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Exploration of Chinese Opera Exhibition Space

Taking Kunshan Baixi
Museum as an Example

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ABSTRACT

This paper investigates a variety of digital exhibition technologies and cases to prove that digital exhibition methods have great advantages in displaying non-material exhibition objects. The use of digital exhibition methods in the space of the Chinese Opera Culture Museum can arouse the audience's curiosity and desire to explore; expand the boundaries of information, and feedback information to the audience in real time; and combine virtual reality to bring the audience closer to the opera performance itself.

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INTRODUCTION

With the development of computer technology, more and more technologies based on graphic algorithms and somatosensory interaction are applied in the exhibition space. To increase the fun and enhance the sense of immersion, the modern museum uses a variety of display methods combined with digital technologies. The Chinese Opera Museum is particularly unique in the museum. As the quintessence of Chinese culture, the art of Chinese Opera is of great value in protection, research, and inheritance. The museum should undertake the important task of spreading and promoting the culture of Chinese Opera to the public. At the same time, as an intangible cultural heritage, the display of opera culture in museums should consider its intangibility and present it in combination with special means such as digital exhibition methods or performances.

The research takes the exhibition space of the Chinese Opera Museum as the object, and through the investigation of the domestic opera art museums, understands the main exhibition methods and display methods of the current Chinese Opera Museum, focuses on the application of digital exhibition methods, and summarizes and analyzes the current Chinese Opera Museum exhibitions. Summarizes and analyzes the deficiencies of the current opera museum exhibitions and puts forward the necessity of integrating digital display methods into the exhibition space of opera culture.

This paper also investigates a variety of digital exhibition technologies and combines actual cases to prove that digital exhibition methods have great advantages in displaying non-material exhibition objects. The use of digital exhibition methods in the space of the Chinese Opera Culture Museum can arouse the audience's curiosity and desire to explore; expand the boundaries of information, and feedback information to the audience in real time; and combine virtual reality to bring the audience closer to the opera performance itself.

Finally, the research summarizes the advantages and principles of using digital exhibition technology in opera exhibition space. Based on the results of this research, a feasible design is made for multiple exhibition spaces of Kunshan Chinese Opera Museum.

METHODOLOGY

1) Survey method

In this study, the survey method was used. After careful selection of the research objects, through on-the-spot investigations into the local opera museums, we learned about the current situation of the exhibition design of the opera museums, mastered the first-hand image data, and intuitively discovered the problems. During the research process, we also communicated and established contacts with the staff in the research museum, paving the way for more research in the future.

2) Literature analysis

The research also uses the literature analysis method, through a large number of reading related literatures on the digital display space of the Xiqu Museum, sorting out the relevant materials, understanding the current situation of the related research on the digital opera museum, and further researching this topic based on the existing achievements of others.

3) Case analysis

In addition, this paper also uses the case analysis method to find and analyze the cases of applying digital technology in opera art exhibitions and opera performances, so as to provide strong practical case support for the theory of this paper. Summarize the principles and design methods of digital display in Xiqu Art Museum through case studies, and draw research conclusions.

KEYWORDS

1) Chinese Opera Museum

In China, museums are divided into four types, **Art, History, Science and Technology**, and **Comprehensive**. The Chinese Opera Museum belongs to art museum, which is used for the exhibition, protection, storage, dissemination and promotion of the culture of Chinese opera. Chinese Opera museums in various places often display the history, characters, and objects of opera performance with regional characteristics and themes.

2) Kunqu

Kunqu (Chinese: 昆曲), also known as **Kunju (昆剧)**, **K'un-ch'ü**, **Kun opera** or **Kunqu Opera**, is one of the oldest extant forms of Chinese opera. It evolved from the local melody of Kunshan and later came to dominate Chinese theater from the 16th to the 18th centuries. The style originated in the Wu cultural area. It has been listed as one of the Masterpieces of the Oral and Intangible Heritage of Humanity by UNESCO since 2001.

3) Display and Exhibition Space

Display, the logical order of **material or non-material content** is organized and presented in front of the audience. The exhibition space of Chinese Opera Museum refers to the place where the art of Chinese opera or a specific type of Chinese opera is the core to display relevant materials. Most of the exhibits include opera relics such as opera costumes, musical instruments, opera scores, and stages, as well as pictures and text introductions on the history of opera. In addition, opera performances and videos of performances are also part of the opera art exhibition.

01

RESEARCH ON THE EXHIBITION SPACE OF THE CHINESE OPERA MUSEUM

The significance of the research on the exhibition space of the Opera Museum is to understand the **current situation and problems** of the entire exhibition space of the Opera Museum by investigating some museums.



RESEARCH

In order to make the conclusions more credible and universal, there are multiple considerations when selecting the research objects. The author has compiled a list of key domestic opera museums as follows, and selected 4 opera museums for research. First of all, the diversity of operas is considered in terms of the theme of opera. First of all, Kunqu Opera, the mother of all operas, is selected. It also selects Huangmei Opera, which is widely heard in modern times, and Cantonese Opera, which is only sung in some areas. Secondly, considering the scale of the Opera Museum, the Cantonese Opera Art Museum with an area of 17,200 square meters and a construction area of more than 20,000 square meters was selected, and the Huangmei Opera Exhibition Hall of the Anqing Museum, which was relatively small, was also selected. Since the 1980s, the construction of Chinese museums has considered the old and new museums in terms of time. For the new museum, the Cantonese Opera Art Museum, which was opened to the public and put into use in 2016, was also investigated. I want to select research objects from different dimensions and hope to get a glimpse of the current situation of opera museums. The following is the introduction of each museum under investigation.

Museum	Opening Date	Theme	Location
Beijing Opera Museum	1997	Peking Opera	Beijing
Suzhou Opera Museum	1986	Kunqu	Suzhou, Jiangsu
Chinese Opera Museum		Comprehensive	Fuzhou, Jiangxi
Tianjin Opera Museum	1986	Tianjin Opera	Tianjin
Opera Museum in Shanxi Normal University	1984	Comprehensive	Taiyuan, Shanxi
Shanghai Theater Academy Museum of traditional Chinese Opera		Comprehensive	Shanghai
Yue Opera Museum	1990	Yue Opera	Shengzhou, Zhejiang
Nanjing Yue Opera Museum		Yue Opera	Nanjing, Jiangsu
Kaifeng Yu Opera Museum		Yu Opera	Kaifeng, Henan
Chinese Ping Opera Museum		Ping Opera	Tangshan, Hebei
Chuan Opera Museum	2001	Chuan Opera	Chengsu, Sichuan
Cantonese Opera Art Museum	2016	Cantonese Opera	Guangzhou, Guangdong

Form 2.1 Major opera museums in China

CHINA KUNQU OPERA MUSEUM

The predecessor of the China Kunqu Opera Museum is the Suzhou Opera Museum. It is located in Suzhou, the birthplace of Kunqu Opera. It was established on the basis of the Qianjin Guild Hall. The building of the museum follows the site of the Qianjin Guild Hall built in the Qianlong period of the Qing Dynasty. The museum revolves around Kunqu Opera genres and displays Kunqu Opera costumes, musical instruments, books, history and important figures.

