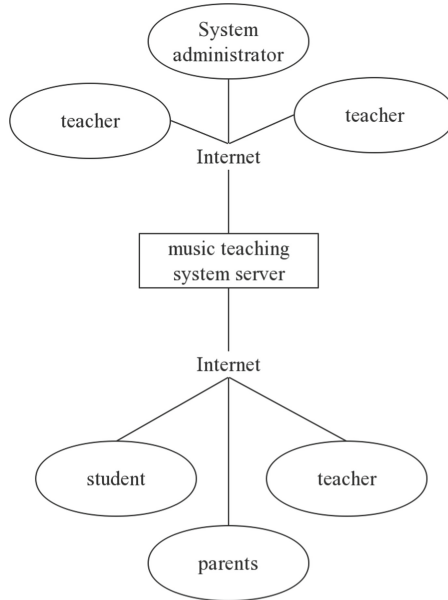
### 4 Design Scheme of Computer Music Teaching System

In the design process of the computer music teaching system, if only the Windows operating system is used, the built platform will be overloaded and the system will be unstable. Under this premise, if the system runs a lot of data, there will be many problems. In order to improve the stability and efficiency of the system operation, the system adopts the Linux system. The Linux system is easy to operate and easy to operate, and is very suitable for music teaching. At the same time, the system also uses MySQL to provide data resources to the system. MySQL has the characteristics of strong openness and can support a variety of system operations [7].

The computer music teaching system is an auxiliary teaching strategy using the Internet. In order to facilitate the maintenance and update of the system, the modular structure of the system is separated [5]. After building the overall framework of the system, the focus of system operation is placed on the server, and the client only needs to install a suitable browser. The client uses the web to realize the information sharing of the database. Since the music teaching system needs a lot of multimedia resources, this method of separating system modules can reduce the pressure of system operation, simplify the system, and facilitate the development and maintenance of the system. This



**Fig. 1.** System structure diagram



**Fig. 2.** System operating structure

system configuration requires less system hardware [4]. Teachers can operate in different databases of the system, and when downloading resources, they can quickly import and export multimedia resources [12] (Figs. 1 and 2).

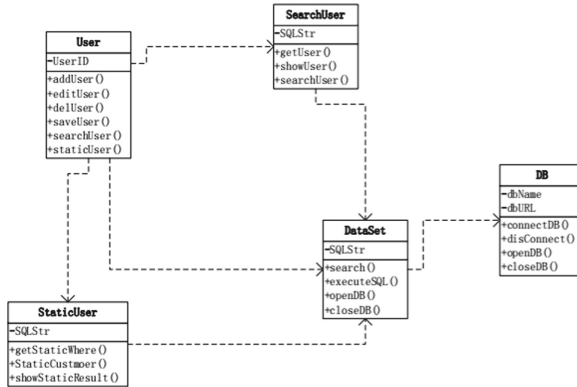


Fig. 3. User information management

### 5 System Workstation Deployment

To deploy the system workstation, first install a complete system on the hard disk of the teacher’s workstation. After processing, the directory is shielded, and some important files are modified and packaged to improve the interaction function of the entire workstation. The specific algorithm is designed as follows (Fig. 3):

```

apt-get install nfs-client #Install nfs client
nano /etc. /network /interfaces #Because the ip has been allocated when the machine is
turned on, change the ip allocation to manual, the example is as follows:
# The loopback network interface
auto lo
iface lo inet loopback
# The primary network interface
auto eth0
iface eth0 inet manual
#Edit the fstab file, comment out everything except proc, udev will do this automatically
#Edit the file about the network interface record in the rules of udev, remove the network
interface that has been defined
apt-get install initramfs-tools #Install initramfs-tools
#Edit initramfs. conf change BOOT = local to BOOT = nfs
mkdir/netfs #mount nfs
mount -t nfs 192.168.1.88: /home /cache /net-boot /netfs
#192.168.1.88 is the IP address of our hypothetical server
cd /netfs/; mkdir root tftpboot #Create two directories
mkinitramfs-o /netfs/tftpboot /initrd.nfs #Create an initrd.img file that supports nfs
startup
    
```



**Fig. 4.** Command 8

## 6 Recording and Editing of Digital Audio

Command 8 has the characteristics of low price and small size, and is well received by everyone. Command 8 is a must-have console for Pro Tools studios (picture 1), many people use it, especially its 8 good-feel faders can experience the feeling of mixing [8] (Fig. 4).

Home mode and Console mode:

Command 8 has three view modes. Home mode is the default. When you open a Pro Tools session, Command 8 will enter the Home mode by itself. The name of the track will be displayed on the bottom line of the screen, and all 8 knobs will be displayed. Set to pan.

## 7 System Workstation Deployment

In order to make the system more suitable for practical teaching and improve the efficiency of the system and the user experience, the system needs high-performance data processing efficiency and is suitable for mobile clients. To deploy the system workstation, first install a complete information system suitable for the client hardware platform on the teacher's hard disk. After that, it is necessary to perform basic processing on the system, such as shielding or modifying some directories, and then complete packaging and packaging of the directories, and copy them to the server side. The directories will be stored in the virtual root directory required by the client for users. Use. In the workstation deployment, the last step is to improve the interaction settings of the entire system from the perspective of the whole. On the premise that the teacher's workstation and the student's workstation are the same, the deployment of the workstation can start from the teacher, which can improve the efficiency of the deployment of the workstation.

Because there are many multimedia tasks in the music teaching system, such as various audio, MIDI data recording, virtual synthesizer live performance and so on. In

the process of using the system, the user requires the system to respond quickly to the user's operation. In order to improve the efficiency of system operation, the professional music software integrator developed by Ubuntu for computer music is used in this system. Users can freely add music software according to their own needs. The specific setting steps are as follows:

```
# The loopback network interface auto lo iface lo inet loopback # The primary network
interface auto eth0 iface eth0 inet manual #Edit the fstab file and comment everything
except proc
off, udev will do this automatically
#Edit udev's rules about network interface records
file, remove the defined network interface
apt-get install initramfs-tools #Install initramfs-tools #Edit initramfs. conf change BOOT
= local to
BOOT=nfs mkdir/netfs #mount nfs mount-t nfs 192. 168. 1. 88: /home/cache/net-
boot/netfs #192. 168. 1. 88 is our hypothetical server
's IP address
cd /netfs/; mkdir root tftpboot #Create two directories
mkinitramfs -o /netfs/tftpboot /initrd. Nfs #create
Initrd that supports nfs startup. Img file
```

## 8 Conclusion

With the help of composition technology theory course, students can experience the joy of music. In recent years, domestic music has also promoted students' music learning in an effective way, but there are still many deficiencies. These deficiencies still need to be solved step by step. We need to have high technical precision in notation skills, to fully grasp the complexity of various musical instruments, and to understand the characteristics of sounds. I believe that with our unremitting efforts, we will surely achieve better results.

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