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Retraction

Retracted: Design and Implementation of Virtual Simulation Animation Experience Hall Based on VR and Sensing Technology

Wireless Communications and Mobile Computing

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] X. Luo, "Design and Implementation of Virtual Simulation Animation Experience Hall Based on VR and Sensing Technology," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 5405687, 7 pages, 2022.

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Research Article

Design and Implementation of Virtual Simulation Animation Experience Hall Based on VR and Sensing Technology

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In order to meet the needs of the design and feasibility of the virtual simulation animation experience hall, the author proposes a research based on VR and sensing technology. The main content of this research is the research of virtual simulation system based on VR and sensing technology, through the analysis of temperature sensing technology, using optical sensing technology and other methods, and finally constructing research methods based on VR and sensing technology through experiments and analysis. Experimental results show that when the light intensity is 0.5 mW, the voltage reaches 3.0 V, and the electrical quantity voltage increases with the increase of the nonelectrical quantity light intensity, which meets the design requirements of the sensor and is feasible for the design and implementation of the virtual simulation animation experience hall. *Conclusion.* The research based on VR and sensing technology can meet the needs of the design and implementation of the virtual simulation animation experience hall.

1. Introduction

In recent years, with the improvement of the quality of life, people pay more attention to the pursuit of cultural level, and the animation industry, as a development method of cultural inheritance, has gradually become an indispensable part of social development [1]. The development of Chinese animation technology and industry still faces many challenges and tests. In the process of animation industry development, it is an important strategy to further improve the development of creative products, production and broadcast of derivatives, production and sales, investment, and financing system.

With the continuous evolution of new technologies and the large-scale popularization of mobile intelligent terminal devices, portable media such as smartphones and mobile devices have begun to seize the market of traditional media [2]. People's demand for animation works has gradually turned to real-time portable and mobile viewing. When the user's demand plays a role in the upstream of the animation industry chain, the field of cartoon animation creation and publication begins to shrink, and the proportion of digital communication works increases significantly. Under this background, the new cultural formats of the animation industry mainly include digital comics, short video animations, and strip comics; these new formats all have the characteristics of the times such as "short-term, smooth and fast," immediacy, high interactivity, and fragmentation. The reason why advanced countries in the animation industry can achieve great development achievements is mainly due to their strong social atmosphere and cultural concept of appreciating animation. This not only cultivates consumer groups for the development of the animation industry but also provides imagination space for the development of animation products and also creates a large number of experts and entrepreneurs who focus on the animation industry [3].

Experiential animation has always existed as a consumption form with high experience demand; as an emerging form of experience, animation tourism has met the needs of animation fans. As a kind of tourism resource in my country, animation has been gradually accepted by the public and is increasingly sought after, although the domestic animation tourism has not yet formed a system. Some provinces and cities have begun to have the idea of developing animation tourism, and some have also appeared one after another, in the form of animation tourism, for example, many regions have set up “animation festivals” and established “animation cities”, trying to use animation resources as new tourism resources to promote the development of local economy [4], as shown in Figure 1.

2. Literature Review

With the rapid development of popular culture, the continuous innovation of digital special effects, and media communication technology, the animation industry represented by animation film and television, comic cartoons, animation games, multimedia animation products, etc. has developed rapidly and has gradually become another industry after the IT industry, emerging sunrise industry [5]. In developed countries such as the United States, Japan, and South Korea, the animation industry has not only become an important pillar industry to promote the transformation of economic structure, but also an important symbol of demonstrating and enhancing cultural soft power and competitiveness and an important channel for cultural expansion. Therefore, the position of the animation industry in the global political, cultural, and economic development pattern has been rapidly improved. Actively developing the animation industry has become the best way for many countries to enhance their national economic strength and cultural competitiveness. Management master Peter Drucker said: The competition between the world economy and industry today is not the competition between enterprise products, but the competition between development models. In order to promote the development of my country’s animation industry into an important pillar industry of the national economy and enhance my country’s cultural soft power and competitiveness, it is necessary to thoroughly analyze the development model of my country’s animation industry and its existing problems, actively learn from the experience of advanced countries in the animation industry, and innovate my country’s animation industry; the development model and path have made my country a real powerhouse in the animation industry [6]. With the rapid increase of the total scale of the animation industry, the main body of investment in my country’s animation industry has shown a trend of diversification, from the state-owned enterprises as the main body in the early stage of development, in order to the state-owned, private, joint venture and other diversified structures. In particular, the large number of nongovernmental animation enterprises and animation and comic production institutions has promoted the socialization, marketization, and commercialization of investment entities in the animation industry. Some private enterprises with relatively flexible operation mode and strong market competitiveness have gradually become the leading force in the animation industry in China and have triggered the continuous emergence of original animation works, which greatly improve the output and quality of original animations in China and expand their influence.

