Influence of coastal beach stability based on interactive VR technology and bookbinding design of city library

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Received: 11 June 2021 / Accepted: 22 July 2021 / Published online: 12 August 2021
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Abstract
This paper first introduces the design and key technologies of the whole interactive VR system, focusing on the principle of the node-based interactive VR system program, the integration of available modules, and the architecture of the plug-in system. It also allows developers to use visualization programs to create scenarios to complete the required design activities. Based on this, this paper uses PSR rough sets and ARIMA model to evaluate the spatial structure strength of beach stability under the combined action of natural and human factors, clarify the potential factors, and to some extent predict the future development trend of L beach. The results of this study illustrate the law of estuarine bank erosion and the theory of ecological stability, which is of great significance to regional wetland safety and beach stability. Finally, by using the methods of literature survey and network survey, this paper selects 13 different first-level public libraries as samples to investigate and study the development of bookbinding mode. There are four characteristics of library bookbinding: personalized intelligent service, interactive three-dimensional service, space reconstruction service, and virtual experience service. At the same time, the paper analyzes the existing problems and points out that it is urgent to strengthen the bookbinding management plan of public libraries and strengthen the service scope and depth of public libraries, so as to improve the necessary functional requirements of public libraries. Moreover, the bookbinding plans of public libraries in different regions are unbalanced and need to be improved. In this paper, the results of the research on the stability of coastal beaches based on interactive VR technology are applied to the bookbinding design of the city library, so as to promote the development of the bookbinding design of the city library.

Keywords Interactive VR · Beach stability · Library · Book decoration

Introduction
Harpia is an interactive VR software in the field of computer vision. Interactive VR system is only for professional education and training. Harpia is compatible with the Linux platform and released the version of the Windows platform, which supports the use of Python scripting language (Sharifan and Ghahraman 2007). In addition, Harpia’s user interface is made of GTK, with beautiful UI and friendly human–computer interaction design. Based on this point, the purpose of this paper is to investigate the L estuarine wetland beach area, to evaluate the stability advantages of the estuarine wetland beach, and to identify the main driving forces affecting the bank erosion and ecological stability (Tajbakhsh et al. 2015). The horizontal and vertical processes of dynamic deposition and erosion of wetland banks in the L area in the recent 30 years were analyzed by using an isotope tracer and GIS. According to the results of the annual survey, the time scale of the beach deposition process was determined, and the sediment discharge of the L river was investigated and analyzed (Tornros and Menzel 2014). The critical dynamic condition of sediment transport by runoff is confirmed by the interaction between runoff and beach sediment. The relationship between beach sediment and beach stability was investigated by using the spectrum analysis method. Based on the grain size distribution characteristics of sediments, the hydrodynamic process in the

This article is part of the Topical Collection on Environment and Low Carbon Transportation

Responsible Editor: Sheldon Williamson

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beach area is studied (Zareabyaneh et al. 2016). Finally, with the advancement of digitalization, the intelligent level of the public library is deepening and gradually transforming to the smart library, and its service content, concept, and mode are affected. However, there are still some problems in the bookbinding scheme of public libraries. Through the investigation of the public library, this paper studies the bookbinding scheme of the public library, so as to provide practical support for the development of the bookbinding of the public library. The new public library law makes it clear that the public library must formulate the bookbinding plan and also makes it clear that the public library should take the responsibility to promote the bookbinding. In this context, the public library needs to realize the transformation of intelligent service (Mishra et al. 2007). However, there are few researches on bookbinding practice in Chinese public libraries, and the research results of intelligent service in public libraries are also insufficient (Wu and Chang 2002). This paper investigates the current situation of bookbinding in China’s public libraries, examines the existing problems, and puts forward research suggestions, so as to provide theoretical support for bookbinding, link books with public libraries, and comprehensively enrich relevant research results (Raziei et al. 2007). Then, in view of the problems, we take the corresponding measures: strengthen the intelligent management, strengthen the cooperation and user participation, strengthen the management of bookbinding and layout, integrate the relevant technology, strengthen the construction of cloud platform, and improve the level of information service for the hardware equipment and technology platform and library special training. At the same time, we should strengthen the construction of an information security system (Toufani et al. 2011).