The museum consists of five parts, namely the Kunshi Hall, the Flower Basket Hall, the Ma De Kunqu Opera and Painting Art Hall, the Kunqu Opera Exhibition Hall of "Communication with the Ancients", the main hall stage and the ancient stage.

The Kunqu Opera History Exhibition Hall shows the long development of Kunqu Opera with the clues of Kunqu Opera figures, Kunqu Opera works, and Kunqu Opera time. In the exhibition hall, there is a hall named **Baohetang, the treasure of the town hall (Figure 2.1)**. The exhibition hall of works is located in the northwest corner of the Kunqu Opera Museum of China. The exhibition hall displays historical objects such as lithographs, woodcuts, and manuscripts, which are of great research and ornamental value.

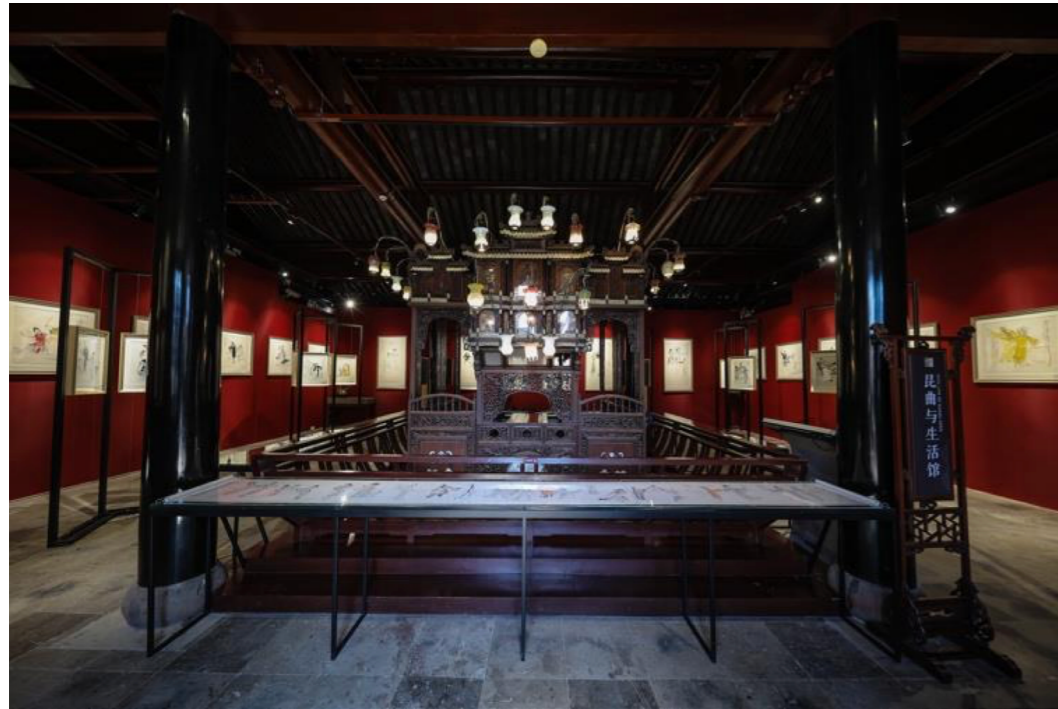


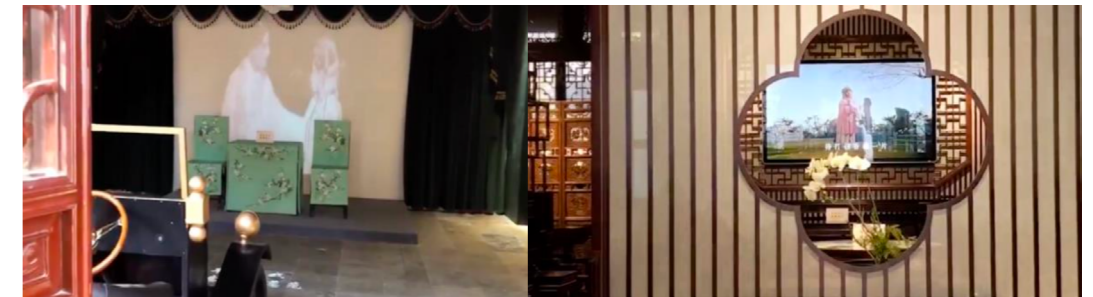
Figure 2.1
Baohetang, the
treasure of the
town hall

In the Kunqu Opera Museum of China, there are exhibitions and introductions of historical objects at the material level, as well as the performance and dissemination of the classic repertoires at the non-material level. In the Kunqu

Opera History Exhibition Hall, the famous Kunqu Opera figures and classic Kunqu Opera works in history are presented in the form of pictures, texts and video materials displayed on the electronic screen. In the exhibition hall, rest facilities are placed in front of the TV for visitors to stay for a long time to watch Kunqu Opera works.



Inside the Kunqu Opera
Museum of China



Video playback area

ANQING MUSEUM HUANGMEI OPERA EXHIBITION HALL

Anqing Museum is located in Anqing Economic and Technological Development Zone. The museum includes Anqing calligraphy and painting, coins made in Anqing, and changes in Anqing city. The Huangmei Opera exhibition hall is located on the third floor of the museum. The exhibition hall is interesting, interactive and experiential. The exhibition hall does not use the ancient architectural style, but on the basis of the modern museum, uses Chinese patterns and materials to decorate the details, making the whole exhibition hall generous and orderly with a modern sense. The exhibition hall is a single streamline, which consists of several sequential modules connected in series, namely "The Cradle of Opera", "Huiban Entering Beijing", "Huangmei Blooming", "Hundred Flowers Blooming", and "Mei Yun Inheritance". After some historical objects and materials, I also have an understanding of the past and present of Huangmei Opera art.

The glass showcase lists Huangmei Opera-related items including costumes, props, sets, scripts, manuscripts, and villains. There are rich texts explaining relevant information on the exhibition wall. An interactive display screen was set up in the "Inheritance of Mei Yun" section of the exhibition to show the performance images of Master Han Zaifen.