In view of the above problems, in order to design and realize the feasibility of virtual simulation animation experience hall, a research based on VR and sensing technology is proposed [7]. The main content of this research is the research of virtual simulation system based on VR and sensing technology, through the analysis of temperature sensing technology, using optical sensing technology and other methods; finally, through experiments and analysis, a research method based on VR and sensing technology was constructed, which effectively promoted the regeneration and development of the animation industry [8].

3. Research Methods

3.1. Virtual Simulation System of VR and Sensing Technology

3.1.1. System Structure. The design of the mold virtual simulation system follows the idea of software engineering design and implements the idea of layered layout and module composition; each functional module of the system design realizes three functional modules of scene roaming, mold knowledge explanation, and knowledge assessment according to needs, a friendly, easy-to-operate, and highly simulated system [9].

(1) Scene roaming module. When walking in the virtual training room, the roaming mode of traditional games is adopted, namely, the W, S, A, D, Q, and E, on the keyboard are used to achieve the action of moving forward and backward, turning left and right, and going up and down. Set the collision attribute to prevent the phenomenon of wearing mold and highlight the authenticity. The mouse clicks on the mold to be learned, the highlight effect appears, and the knowledge explanation module is entered, which is easy to operate; this visual learning method has a strong interest in knowledge and solves abstract materialization problems [10].

(2) Mold knowledge module. The training room resource database was constructed by 3D modeling technology; the module consists of three submodules: working principle, mold disassembly, and interactive training. The working principle submodule is based on the basic knowledge of the textbook as the carrier, and the basic structure of the mold is explained in detail. The mold disassembly submodule explains the specific processes of mold assembly and disassembly. The interactive training submodule explains the use of the mold in the form of dialogue animation [11].

(3) Knowledge assessment module. The system includes a variety of basic questions about molds, easy-to-error questions, and operation questions. When in use, the system will randomly and reasonably select questions to pass the game

The main model of the system is integrated with SolidWorks and 3Ds Max modeling software to build the scene model of the 3D virtual classroom and the database of molds and equipment. Texture maps and UI interface are processed by PhotoShops software [12]. Integrate the

Figure 1: Design and implementation of virtual simulation animation experience hall based on VR and sensing technology.

comprehensive resources into the Unity3D development platform and perform operations such as scene construction, model setting, and debugging effects; Visual Studio is selected as the programming tool, and C# is selected as the scripting language; finally, the project is packaged and released; the specific development steps are as follows as shown in Figure 2.

3.1.2. 3D Virtual Laboratory Development Process and Modeling of Digital Circuits. Designing a complete 3D virtual laboratory for digital circuits involves four parts: the design of the laboratory's appearance, the design of the internal structure, the design of circuit diagrams, and the simulation of realistic simulation phenomena. The specific development processes mainly include: (1) collect original materials; (2) 3D Max modeling; (3) make textures from original materials and bake the textures; (4) export 3D models; (5) assemble interactions; and (6) export to application software platforms. The above steps, from collecting materials to exporting models to application software platforms, require designers to design carefully each step, among which the most critical are modeling and assembly interaction modules [13]. This modeling is to establish a static laboratory model, and the organization interaction is to add components by custom on the static model of Unity3D to give the realistic properties of the laboratory. To bring the virtual lab to life, a C# script needs to be hung in the process to highlight the visual human-machine interaction and the interaction between elements.