Materials and methods

Remote sensing data acquisition and processing

In this study, the wetland area of L estuary was selected as the basis of Landsat 30 m resolution remote sensing image in recent 33 years. In this paper, the characteristics of beach erosion in L estuary wetland are studied. In order to reduce the data error caused by photography time, flood season, and hydrodynamic weather change, the low tide period after September is selected as the time scale of remote sensing images.

Study on horizontal spatial erosion dynamics and Landsat of L estuary wetland in recent years™. Based on the correlation of remote sensing images, the erosion rate ($V_s$) was obtained by using GIS to determine the change of bank erosion. The main indexes of horizontal spatial clustering of L estuary wetland bank area were calculated according to the following formula:

\[ V_s = \frac{S_{i+1}-S_i}{t} \]  

NSM motion represents the year-on-year distance (km/a) along the coast in horizontal space and is calculated by the baseline method of the cross section. The digital shoreline analysis system (DSAS) is used for the analysis. A baseline is established at the lower limit of the L estuary wetland reserve to ensure that the annual coastline is on the same side of the baseline. A basic cross section with a horizontal distance of 25 0m was set up, with a total of 186 points.

The length ($L$) and distribution of the shoreline were obtained from remote sensing images using normalized water index (NDWI) and corrected by DSAS. The change rate of shoreline length ($L_c$) reflects the change degree between the length of the previous year and the length of the next year. Use the following formula:

\[ L_c = \frac{L_{i+1}-L_i}{L_i} \]  

Relationship between beach deposition and runoff cycle

The specific steps of spectrum analysis are as follows:

The first step: data centralization, fast Fourier transform (FFT), the original data $T_x$ into $X_T(f)$.

The second step is to calculate the strong spectral density according to $X_T(f)$.

\[ P(f) = \frac{|X_T(f)|^2}{T} \]  

The formula of spectral density is as follows:

\[ P(f_i) = \frac{A_i^2 + B_i^2}{T} \]  

The third step is to draw the spectrum.

According to the calculated power spectral density $P(f_i)$ and the frequency of line $f_i$, the spectrum can be obtained.
The time period is calculated according to the frequency corresponding to the maximum value, which is the inverse value of frequency response.

**Calculation of tidal current characteristics**

According to its nature, tides can be divided into regular semidiurnal tidal current movement and irregular semidiurnal tidal current movement, regular diurnal tidal current movement, and irregular diurnal tidal current movement. The axis ratio \( f \) was used as the judgment basis:

\[
F = \frac{W_{oh} + W_{K_i}}{W_{M_2}}
\]  

(5)

In which, \( W_{oh}, W_{K_i}, W_{M_2} \) represent the long half axis length (cm/s) of the ellipse of the main lunar diurnal tidal current, the solar declination diurnal tidal current, and the main lunar semidiurnal tidal current, respectively.

**Verification and prediction of artificial beach life**

If the amount of sediment is small, the beach can not be scoured. If the amount of sand throwing is too large, it will be relatively safe, but it will cause high costs and may not achieve the balance of revenue and expenditure. Of course, in order to restore and expand the beach and build a natural coastal ecosystem, the beach should throw sand as much as possible:

\[
q_L > \text{ALNQU}
\]  

(6)

where \( q_L \) is the total amount of sand dumping at the beach throwing stage (m\(^3\)), \( L \) is the length of the littoral sand throwing section (m), \( N \) is the life expectancy (a) of beach sand throwing, and \( QU \) is the average erosion width (m) of \( N \) years before beach sand raising (m\(^3\)/m·a), \( a \) is the coefficient, which is related to the coastal wave intensity. According to the research experience of foreign scholars, “1.2” is adopted, which means that the erosion rate of the coastline is 1.2 times higher than that before sand throwing.

According to this formula, the total amount of sand thrown by the second phase project of W City artificial coast is 1.02 million m\(^3\). The length is 1600 m, and the total amount of erosion is 23.24 m\(^3\)/m. It lasted 4 months. After that, the second phase of the project is completed, and the life of the artificial beach can reach 7.62 years. The time interval for further maintenance of the beach project is 5–7 years, which is considered to be successful. Therefore, it can be considered that W City artificial beach resort phase II project is successful.