Figure 2.1
Han Zaifen interaction
screen installation,
Anqing Museum
Huangmei Opera
Exhibition Hall

In order to increase the connection between historical data and opera, there are touch screens and earphones under the two exhibition walls as an extension of the content of the exhibition walls. Viewers can listen to the corresponding opera excerpts by clicking on the illustrations about the plot on the screen.

A miniature virtual booth is set up in the center of the exhibition hall. The booth is about 4 meters long and 0.8 meters high. It uses real sets and holographic projections of characters to display the classic arias of Huangmei Opera, which can be enjoyed by more than ten people standing together.

CANTONESE OPERA ART MUSEUM

The Cantonese Opera Art Museum is located in Liwan District, Guangzhou City, covering an area of more than 17,000 square meters. The overall museum is divided into two areas: the south bank and the north bank. The south bank is the main exhibition area, exhibition halls, and gardens, and the north bank has auxiliary facilities for Cantonese opera research. The overall architectural style is mainly based on the ancient gardens of Lingnan style. In the courtyard, there is a waterfront stage with a wooden structure. The architectural details are decorated with exquisite stone carvings and wood carvings, which have unique artistic value.

Cantonese opera is widely circulated in Guangxi, Guangdong, Hong Kong and Macao, and has been rated as a representative work of the intangible cultural heritage of mankind by the state. The Cantonese Opera Art Museum conducts exhibitions, stage performances, education and popularization activities around this genre. The exhibits are diverse, and the historical changes, artistic features, classic repertoires, Cantonese opera masters, etc. In addition to the traditional display form, the exhibition also uses digital means, integrating interactive somatosensory devices and digital media equipment touch screens into the exhibition hall.

In 2019, the Cantonese Opera Art Museum proposed the development plan of "building a digital museum platform", strengthening the construction of cloud museums, and building a museum virtual platform to realize online and offline data sharing. The exhibition combines offline exhibitions and online exhibitions. People can "view the exhibition in the cloud" on the official website and browse the exhibits on the website as if they were on the scene.

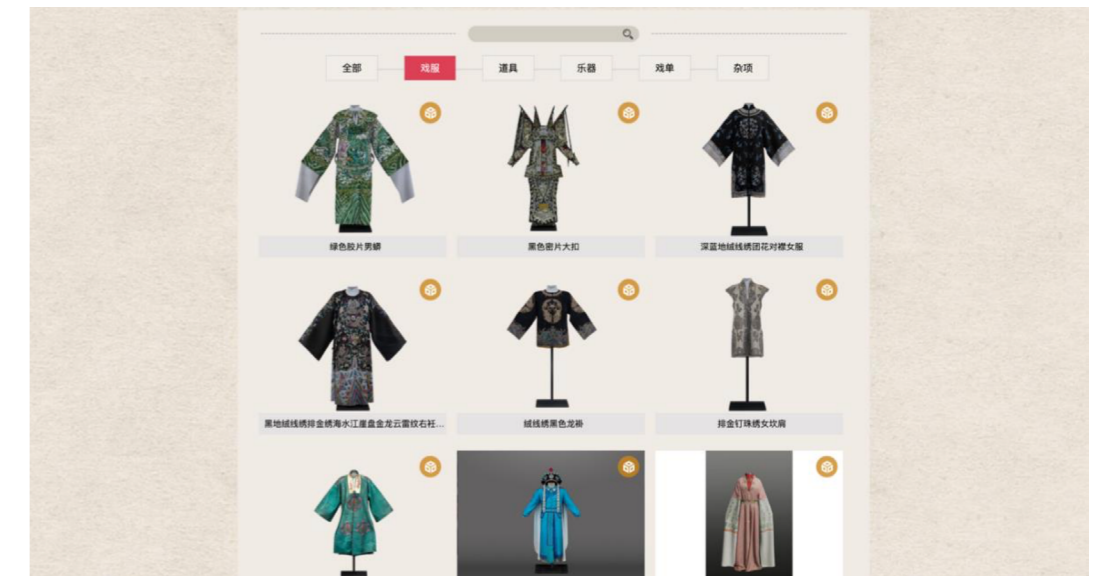


Figure 2.1
The "Digital Museum"
section of the official
website of Cantonese
Opera Art

TIANJIN THEATER MUSEUM

The Tianjin Theatre Museum has a long history and was founded in the Guangxu period of the Qing Dynasty. After overhaul in 1985, the country's first thematic museum was built. The building of Tianjin Theatre Museum is Tianjin Guangdong Guild Hall, with a construction area of more than 2,300 square meters. The museum uses a courtyard to connect the ancient theater, the Baishitang and other places. Its architectural appearance combines the characteristics of North and South my country, with blue bricks and black tiles.



Tianjin Theatre
Museum Siheyuan



Showcase of Tianjin
Theater Museum

In the square and side rooms of the courtyard house, there are permanent displays of historical materials of Tianjin Opera. Tianjin opera is compatible with north and south styles. It originated from Kunqiang and leather spring in the Ming and Qing dynasties, and is integrated into local songs and tunes to form a unique Tianjin opera. The exhibition introduces the rise and fall of Tianjin opera.

On the wall of the entrance hall of the Opera Museum, there are four pictures printed on the Eastern Han Dynasty's "Hundred Operas of Music and Dance", "Southern Zhongfan Paintings", Yuan Zaju Murals and Qing Dynasty "Southern Tour Map", which show the appearance of watching operas in various periods of ancient times.

The most famous is the theater building. The theater has a large space span and can accommodate more than 800 people. The stage is an all-wood structure, and the outside is not supported by pillars, and there are no pillars in the entire space, which minimizes the obstruction of the sight of the audience on all sides and refreshes the theater-watching experience. The painted wood carvings are beautifully decorated, and there is a structural caisson on the top for natural sound amplification. All perform here.



The stage in the theater
building of Tianjin
Theater Museum

SUMMARY OF THE PROBLEMS

It can be seen from the survey that the museum exhibition spaces of each type of opera take into account the material and non-material parts of the opera exhibition. Most museums have digital display methods to present the content of opera performances in the form of images; museums focus on viewing exhibitions Experience, organize historical relics and materials, and use reasonable logic to display the historical materials of opera culture. However, there is still room for improvement in the Chinese Opera Museum. In general, there are the following common problems.

1) There are many museums of a single genre

The development of opera along the way is a process of constantly absorbing and integrating local culture. In the process of building local opera art museums, localities often focus on the themes of local opera genres. collect. However, opera genres are related to each other, and a museum of a single opera genre has no horizontal comparison between opera genres and no concept of evolution between opera genres, so it is impossible for the audience to establish a general understanding of Chinese opera culture.