This virtual laboratory selected 10 classic module components, mainly including: lantern control circuit, traffic light working state control circuit, light control logic circuit, serial number generator, two-way shift register, Ding-dong doorbell control circuit, faucet control circuit, water pump control circuit, modulo 11 addition calculator, and light control switch control circuit [14]. The specific 3D virtual laboratory frame design is shown in Figure 3.

3.2. Research on Various Sensing Technologies

3.2.1. Temperature Sensing Technology. The temperature sensing technology experiment is one of the more important contents in the comprehensive experiment series [15]. Typically included in this lab are as follows: Measure the resistance-temperature characteristics of the negative temperature coefficient thermistor, and use the data processing method of straight line fitting to obtain its material constant; understand the circuit structure of the temperature sensor with the thermistor as the detection element and the selection principle of circuit parameters; learn the basic methods of analyzing the voltage-temperature characteristics of temperature sensors using linear circuit and operational amplifier circuit theory; learn the design methods of resistance-type, voltage-type, and current-type temperature sensors; and understand the numerical calculation of temperature sensor circuit parameters based on iterative method technology [16].

According to the existing experimental instruments, after completing the measurement and recording of all experimental data within the specified time, the measured data can be input into its supporting software one by one to obtain the corresponding experimental curve, verify the experimental conclusion, and analyze the experimental results. In such an experimental process, it is difficult to understand the overall change trend of the data in real time during the process of the experiment so that even if there is a problem in the experiment, it is often necessary to complete all the content and use the supporting software to verify, which is very unfavorable to discover and correct errors in time during the experiment [17].

Based on the above reasons, it is very necessary to improve the existing temperature sensing technology experimental system, combine traditional experimental data processing methods with modern computer software technology, realize real-time acquisition of measurement data, realize real-time display and drawing of the collected data, curve, save results, and print functions [18].

The circuit interface connected with the existing experimental instrument is shown in Figure 4 (some common basic circuit modules are omitted in the figure, such as power module and reset circuit).

In order to minimize the influence of the new circuit on the original instrument, the interface circuit obtains the voltage signal of the original experimental instrument through the emitter-stalk circuit composed of operational amplifiers. Similarly, in order to make the acquisition results consistent with the original experimental instrument, the interface circuit also obtains the reference voltage of the original instrument through the emitter-following circuit as the reference voltage for A/D conversion [19].

The single-chip microcomputer uses the interface timing to collect the results of A/D conversion; in order to meet the requirements of different experimental contents, the upper computer software can set the acquisition frequency and multiple averaging methods of the single-chip microcomputer