**Results**

**Basic situation analysis of beach water area**

According to the observation data, the cumulative frequency statistics of the wave situation in the sea area is carried out, and the wave rose diagram is shown in Fig. 1. According to the analysis of monthly observation data, it is generally affected by cold waves and strong wind, and strong waves often occur in winter. In addition, strong waves often occur in spring and autumn. In December, ≥2.4 m, the wavelength frequency was 3.3%, followed by October (2.5%). In summer, the sea is calmer.

The storm surge in the study area usually manifests as a cold wind from north to south. As the cold wave and storm pass, the wind pressure changes to the northeast to form a confrontation, and a regional strong wind is formed in the B sea area, which causes the water level to rise rapidly. The study area is an area where hurricane disasters frequently occur and have a greater impact. History records that strong storm surges have occurred many times in this area.

Consistent with the comprehensive analysis of storm surge data of port S in recent years, the storm surge data information and digital simulation results adjacent to the Y groove show the distribution of storm surges in the southern part of sea B (Fig. 2–Fig. 3), and the average storm surge increases in artificial coastal areas. It can reach about 1.5 m, and the height can reach about 250 cm, and the highest can reach 3.0 to 3.5 m (Y groove has reached 3.5 m).

The spatial distribution of the largest increase in water volume during Hurricane 9216 is shown in Fig. 3:

It can be seen from Table 1 that sediments with an average particle size of 0.10 to 0.20 mm are distributed in multiple areas in the sampling area, and sediments with an average particle size of <0.05 mm appear in the central part of the measurement area. The sediments with an average particle size between 0.05 and 0.10 mm are not only distributed in the central and western parts of the detection area but also scattered in the sampling area.

As shown in Table 2, during the tide period, the maximum average sand content on the vertical line of the high and low tides is 0.004–0.205 kg/m\(^3\) and 0.005–0.182 kg/m\(^3\), respectively. The maximum average sand content of the vertical tidal line at high tide is much higher than the maximum average sand content of the vertical infiltration streamline at low tide; at low tide, the maximum average sand content is between 0.020–0.030 kg/m\(^3\) and 0.020–0.042 kg/m\(^3\).

**Evolution analysis of beach erosion and deposition**

After the completion of the first phase project, six profile protection detection points will be set at the trailing edge of
the artificial bank. The location of the base point is shown in Fig. 4.

In the past 7 years, the profile evolution of the W City artificial beach project after two phases is shown in Fig. 5.

According to the cross section of the data measured in the last 3 years, the position of the cross section is shown in the front section. Finally, it is concluded that 6 months after the completion of the first phase project, 18 months after the completion of the second phase project, and 3 months after the completion of the second phase project in W City, the erosion rate of the same width was calculated.

In the first phase of the project, the erosion on the west side of the beach is relatively light, while the erosion on the east side is relatively serious. During the first 6 months after the implementation of the project, the erosion was serious and the shoreline retreated rapidly; 18 months after the completion of

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**Fig. 1** L. Bay-10.m water depth wave rose diagram

**Fig. 2** 8509 typhoon process maximum water increase spatial distribution map
the project, the erosion rate slowed down, obviously showing that the erosion at the root of dam D slowed down. The total result of land erosion is that the shoreline is reduced by two thirds and the beach cultivation fails.

Three months after the start of the second phase project, the shoreline retreat is not obvious. Subsequently, the sediment throwing was recorded in sections P3, P4, and P5, and the shoreline showed a high degree of coastal siltation, but the sediment throwing in sections P1 and P6 was not removed, so there was a very small retreat phenomenon, and the retreat value was close to 10%.

Seven months after the second phase project, the shoreline is generally in a backward state, but the proportion is lower than that of the first phase project, which indicates that the second phase project is more successful and the shoreline is relatively stable. The changes are shown in Table 3.

Using the regional terrain analysis software (rmap) to analyze the profile, the volume change table at the width of the artificial coast profile is calculated (Table 4).