2) Lack of cultural context of objects

In the opera museums surveyed above, without exception, the exhibition halls display the style of opera with historical relics as the core. However, apart from the ornamental value of cultural relics, their use, creation environment, and historical significance are only explained to the audience through a small amount of text introduction, and it is impossible to understand the meaning of these objects based on the relevant opera. The contradiction lies in the short viewing time of each exhibit and the deep cultural connotation of the exhibits - the viewer cannot establish a cognition of the related repertoire and its cultural context within a limited time.

For example, in the Huangmei Opera exhibition hall, only headdresses are simply listed. Among them, the phoenix crowns on display are intricate. Birds, dragons and phoenixes, and jewelry decorations can show the prominence of the owner. Butterfly phoenix crowns and nine phoenix crowns are suitable for characters of different identities. The set of wings is another kind of headdress, which is used in more daily occasions than the phoenix crown. For example, the queen in "The Golden Branch" wears the phoenix crown, and the concubine Li Yan in "Second Entering the Palace" lives in the harem, and the headdress is the set of wings. Such opera costumes are closely related to the manifestation of their roles in different environments, and only knowing such a context can truly approach the art of opera itself.



Antique architectural style roof

3) Antique architectural STYLE is still the mainstream

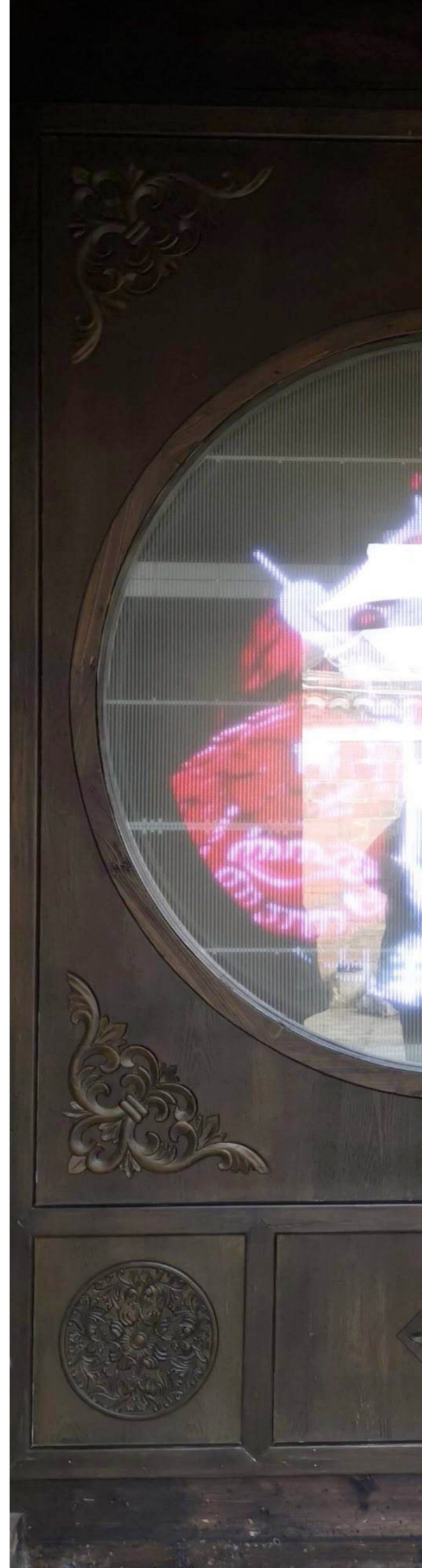
Most of the opera museums have the same style as Chinese antique buildings, and the materials, window lattices, furniture, lamps, etc. of the interior design of the buildings are often directly adapted from the Chinese ancient architectural style. The China Kunqu Opera Museum is built on the foundation of the Qianjin Guild Hall. It is an ancient wooden house with sloping roofs, beams and columns and plaques; the Huangmei Opera Museum uses Hui-style white walls, black tiles and wooden grilles to create an ancient flavor in the south of the Yangtze River. Everywhere reflects the taste of south China.

The author believes that it is not necessary to insist on pursuing the so-called immersive experience of antique everywhere in design, for three reasons. First, most antique architectural forms are only a decorative effect, and their own architectural decoration value cannot echo the theme of the museum, which is of little significance; second, the combination of "ancient" and opera culture will easily deepen the distance between the audience and the art of opera. Third, interactive display technology, as an indispensable exhibition method, expands the content of the exhibition and adds video information, which is extremely important for the interpretation and dissemination of opera culture, but interactive display technology intervenes in antiques After the building, it broke the "immersion" that I wanted to create, which was abrupt and out of place.

02

DIGITAL DISPLAY TECHNOLOGY AND APPLICATION

Digitization integrates various information technologies into exhibitions. Compared with the traditional exhibition space, the digital exhibition space puts people's **experience** first. The traditional exhibition space transmits information to the audience in one direction, and the audience, as the receiver of the information, cannot give feedback to the space. The digital exhibition space creates a variety of exhibition experiences for the audience - the screen expands the amount of information in the exhibition and creates more possibilities; the somatosensory installation allows the audience to interact with the environment and enhance the sense of experience; virtual reality depicts the scene and makes people immersive realm; holographic projection turns the ethereal into reality. A variety of technologies have transformed the exhibition space. Investigating various cutting-edge digital exhibition technologies and being familiar with the materials and their working principles will enable us to make better use of technologies to design exhibition spaces that fit the theme of the exhibition.



INTRODUCTION OF DIGITAL EXHIBITION TECHNOLOGY

PROJECTION TECHNOLOGY

Projection technology is divided into holographic projection technology, screen projection technology, phantom imaging technology and so on.

Holographic projection technology uses the principle of light interference and diffraction to project images in space that can be observed in multiple directions. In museum exhibitions, it is mostly used to display virtual items, present three-dimensional exhibits from multiple angles, and present enlarged exhibit details.

Phantom imaging technology is used in stage art to enrich the details of stage art, create scenes, etc. Its realization relies on the projection film. Projection film is divided into many kinds according to the material process, such as holographic projection film; gray projection film with holographic color filter crystal (HCFC) as the core material; mirror projection film with SI optical structure; the main component is aerospace photosensitive material (SOB) phantom imaging film, etc. The thickness and weight of different film structures are different, and the light transmittance and projection effect are also different. The membrane structure does not block the normal performance of the actors on the stage, and can also present a multi-layered and ever-changing scene on the stage by projecting images.