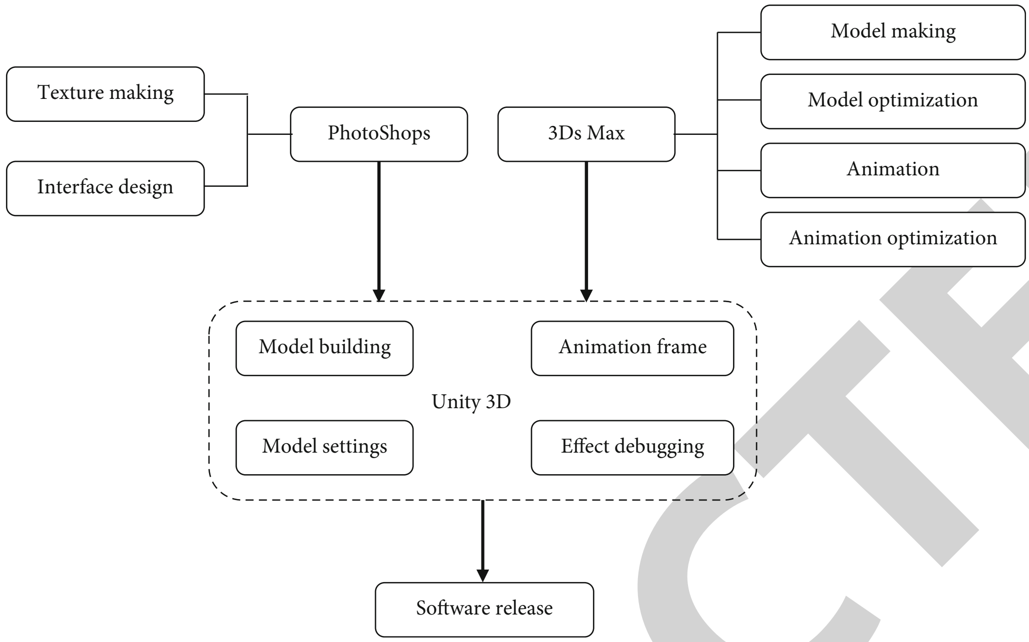

Figure 2: System development process.

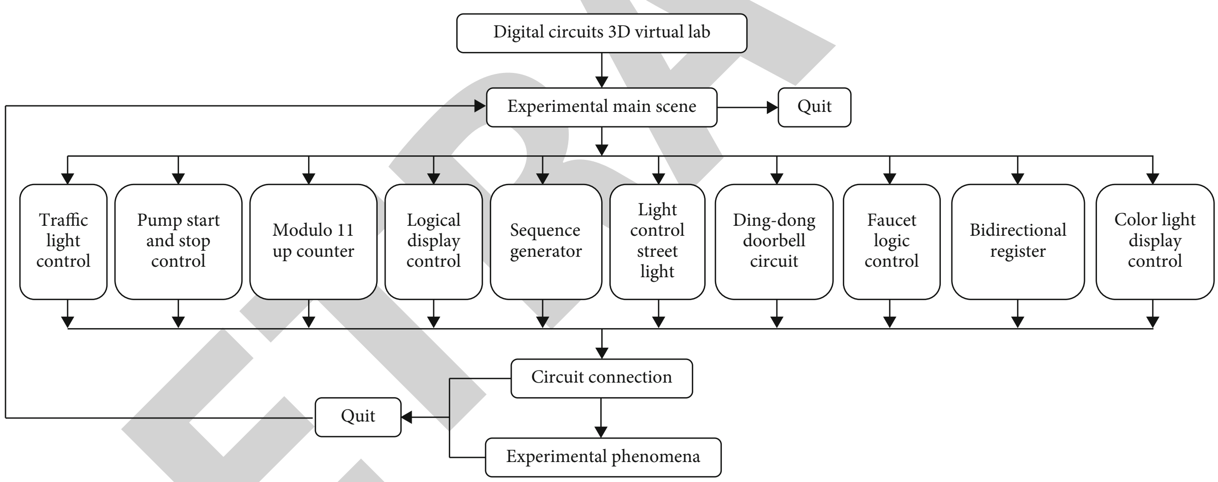

Figure 3: Frame design of 3D virtual laboratory.

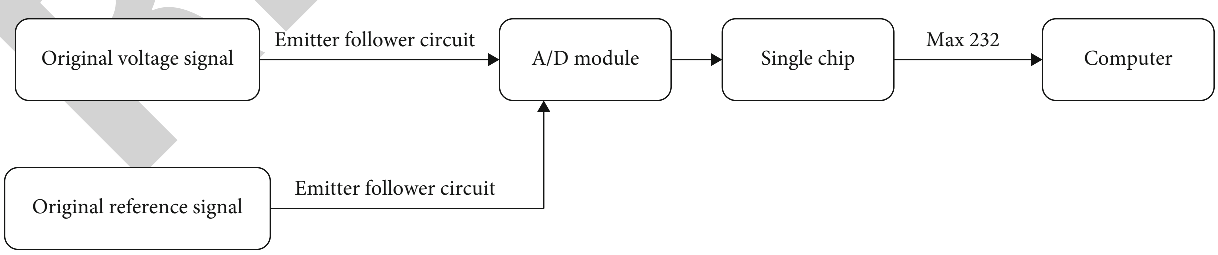

Figure 4: Interface circuit.

according to the needs; in addition, the single-chip computer needs to use asynchronous serial communication; the technology establishes communication with the upper computer [20]. Although the single-chip microcomputer has the function of serial communication, the signal level provided by the single-chip microcomputer is different from the standard of the serial port signal level on the computer, so the level conversion is carried out through the Max232 chip.