Three months after the implementation of the second phase project, the average grain size of the beach sediments is more refined. The diversity became lower but still better on the whole. The negative polarization of skewness is serious, but the whole is still symmetrical. The kurtosis shows wide kurtosis, but the narrow kurtosis is still dominant. It can be seen that after 3 months of construction, due to the influence of dynamic action, the surface sediments and the original beach materials are mixed and refined, resulting in the low diversity coefficient (see Fig. 6).

Seven months after the implementation of the second phase project, the average grain size of coastal sediments continued to refine. The diversity became worse, but the overall was still better. The skewness changes from positive to extremely positive. The kurtosis changes from wide to very narrow, and the main kurtosis is a narrow peak. The beach is still in the changing period, affected by waves and other factors. The mixing of surface sediments with finer original beach material results in finer grain size and poorer diversity (see Fig. 7).

### Verification of beach stability

In order to study the wave changes in the sea area near the artificial beach before and after the construction of phase II protection project, 11 wave measurement points were placed in the model. Among them, 3, 2, and 6 wave measuring points

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**Table 1** Percentage of various sedimentary materials

| Sedimentary material | No. of samples | Percentage | Sedimentary material | No. of samples | Percentage |
|----------------------|----------------|------------|----------------------|----------------|------------|
| Clay silt            | 1              | 2.40%      | Fine sand            | 37             | 88.0%      |
| Silt                 | 1              | 2.40%      | Sand                 | 1              | 2.40%      |
| Sandy silt           | 1              | 2.40%      | Medium fine sand     | 1              | 2.4%       |
are located in the open sea, near the gate and in the Bay, as shown in Fig. 8.

Generally speaking, after the completion of the second phase protection project, the wave conditions in the experimental area can be greatly improved, the direction of the wave can be changed, and the shore current cannot be fully extended. Therefore, from these two aspects, the coastal erosion situation should be further improved after the completion of the second phase protection project, which is in line with the actual situation of the investigation.

Before the second phase project and after the implementation of the protection project, the H13% wavelength range of each observation point is shown in Fig. 9.

Figure 10 shows the plane model distribution of long wave type under the action of annual average wave and strong storm tide.

After analysis, the main conclusions are as follows: when the second phase protection project is not constructed, the sea area is open due to the insufficient coverage of NE wave, which makes the wave starting point slightly different from the wave displayed by the initial artificial coast. After the implementation of the second phase project, due to the blocking effect, the wave diffracts during the process, which changes the direction of the wave and shortens the strong shore current caused by the oblique wave. Due to the influence of the branch line barrier, under normal wave conditions, its shoreline on the beach may be blocked, so it cannot penetrate the whole coast. After the implementation of the second stage protection project, the wave height in the protection area will be greatly reduced. Under the normal water level, the amplitude of wave height is much higher, and the proportion of wave height behind the dam is about 80%. However, due to the flowing water level in the storm, some of them enter the protection area, resulting in the phenomenon of crossing the breakwater, the wave height behind the dam is relatively low, about 60%.

In order to determine the extent of beach erosion qualitatively and quantitatively, Fig. 11 compares the changes of beach elevation at the beginning of completion and half a year after completion. It can be seen from the figure that since the completion of the project, the whole beach has been in the stage of complete erosion. The erosion in the east is the most

| Table 2 | Statistics of measured sand content in the sea area of the project |
|---------|---------------------------------------------------------------|
|         | Measuring point | Spring tide | Neap tide |
|         |                | High tide | Ebb | High tide | Ebb |
|         |                | Max | Mean | Max | Mean | Max | Mean | Max | Mean |
| S-1#    | 0 | 0.003 | 0.01 | 0 | 0.024 | 0.017 | 0.023 | 0.015 |
| S-2#    | 0 | 0.004 | 0.01 | 0 | 0.02 | 0.015 | 0.02 | 0.014 |
| S-3#    | 0.2 | 0.096 | 0.18 | 0.086 | 0.03 | 0.023 | 0.042 | 0.021 |
| Mean    | 0.1 | 0.034 | 0.06 | 0 | 0.025 | 0.018 | 0.028 | 0.017 |

Fig. 4 Profile evolution after two phases of man-made beach construction in W City in recent 3 years (1)
serious, with a height change of more than 3 m, while the erosion in the west is relatively light, especially near the dam head in the west with a slight erosion, and the extent of siltation is about 1 m. The conclusion is consistent with the landform revealed in the field investigation.

