



## THE DIGITAL MEDIA ART AND DESIGN SYSTEM UNDER THE INTEGRATION OF COMPUTER BIG DATA CHATGPT TECHNOLOGY

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**Abstract.** Traditional digital media art and design systems take a long time to run and cannot handle a large number of objects simultaneously. Therefore, the author proposes a digital media art and design method based on ChatGPT technology. ChatGPT technology is an important part of networking. Prepare to provide conference support for various applications such as customer service, personal assistant, robotic interview, and so on. ChatGPT can not only answer the question that is set, but also solve the question openly. The comprehensiveness and intelligence of ChatGPT have attracted widespread attention since its launch. The hardware system adopts dual core TMS320C6657 and DDR3The1333 series processors as the core circuit, together with high speed external storage, to expand the image transmission line of multi-data; System software uses module architecture to design image modules, video modules, and voice modules, all of which are integrated into the core of the system as modules. In this experiment, 10 images were transferred and the running time was tested. Experimental results showed that, the traditional digital media art and design system had three errors, which took more time to run.

**Key words:** Computer big data, ChatGPT technology, Digital media, Art and Design System

**1. Introduction.** The emergence of ChatGPT technology has brought significant changes to the development of intelligence. With the rapid development of technology, education is facing unprecedented challenges, and there is an urgent need for profound reform. Teachers should carefully study the effects and challenges that intelligence brings to education and teaching, and find solutions to them. With the rapid development and development of artificial intelligence technology, its application has become more extensive, and its performance in various aspects exceeds human potential [1]. ChatGPT technology, as the latest product of artificial intelligence, can quickly respond to users' input needs in chat boxes. Within a few seconds, a unique and clear thinking article that combines a large amount of information will be displayed to users. If you are not satisfied with it, users can continue to add requirements in the chat box. ChatGPT will make every effort to modify, improve, and update it, and the waiting time will not exceed one minute. In the future, ChatGPT may replace many traditional jobs. What talents should educators cultivate to meet this challenge? Therefore, the direction of talent cultivation is the primary issue that education needs to clarify to ensure that they have sufficient competitiveness and potential for future development [2,3]. ChatGPT technology enables learners to easily access various course resources, which brings the disadvantage that learners need to learn what artificial intelligence is not easy to achieve in order to gain an advantage in future competition. So, in order to meet future challenges, what course content do learners need to master to help them adapt to the development of artificial intelligence? How should courses be arranged in the future to meet the growing teaching needs? As mentioned earlier, ChatGPT technology can provide intelligent and complete solutions, effectively providing learning guidance for learners, which to some extent weakens the role of traditional teachers. How educators seize the opportunity, utilize ChatGPT technology and combine it with other artificial intelligence technologies to improve teaching methods, improve teaching experience and quality, is also a key issue that teachers are currently facing that urgently needs to be solved [4].

In order to meet people's aesthetic demands for the indoor and outdoor space environment of buildings, digital media is integrated into architectural design, and communication technology is used to meet the personal needs of different audiences. Digital Information System is a kind of information transmission system based on digital technique. It has good interaction and can enhance the real-time performance of drawing and designing.

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For this reason, we put forward an artistic design system of digital media based on ChatGPT. The focus of traditional digital media art and the design quality is not good. To solve this problem, the author used a pre-processing method to reconstruct 3D images, using the TMS320C6657 processor as the core of the system to handle related algorithm operations. Due to differences in DSP related circuits, some improvements have been made in the core processor, memory, and bus interface. In terms of software design, in order to repair the visual effects of art design, the development of a digital media art design system is implemented on the MapInfo development platform.