3.2.2. Light Sensing Technology. With the rapid development of photoresistor components, light sensors have gradually replaced other traditional sensors in many occasions. However, at present, there are relatively few experiments on optical sensors, and optical sensors are an innovative point of experimental reform. Some use the FD-LS-A photosensitive sensor photoelectric characteristic experimenter for photo sensor experiments. It is composed of photoresistor, photodiode, phototransistor, silicon photocell, four photosensitive sensors, adjustable light source, resistance box, and digital voltmeter [21].

Photoresistors are also known as light guides. The commonly used materials are cadmium sulfide, in addition to selenium, aluminum sulfide, lead sulfide, and bismuth sulfide. These fabrication materials have the property of rapidly decreasing their resistance when irradiated with light of a specific wavelength [22]. This is because the carriers generated by the light are all involved in conduction and drift under the action of an external electric field, the electrons run to the positive pole of the power supply, and the holes run to the negative pole of the power supply so that the resistance of the photoresistor drops rapidly. In the experiment, Rc represents the photoresistor. It can be seen from Figure 5 that the resistance of the photoresistor varies with the light intensity.

When the light intensity change causes the resistance value of the photoresistor to change, the output voltage of the bridge also changes accordingly, thus realizing the conversion between light intensity and voltage. Since the bridge is unbalanced, the output voltage is generally millivolts stage, so a differential amplifier circuit should be added:

$$R_1' = \frac{R_1 \cdot R_G}{R_1 + R_G}, V_{i1} = \frac{R_G}{R_1 + R_G} V, \quad (1)$$

$$R_2' = \frac{R_2 \cdot R_3}{R_2 + R_3}, V_{i2} = \frac{R_3}{R_2 + R_3} V, \quad (2)$$

$$V_0 = \frac{R_f}{R + R_1'} \left(\frac{R_f + R + R_1'}{R_2' + R + R_f} V_{i2} - V_{i1} \right). \quad (3)$$

Equation (3) is the expression of the voltage-light intensity characteristic of the photosensor. The functional relationship expressed by Equation (3) is nonlinear; but through appropriate selection of circuit parameters, this relationship can be approximated as a straight line, and the error caused by this approximate straight line is related to the range of the sensor's light intensity [23, 24]. In order to minimize the effect of temperature on the photoresistor, make the light source far away from the photoresistor for experimental research.

Paste the photoresistor and a 0-2 mW light intensity tester together, and fix it on the basic solar cell measuring instrument; starting from the light intensity of 0.05 mW, measure the resistance of the photoresistor with a digital multimeter every 0.05 mW until 0.55 Up to mW; the result of the resistance-light intensity curve fitted by the recorded experimental data is shown in Figure 6.

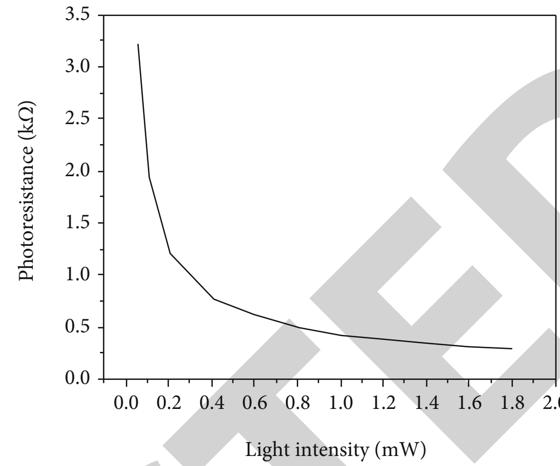

FIGURE 5: The curve of the resistance value of the photoresistor with the light intensity.