According to the investigation, the coastal sandy land is in a state of severe erosion. It can be seen from the site that the western part of the beach is well maintained, but a large number of geotextiles have been exposed in the middle. It can be seen that most of the beach sand has disappeared, while the eastern part of the beach has almost completely disappeared.

Topographically, the remaining beach at the root of dam D in the west of the beach is relatively wide, reaching about 100 m, with a gentle slope (Fig. 12a), and the intertidal sediments are relatively soft. The shoreline is arched, and sand grains are formed underwater. From the west and the middle of the beach, the width of the remaining beach narrows rapidly, accompanied by obvious eroded rocks. In the middle of the beach, the width continues to decrease, the intertidal geotextiles begin to expose, and rock erosion develops (Fig. 12b). The topography of the eastern and central parts of the beach is seriously degraded, and the erosion position is gradually close to the breast wall and the root of the coastal ecological dampproof dam, showing a straight edge shape (Fig. 12c). The height can be close to 1 m. The sand body between the geotextiles is cleaned up by the waves and moves to the bank. Almost all of the upper water section of the beach is lost (Fig. 12d). There is still a small amount of sand body at the root of the eastern dam.

During the field inspection, sand samples were collected from the beach sand and analyzed the particle composition. Figure 13 shows the average size of beach sand at different locations. According to statistics, the size of the bank line near the base of Xiba is small, and the median particle size is 0.68 mm, which is similar to the design size of the original sand. From the west to the east of the beach, the particle size of sand began to decline, about 0.4–0.5mm.

| Profile | Project | 6 months | 18 months | Total percentage (%) | Project | 3 months | 7 months | Total percentage (%) |
|---------|---------|----------|-----------|----------------------|---------|----------|-----------|----------------------|
| P1      | 168     | −63.8    | −18.00    | −48.61               | 126.3   | −13.00   | −          | −10.29               |
| P2      | 169     | −61.9    | −49.1     | −65.70               | 92.13   | 3.00     | −20       | −18.45               |
| P3      | 172     | −82.9    | −49.22    | −77                  | 87.00   | 8.00     | −10       | −2.3                |
| P4      | 175     | −100.22  | −55.00    | −88.59               | 121.00  | 11.00    | −15       | −3.31               |
| P5      | 100     | −49      | −31.5     | −80.09               | 73.00   | 2.00     | −         | 2.74                |
| P6      | 129     | −79.6    | −6.00     | −66.55               | 145.00  | −14.00   | 5         | −6.21               |
| Mean    | 152     | −72.9    | −34.8     | −71.05               | 107.4   | 11.67    | −10       | −6.30               |
It is worth noting that the characteristic range is different from the distribution law of natural sand particle size. Under natural conditions, the sand size of the strong wave area is generally coarse, while that in the weak wave area is smaller. However, the artificial beach of Binhai New Town Beach in W City is divided into two layers: the top layer is about 1.5–2m of newly laid beach layer, and the bottom layer is extremely fine sand with a particle size of 0.10–0.13 mm. Two layers of sediment of different particle sizes are separated by geotextiles.

In fact, as shown in Fig. 13, after the beach was rapidly eroded, the geotextile was damaged by waves, resulting in the mixing of two different particle sizes of sand. For the west root of the slope, due to the sand accumulation, the newly laid beach sand is not mixed with fine sand, while the sand erosion part is mixed, resulting in the decrease of particle size. The conclusion is consistent with the results of the coastal geomorphological analysis.