## 2. Methods.

**2.1. ChatGPT: Emerging New Artificial Intelligence Technology.** In recent years, chat robot technology has developed rapidly, and many enterprises and organizations have adopted them to provide more convenient and efficient customer service. However, although traditional chat robot technology has made some progress, there are still some challenges that need to be overcome, such as uncoordinated dialogue content and inaccurate answers [5]. In order to effectively address the current challenges and challenges, researchers have developed a new chat robot technology called ChatGPT. ChatGPT is a discussion of the intelligent language design system developed by OpenAI, one of the world's leading research fields in intelligence. The architecture of ChatGPT is based on the Transformer network, which is an integrated system of encoder and decoder blocks used to process large amounts of text data, improving the accuracy and reliability of the model through training. The encoder block extracts information from the input, converts it into various hidden formats, and then processes it by the decoder block to ultimately generate the output format. The Transformer network can extract contextual information from more text, thereby gaining a deeper understanding of input content, making analysis more accurate, comprehensive, and effective [6]. Therefore, one of the key features of ChatGPT is its ability to generate continuous feedback that is closely related to the context. In addition, ChatGPT model technology is based on a proprietary "self attention mechanism", which can achieve advanced functions in natural language processing (NLP) tasks, and is considered a high fidelity embodiment of "emotional intelligence plus intelligence". On the basis of pre trained language model operation, the received input is generated into a natural language response and given to the chat robot for feedback to the user. This is the core idea of ChatGPT technology. Specifically, ChatGPT technology is supported and operated by artificial intelligence services such as natural language processing (NLP) technology, deep learning technology, automatic speech recognition (ASR) technology, automatic machine translation (MT) technology, automatic text generation technology, automatic question answering system (QA) technology, automatic dialogue system (DS) technology, automatic document summarization technology, automatic text classification (TC) technology, automatic text retrieval (IR) technology, etc, and through the development and alternation of these technologies, we continuously improve the accuracy of chat robots' answers.

**2.2. Hardware structure design.** Taking into account the developing period of the system, this paper uses some key technologies to realize the artistic design system of digital media. Figure 2.1 illustrates the hardware configuration diagram [7,8].

Choose dual core TMS320C6657 and DDR3-1333 series processors: apply to digital media art and design course, DDRS controller of the chip only support DDR3-1333 series processors. This combination will greatly enhance the system's ability in art and design. Due to different input and output interfaces, it is necessary to improve the core processor, memory, and bus interfaces. The following is a description of the capacity structure design of each power supply and memory. When selecting a circuit, it is necessary to add a certain margin according to Table 2.1. The necessary conditions must be met: a certain margin can be provided for emergency needs; Current ripple and noise need to be within an acceptable range [9].

In order to meet the above conditions, it is necessary to calculate the system power consumption reasonably. If the power consumption is too low, it can cause system crashes; If the power consumption is too high, it will increase the difficulty of power supply design. In order to apply AC-DC circuits for this purpose, it is necessary to convert the evaluation indicators of output accuracy and noise before use, in order to shorten the design cycle. Using the MUA30-220S05 power module, the conversion efficiency can reach up to 75%, the output voltage conversion accuracy is  $< \pm 1\%$ , and the noise is  $< 50\text{mV}$  [10]. Each layer of memory structure should have a larger capacity than the previous layer of memory, as shown in Figure 2.2. There are four levels of memory

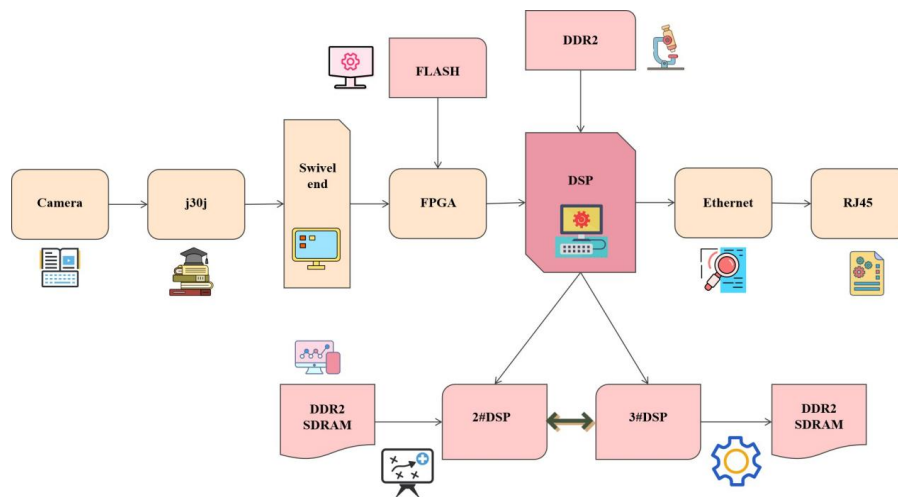


Fig. 2.1: Hardware Framework of Digital Media Art Design System

Table 2.1: Power consumption estimation of main circuits in digital media art design system