For example, the stage play "The Cowherd and Weaver Girl" staged at Huangmei Drama Theater in Anhui Province uses phantom imaging technology to project mountains, rocks, trees, pavilions and other objects on the holographic film, showing complex scenes, saving the cost of props, and harvesting a variety of stage effects. .



Holographic projection technology on stage

AUGMENTED REALITY TECHNOLOGY

Augmented reality is also called mixed reality or augmented reality. It presents virtual images by computing based on real scenes, combines computer graphics technology, computer visual art, human-computer interaction art, etc., and creates a new visual environment by combining reality and virtuality. There are three characteristics of augmented reality. First, the real environment and the virtual environment are closely combined, and the audience can have the feeling that the virtual and the real go hand in hand. Second, the virtual content and the real content are highly compatible. The third is immediacy, the virtual content also changes when the reality changes, and the human-computer interaction extends to the interaction between people and space.

Interaction is immediacy, and human-computer interaction will rise to the exchange of information between people and space - people can affect the space environment, and the space environment will also bring people a new experience.



Human-Computer Interaction in Augmented Reality

AUGMENTED SOMATOSENSORY DEVICE AND INTERACTIVE SPACE REALITY TECHNOLOGY

The somatosensory device uses real-time dynamic capture, combined with image recognition, voice input, etc., to enable people to interact with machines through actions. The feature of somatosensory device is that the influence of space on people directly acts on the human body, mobilizing vision, hearing and perception, so that people can obtain a comprehensive comprehensive experience.

The Hong Kong Cantonese Opera Heritage Research Centre has developed the "Cantonese Opera Body Evaluation Research System", which aims to help Cantonese opera beginners learn Cantonese opera body movements, etc. First, according to the camera's "perception" of the beginner's movement, and compared with the standard movement in the recorded expert video, then give a score or detailed evaluation of the specific movement.



Cantonese Opera Body Movement Evaluation Research System

APPLICATION ADVANTAGES OF DIGITAL EXHIBITION TECHNOLOGY

1) Multidimensional presentation

With the help of space technology, the exhibits can change from the influence of plane on the audience's vision to the influence of multi-dimensional on the audience. Multi-dimensional means that the exhibits affect the audience's psychology and feeling. In the Science and Technology Museum, many exhibits convey scientific truth through the phenomena that occur after interacting with people. For example, the demonstration of the human digestive system in the China Science and Technology Museum is to simulate the "processing" of food through the organs through digital technology combined with human models. A series of processes of digestion and absorption. This fundamentally reshapes the way of information transmission in museum space, and the one-way input of information received by audiences in traditional museums is transformed into selective reception of information. The audience has become an indispensable part of the so-called "display", and it is only because of the audience's participation that the entire process of information transmission is completed.

2) Reproducing the scene

Digital technology can build environments with light and shadow, simulate environments, and create immersive experiences. The core of immersion lies in "flow". People are in a certain simulated environment, and their minds are completely concentrated, resulting in an immersive feeling.

In the opera museum space, classic performance fragments are often reproduced by reproducing scenes. Anqing Museum's Huangmei Theater has a virtual stage, and a huge screen is placed in the center of the stage. There are 1:1 characters performing operas on the screen. People sit under the stage as if they were watching the live performances of that year. Such a display method can make people deeply impressed by the content of the exhibition, and at the same time generate strong personal emotions during the experience.

3) Enhance the fun

The interactive installation adds interest to the exhibits and arouses the audience's desire to explore. According to the questionnaires distributed, 62% of the respondents knew nothing about the art of opera before entering the museum. The vast majority of the respondents believed that the reason they did not understand the art of opera was because of its profound knowledge and obscurity. The ancient architectural style of the traditional opera art museum is a little dull, and the various texts and historical materials are in a single form and lack interest. The addition of somatosensory devices and interactive spaces diversifies the exhibition space, mobilizes people's desire for knowledge and exploration, and allows people to acquire knowledge subtly in the process of interacting with machines.

03

DIGITAL DISPLAY SPACE DESIGN PRINCIPLES AND METHODS

On the basis of investigating opera art museums and understanding the cutting-edge digital exhibition technology, according to the characteristics of digital exhibition technology, combined with the particularity of opera art, the design principles and design methods of opera digital exhibition space are put forward.



DESIGN PRINCIPLES

1) Familiar with technical means

Digital technology often involves a variety of complex computer technologies and hardware equipment, which is a non-professional field for designers. In the design process, it often requires the collaboration of multiple types of work or the designers are familiar with technical details. In order to better design works that fit the theme, designers need to be familiar with the technical principles, working scenarios, and material properties of digital technology, in order to know the boundaries of digital art and make technology truly usable for me.

Digital technology relies on the development of computer technology. Computer technology is changing with each passing day, and new technological means emerge in an endless stream all the time reshaping the form of digital art and expanding the possibility of digital art. Innovation is the only way to maintain the vitality of design. While familiar with technical means, we should also pay attention to the latest development of technology, and carry out artistic creation on the basis of the latest technology.

2) Unification of content and form

When designing a digital exhibition space, the unity of content and form should be emphasized, and the design ideas should be changed according to different actual exhibition contents. For example, when popularizing opera actors walking on the stage, the footprints of the actors can be projected on the ground, and with the somatosensory device, visitors can walk according to the trajectory so as to experience the knowledge of the stage's steps. In this way, the audience can experience and actually feel the effect of the actors walking on the stage on the space division and the plot promotion, and the actions that take place in the space finally return to the space. The design of the exhibition space should closely link the form with the content, and express the theme in a suitable way.

3) Moderation

The application of digital means in the exhibition space of the opera art museum should follow the moderation principle.

The core of the museum is the exhibits. The exhibits are the relics of history. They carry the history and are a bridge between the present and the past. At the same time, the exhibits are also real "things". Things are the best evidence of what happened in history. In the current information age, the value of things is infinite. Objects are tactile and palpable, with materials, textures, touches and even smells that cannot be reproduced using current digital means.

The focus of the exhibition should be on the exhibits, and digital means are only auxiliary means, designed to better display the exhibits, and cannot put the cart before the horse. Now the so-called "immersive" and "Internet celebrity check-in" experience is popular on the Internet, so that the "experience" exists apart from the theme of the exhibition.