**Discussion**

**Current situation of city library service based on interactive VR technology**

Public library virtual experience service is a deep service experience based on virtual reality (VR) technology. Virtual experience service integrates three aspects of smart public library service: management and retrieval of library resources, VR reading, and navigation and site exploration. In the surveyed public libraries, the virtual service experience is mainly integrated into virtual reality reading. For example, H Provincial Library provides users with a wide range of visual VR experiences, including safety science and a special demonstration of drug scenes. J Provincial Library uses VR (virtual reality) technology to experience digital culture, VR New Year celebration, and other virtual reality activities and continuously updates VR activity materials (Abbasi et al. 2019). In 2019, it created a new VR scene, that is, using the traditional customs and folk customs during the spring festival to design the scene, using the aforementioned conditions to display and design the interactive life experience scheme, so that users can further experience the spring festival culture and enhance their understanding of traditional culture. The library of L province creates a VR experience area and creates deep immersion scenes for users by using traditional cultural virtual reality technology (Bazrafshan and Khalili 2009). S Provincial Library, Hb Provincial Library, and HN Provincial Library provide virtual reality (VR) experience activities and apply the management and recovery of library sources combined with VR technology to the process of literature retrieval. The system can guide users to carry out specific operations (Da and V. d. 2004). For example, S Provincial Library carries out 3D modeling of itself, accurately displays the location of

![Table 4](image)
library resources in 3D space, and provides users with resource navigation services. SH Provincial Library has established a “virtual reality library service system.” In terms of spatial navigation and roaming, the spatial features of S Provincial Library are presented in three-dimensional pictures, supplemented by text instructions, so that users can clearly understand the spatial features of the library.

Due to the high cost of using VR technology and high technical barriers, the application depth of VR technology in public libraries is relatively shallow, and the scope is relatively limited. See Table 5 for the internal service development of public libraries (Ervural et al. 2016).

**Combination of bookbinding design and sensory interaction**

More and more e-book manufacturers are focusing their technological development on simulating the texture of paper books. By recreating the screen material, readers have the illusion of reading books on paper. Therefore, the content of paper books and the sensory interaction with readers are irreplaceable. No matter what the purpose of reading is, the article always thinks that reading is a kind of visual experience. What books bring to people is not only to find information, but also an interactive process. In this process, just like spatial planning, people will get different sensory experiences, such as touch, hearing, and smell. Lu’s book of five senses of cognitive experience explores the relationship between books and sensory experiments (Fathabadi et al. 2009). Through the arrangement of the device, readers can get five different sensory data of smell, touch, hearing, sight, and taste. As a book, it should first enable the readers to obtain the required content and then wake up the readers’ spiritual perception through the smell of ink and paper and leave an impression on it. At the same time, in the process of further reading, the readers can understand what the author wants to express and convey through touch and vision. Therefore, designers must create a reading environment to mobilize readers’ emotions, not just the transmission of information.

**Visual sense in book design**

As we all know, sensory stimulation in books always starts from vision. For readers, visual experience is a more direct feeling, which has become a necessary condition before the formation of the reading experience. As the first way for people to understand things, vision often brings readers the first impression and experience of a book. And in the next reading process, the content of the book can stimulate the reader’s senses.

The function of the visual sense in books has many aspects, and it is also the most complex part of all senses. In book design, subtle changes brought by color, graphics, and visual characters will bring different emotional mobilization to readers. As a designer, we need to fully understand the content and audience of books before making plans and creating reasonable visual instructions. For example, some popular science books tend to be more rigorous and calmer in color and appearance so that readers can focus on the content itself, so as to avoid excessive psychological changes (Kempes et al. 2016).
The reader’s perceptual influence is not only the accurate transmission of the book’s content. Only by making the content of the book a visual experience and focusing on the whole plot of the book can the information be better conveyed.

On the sense of hearing in book design

As a paper reading, physical books usually have little connection with listening. “The influence of ‘listening’ embodied in books is not so easy to be observed, but its influence is subtle. People’s hearing is often more delicate and subjective than vision. This is because sound can activate human feelings more strongly and more easily and mobilize their emotions. That is why people are always moved by music. Different thickness and texture of the paper produced by the sound are also different, which makes each book have its own unique sound, which constitutes the auditory reading.
About the sense of smell in book design

The sense of smell is not as subjective and easy to describe as other senses. Different people have different descriptions of the same smell. Human perception of smell mainly comes from long-term fixed thinking mode, and smell is always related to the established things in people’s daily life. The olfactory stimulation in the process of reading books comes from the selection of materials and printing ink. Readers can even distinguish the year signs from the smell and taste. Different olfactory experiences will make readers have different feelings (Khalili et al. 2014). Good taste also conveys the spirit of the book and brings comfort and pleasure to readers.