system circuit	Voltage/N	Current/A	Power consumption/W
DSP	1.36	4.7	5.63
FPGA	2.4	0.7	0.51
DSP	1.7	0.3	2.46
SRIO	1.6	0.9	0.55
DDR2	1.4	0.6	0.86
EMAC	1.3	1.7	2.81
Clock	3.4	0.7	1.63

capacity, with one level being on chip SRAM, which is slow and has a large capacity; The second level is off chip DRAM, with slightly slower speed and larger capacity; The third level is FLASH memory, which is the slowest and has the highest capacity; The fourth level is Web distributed storage, which is an indispensable part of the system. The SRAM inside the chip contains a Cache; The external DRAM of the chip contains BlockRAM. FLASH, as the system program boot, is responsible for uploading image data to the upper computer disk.

**2.3. Software Function Design.** Establish the whole software function in the form of plugins to simplify integration with the main system framework to achieve the design of digital media art design systems. The design features of each plugin are as follows. This image plugin is designed based on MapInfo platform, and the management functions include OpenCV library function to implement image processing related to digital media art design [11]. Content used: Image led control: responsible for taking image data, using the loaded image as the image led control. Image management: responsible for the integration of input and output models, processing and managing internal affairs. Image transformation: Select CV threshold mode to provide information and choose different processing methods for processing. The design of the video module is divided into three types, which are responsible for the transformation of the image into the 3D virtual image. Using VR technology to store the image data, then call the video source to produce CvCapture objects, which include camera data and video files. Once you’ve done all of this, loop the CvQuery frame function to retrieve the frame data from the CvCapture object. The loop ends and exits the program. To guarantee the precision of the query, the new frame data is transmitted by C code. Only new deep data can be called after processing. You have to restart the camera at this time.

Sound plugin design: Select BASS to complete the sample file operation. BASS supports platforms such

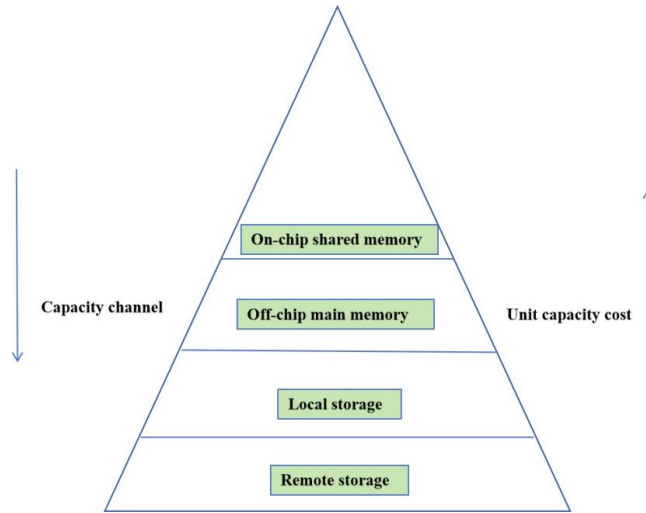


Fig. 2.2: Memory Capacity Structure

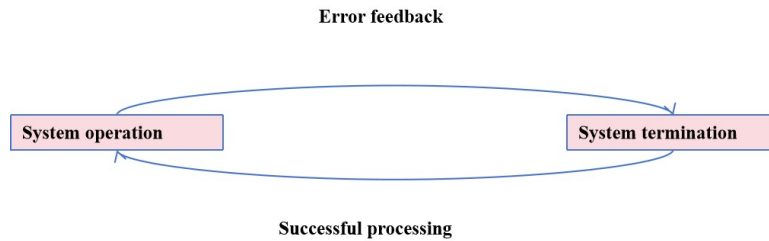


Fig. 2.3: Finite State Structure of System Operation

as XP and IOS.