DESIGN METHODS

1) Deduce the sense of space

The art of opera is immaterial art, and all introductions to the art of opera must ultimately fall on the performance of opera. Most museums display operas through video materials, which transform an action that takes place in space into a two-dimensional picture, and the audience loses their perception of space when watching. For example, the action of throwing water sleeves conveys the emotions of the characters, which is full of changes in space; the spatial relationship between the characters on the stage when the actors step on the stage also helps the audience understand the opera. These lose their original charm when converted into flat images. At the same time, some museums will arrange offline performances of operas, but the number and breadth of performances will be limited, and visitors may not have the opportunity to watch the performances on the way to the museum. Holographic imaging technology allows viewers to observe exhibits from different angles, presenting a sense of space in front of them. The recorded plays are displayed in the space, so that many classic opera repertoires can be presented to the audience instantly and completely. Through the audience's multi-view holographic projection, a complete opera stage experience can be established in any occasion.

2) Real-time augmented reality information boundary

Augmented reality can combine the space where the viewer is located, combine reality and virtuality, and expand the information capacity of reality. In the process of watching Chinese operas, due to the local pronunciation of language and singing, the current audience cannot understand it, which hinders the audience's understanding of the plot. The general solution is often found in the teleprompter on the right screen in the theater. In an opera performance, the teleprompter will display the Italian and its translation to help the audience understand the plot, but the audience's eyes need to cross the stage and the teleprompter. On the board, this will undoubtedly have an impact on the audience's appreciation of the performance. Based on the immediacy characteristics of augmented reality technology, the lyrics are displayed beside the characters, which solves the trouble of the audience caused by not understanding the dialect, and can also maintain the audience's attention on the actors.

In addition, augmented reality technology can supplement the contextual background related to the displayed cultural relics in the limited exhibition space of the museum. For example, the Huangmei Opera Exhibition Hall of the Anqing Museum displays a variety of headgear. When the audience does not understand Huangmei Opera, it is difficult for the viewer to understand the difference between the many phoenix crowns and the meanings they represent in the works. Augmented reality technology can supplement relevant information, such as the presentation of images of the original works, so that the audience can have a deeper understanding of the exhibits.



Opera performance and teleprompter on stage

04

SCHEME OF KUNSHAN BAIXI MUSEUM ARCHITECTURE AND INTERIOR



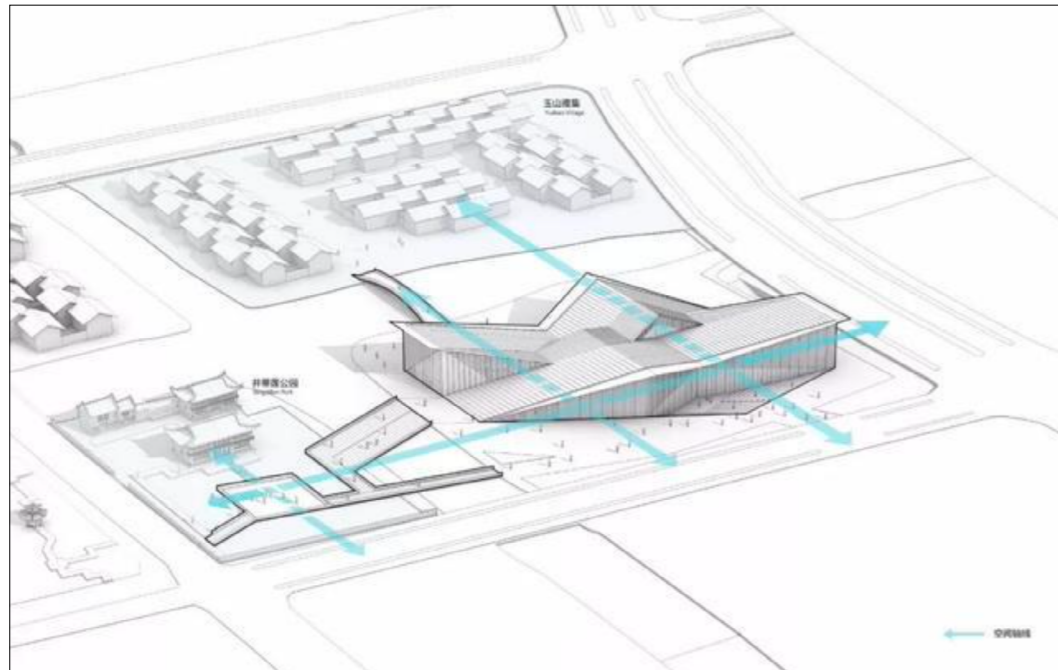
SITE OVERVIEW

"Kunshan Baixi Museum" is located in Kunshan City, Jiangsu Province. It will be completed in 2022 and is designed by Zhang Lei. The design of Kunshan Baixi Museum pays attention to the integrity of the environment and the driving effect on the surrounding area, and radiates the influence of the main building to the surrounding park green space and residential land, which greatly mobilizes the enthusiasm of citizens to participate.

The main body of the building is two symmetrically arranged slope-shaped blocks, which are used to simulate the rolling hills of the southern water town.

The exhibition hall includes permanent exhibition halls, special exhibition halls, cultural and creative spaces, conservation research centers, etc., providing visitors with a variety of opera art experiences.

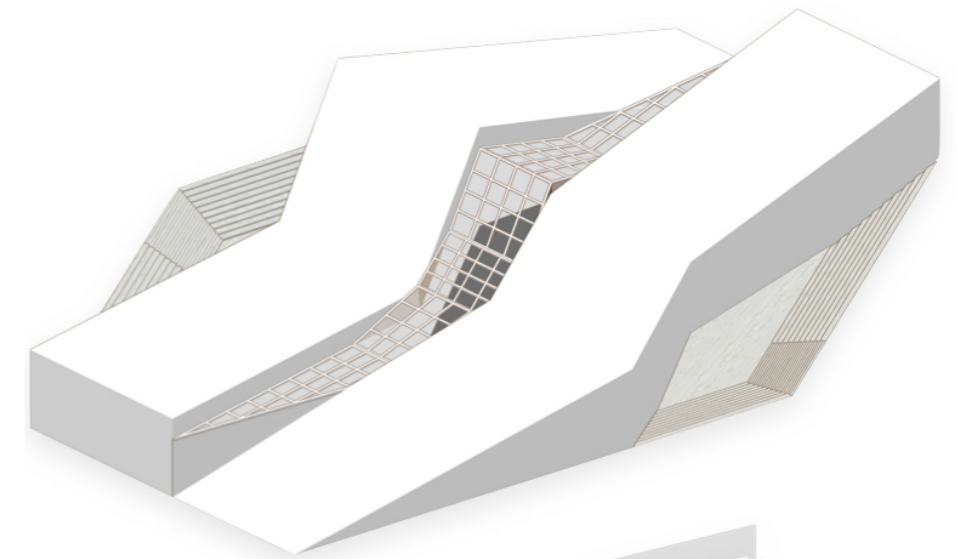
This design takes the design of the exhibition hall as the core, reasonably divides the interior space of the building, designs a variety of interactive installations that are both interesting and artistic, and integrates cutting-edge digital exhibition technology into the display of opera art.