Realization of sensory interaction in bookbinding design

Book design is a process of seamless integration of art and technology, and every link is inseparable. Personalized processing of materials, clear text transmission, special selection of paper, awareness of the technological process, and reasonable design of book shape are all tests for designers. Books are different from art paintings. Its basic purpose is to let people read and transmit information, and the purpose of this kind of art is to let people “use.” This determines that the beauty of books needs to combine the beauty of appearance and practical beauty. In the process of reading, in order to enlarge the sensory feeling, we must use this series of materialization techniques to connect the content of a book with the full expression of emotion.

The most practical sensory reading experience is achieved through book materials. Different material contrasts, visual presentation effects, and visual texture effects are called materials, and different materials have a different esthetic feeling. Material is a special medium that affects the human senses (Silva and V. d. P. R 2004). Different from graphics and colors, the use of book design materials is gradually concerned with the esthetic demand of modern people, for books are no longer limited by the plane and static way. When designing books, materials communicate with readers directly through their own particularity (Mirabbasi et al. 2013). Different materials of soft, hard, rough, and delicate degree will give people different sensory feelings. Designers need to choose reasonable material content to attract readers.

In the process of designing books, designers need to have a deeper understanding and research on the nature of materials. According to the usual rules of book design, the use of modern materials improves people’s sense of book communication...
and enriches people’s impression of books. This kind of material can enhance the reader’s five senses experience based on its own particularity, arouse the internal familiar impression of the article, and make this impression permanent. This is something that cannot be replaced by other parts of e-books.

Characters are produced by ancient hieroglyphs. The writing in this period may not fully represent the birth of writing consciousness. It can only exist as a sign or a mark, and this kind of sign or mark is gradually split between people’s praise. People’s use and record make it gradually evolve into words. In book design, how to make readers understand the text is the key factor. Books are “castles” built on words. Even if the content of the book text and the font and size of the text cannot completely match, we should also choose the text that is most suitable for the most matching content (Mishra and Desai 2006).

In the process of book design, Chinese characteristics can be best reflected in Chinese characters. As the crystallization of Chinese ancestors’ wisdom, Chinese characters are closely related to our life. Every Chinese character contains many interesting pictographic structures. The pictographic nature of Chinese characters means that it not only reflects the shape of objects, but also reflects the meaning and sound of their existence. A word combined with other words will bring new meaning: different pronunciations and different meanings. It can be said that the world of Chinese characters is equivalent to a small universe. Some words form a sentence, other sentences are combined to form a poem, and then the poem is arranged as a poem in a continuous line, which can realize the beauty of artistic conception that cannot be expressed in other languages. Chinese characters are unique, which cannot be replaced by other characters. They can pay attention to some invisible natural effects, such as the germination of plants, the breeze, the rhythm of life, and the breeding of soil. They can be skillfully integrated into Chinese characters, so as to create a glyph form with life. Chinese characters and the life of nature are symbiotic. If you observe a Chinese character carefully, you can feel its overlapping, and you can feel the meaning and connotation of the text through spreading.

**Conclusion**

Based on the remote sensing image of L estuary and the hydrometeorological data of the main stream of L River in recent 30 years, this study analyzed the deposition and erosion.
characteristics of L estuary wetland beach in recent 30 years by using isotope identification technology and geographic information system and constructed the annual corresponding relationship between the beach deposition process and L river runoff, as well as the conditions controlling the driving dynamics between hydrodynamic forces and fine material deposition and the temporary response sediment and sediment flow between L river sediments. Finally, this paper investigates the bookbinding of the city library. Under the environment of immersion reading, we can use five senses to understand the connotation of books, which will add new impetus to book design, enrich the sensory experience brought by traditional books, and realize multidimensional reading, so as to make it more valuable and make the transmission of information more efficient and let readers feel the power of design and get a better reading environment. In the new media era, the design of books will continue to evolve and be full of vitality. It will continue to bear the important responsibility of recording human civilization and become the eternal spiritual wealth of mankind. In order to make books more causal, find out the reason for the plot design and understand the relationship between human and book emotion and space. This paper changes the traditional way of book design, endows books with new meaning, and makes the process of book design more flexible.

Declarations

Conflict of interest  The authors declare that they have no competing interests.

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