The work programme is as follows:

- (1) Audio part: Using the bass loader control to guide the audio, using input input as the way, responsible for extracting audio data; The output is the handler responsible for displaying floating-point numbers [12].
- (2) Mathematical part: Choosing the camera network provides the frame information for the camera, applying the image quality control and motion control to extract the image contours. In order to prevent a system from sending error reports, it is necessary to create an error message, with the process running the system diagram shown in Figure 2.3.

The following steps will be taken when the error report is shown in the system: When the user makes a mistake, the system will open the box automatically and disable the current error. In order to provide timely feedback, we use the Nonupdate Box to record the errors that happened in the process. If there is an error message while the test is being executed, the system will send an error message; if it is finished, the system will continue; if there is an error message, the system will jump to a stop state. Based on the virtual reality technique, a digital media art design system has been developed with the combination of software and hardware.

### 3. Simulation experiments.

**3.1. Experimental Environment.** For the sake of simplicity of experiment description, we used the numerical simulation method to compare the time contrast of traditional digital media art and the design with this system. Various measurement results were used in the experiment, and rich experiment data were obtained, providing the reference basis for the next work [13-14]. The core of the VFD is TMS320C6657 processor. Based

Table 3.1: Comparison of System Operation Time

number	data size/B	Number of targets	Traditional systems		This article system	
			run time/ms	test result	run time/ms	test result
Image-1	512×300	8	13.266	Incorrect	11.556	correct
Image-2	512×300	2	2.366	correct	1.585	correct
Image-3	512×300	6	8.597	correct	7.233	correct
Image-4	512×300	10	10.255	correct	9.266	correct
Image-5	512×300	2	3.266	Incorrect	1.266	correct
Image-6	512×300	5	5.625	correct	4.266	correct
Image-7	512×300	6	11.266	Incorrect	10.266	correct
Image-8	512×300	4	10.543	correct	9.563	correct
Image-9	512×300	6	7.266	Incorrect	6.266	correct
Image-10	512×300	2	3.626	correct	1.266	correct

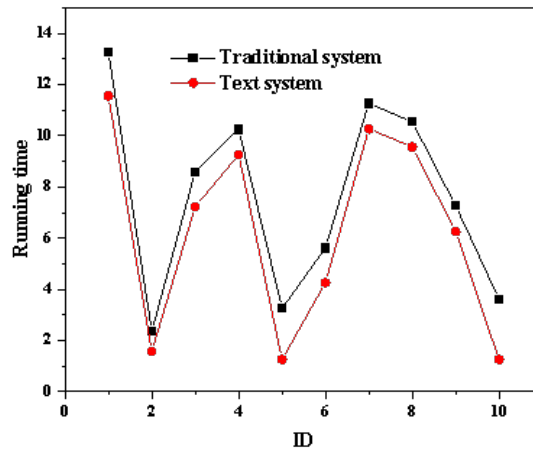


Fig. 3.1: Comparison of System Operation Time

on this, a test environment is created, and the image module is used to send 10 or more image data. Then, the data is sent to the system.

**3.2. Experimental Results and Analysis.** Test results of the calculation time required for digital media art design during the debugging process of the two machines are shown in Table 3.1 and Figure 3.1 [15].

The test results show that the system has the advantages of short running time, accurate target, and stable realization, and satisfying the system's quality requirements. There are three errors that require more time when using traditional digital media art and design to measure goals [16,17,18].

**4. Conclusion.** With the rapid progress of technology, today's educational concepts and models are constantly evolving and innovating. ChatGPT is a new artificial intelligence technology based on natural language processing. The emergence of this technology has also brought challenges and opportunities to education and teaching. Many input devices are important parts of the artistic and design platform of digital media, and they are also important parts of the system. In the art and design of digital media, the input device consists of the input device and the user's data pre-processing. So in terms of software design, in addition to commonly used

devices such as keyboards and mice, image plugins, sound plugins, and video plugins have also been designed to capture image information. In the aspect of hardware design, the dual-core TMS320C6657 and DDR3-1333 series technology were used to analyze the data. Processing of data. Based on virtual reality technology, a digital media art design system is developed by combining hardware and software. In the experimental part, it is proved that the method has a shorter time and better performance compared with the design by comparing the experimental results.

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