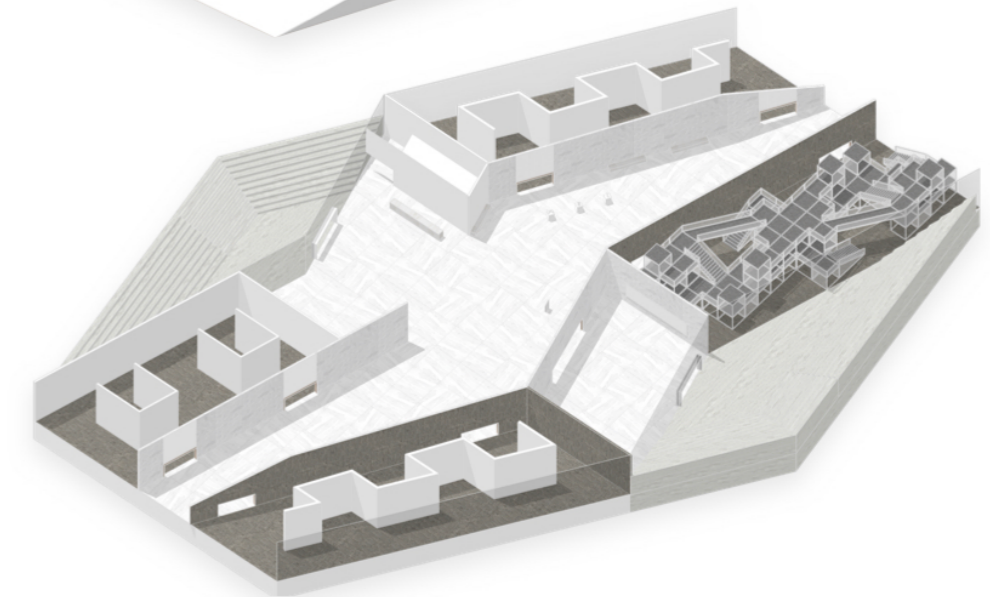
Schematic diagram of building circulation and structure

ARCHITECTURAL SPACE

As shown in the figure, the main part of the building is divided into upper and lower floors. Visitors first enter the building through the sinking entrance of the large steps on the west side. There are pairs of sunken steps on the east side, which can also lead to indoors and be used as an outdoor performance space. After entering the building, there is a high-ceilinged entrance hall on the left, and a space for cultural and creative products on the right. There is a consultation center in the entrance hall, which is spacious and convenient for exhibition and event release space layout. The exhibition halls on the first floor are distributed around, each exhibition hall has different themes, and there is no viewing order between the exhibition halls. There are two steps and elevator passages to the second floor in the north and south directions of the building. The second floor is surrounded by a plank road, connecting various exhibition halls and other facilities. The overall spatial streamline is relatively free and unconstrained.