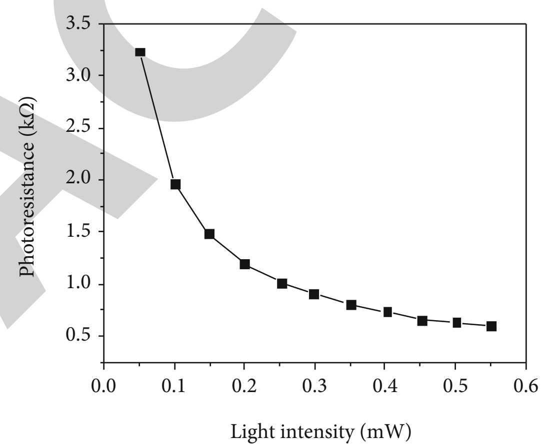

FIGURE 6: Resistance value of photoresistor element-light intensity characteristic test curve.

4. Analysis of Results

The iterative method is used to calculate the resistance values of R and Rf in the circuit. According to the calculation rules of the iterative method, $R = 0.3228\text{k}\Omega$ and $R f = 3.5753\text{k}\Omega$ are finally selected. Replace the photoresistor element with a variable resistance box, connect it to the two jacks of the "photoresistor" on the control panel of the light sensing technology experimenter, and adjust the "V" adjustment on the control panel to make the power supply voltage of the access bridge that is about 3 V. Then, connect the digital voltmeter (voltage gear) to the two jacks of the output V0 on the instrument control panel, and connect the resistance value of the resistance box to the RG1 value corresponding to the photoresistor at the initial light intensity G1 (0.05 mW), and then turn the "zero knob" to make the V0 output zero [25]. Keep the position of the zero adjustment knob unchanged, and adjust the resistance value of the resistance box to the RG3 value corresponding to the light sensitive resistor at

Table 1: Sensor voltage-light intensity characteristics.

Light intensity/mW	Voltage/V
0.05	0
0.1	0.6
0.15	1.1
0.2	1.4
0.25	1.7
0.3	1.9
0.35	2.1
0.4	2.4
0.45	2.5
0.5	2.7
0.55	3.0

the highest light intensity (0.55 mW). Similarly, the output V0 is measured with a digital multimeter, and the V is adjusted by rotation so that V0 is the V3 value (3V) required by the design. After zero and range adjustment, disconnect the connection between the resistance box and the optical sensing experimental technology instrument. The light intensity tester and photoresistor are fixed on the solar cell basic characteristics demonstration tester. The lead of the photoresistor is connected to the two jacks of the photoresistor on the control panel of the optical sensing instrument. Turn on the solar cell basic characteristics demonstration tester, in the process of reducing the distance between the photoresistor and the light source and increasing the light intensity. From the initial light intensity, V0 was read by digital multimeter every 0.05mW until the maximum light intensity of the experiment. The experimental results are shown in Table 1.

It can be seen in Table 1 that when the light intensity is 0.5 mW, the voltage reaches 3.0 V, and the electrical voltage increases with the increase of the nonelectrical light intensity, which meets the design requirements of the sensor.

5. Conclusion

In order to design and realize the feasibility of virtual simulation animation experience hall, the author proposes a research based on VR and sensing technology. The main content of this research is the research of virtual simulation system based on VR and sensing technology, through the analysis of temperature sensing technology, using optical sensing technology and other methods, and finally constructing research methods based on VR and sensing technology through experiments and analysis. As an emerging technology in the field of computer, virtual reality is not only a comprehensive embodiment of the frontier of modern science and technology, but also shows good integration and service with other disciplines. The combination of virtual reality and animation art has formed a new form of artistic language; the virtual simulation system created by the close integration of technological tools and artistic thinking has greatly improved the technological level of animation production. Animation art enhances the simulation and artistry of virtual reality with the help of unique expression language, creates a new aesthetic experience, and promotes the regeneration and development of the animation industry.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declares that there is no conflicts of interest.

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