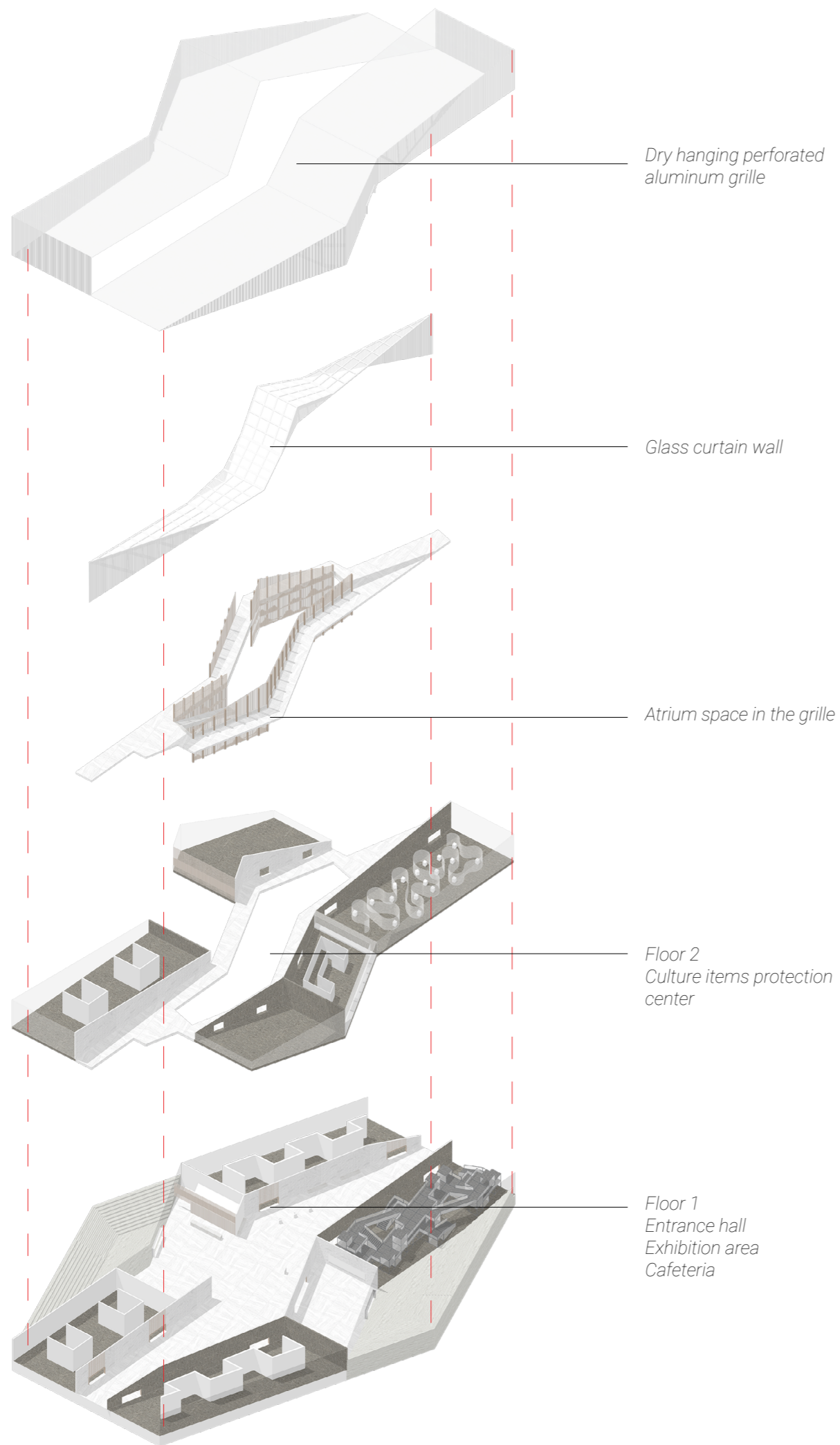


Roof & exterior



First floor





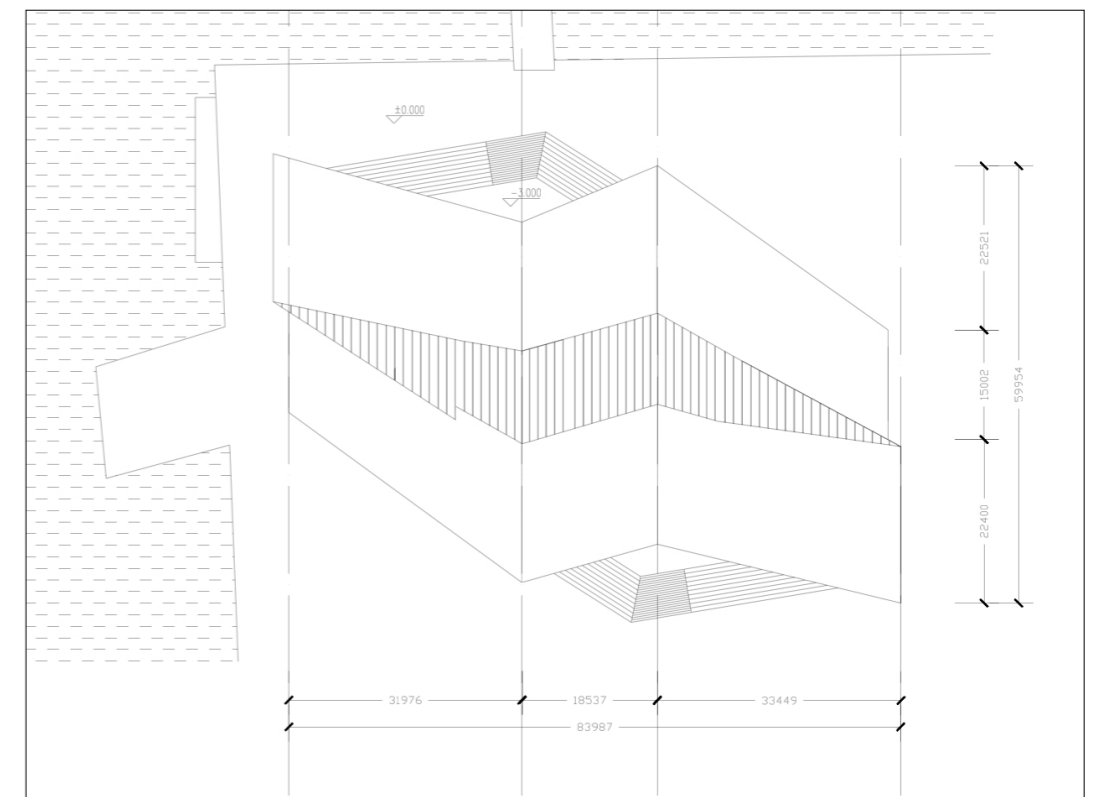
The design of the main exhibition hall is divided into three parts: **drama kaleidoscope, quyi stage and drama message board**

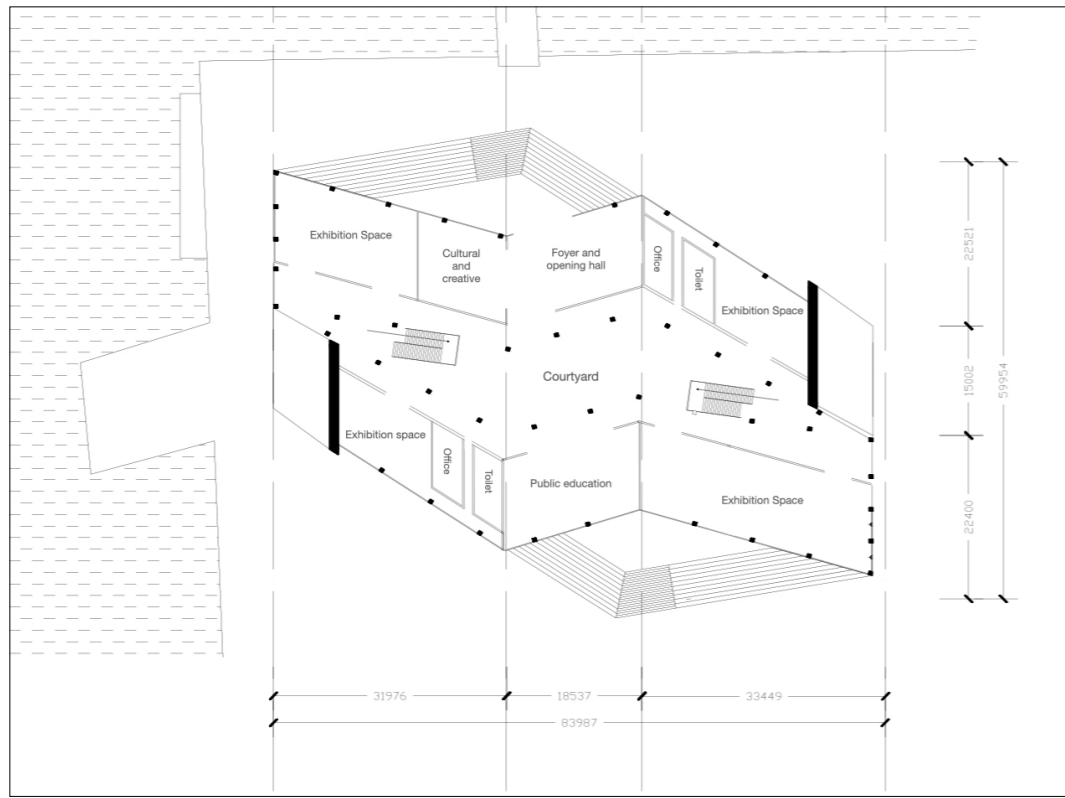
Don't arrange it in the first, middle and last three parts of the moving line. The designer wants the audience to experience the process of "traversing and viewing" - "in-depth exploration" - "discussion and sharing" of the art of opera.

The "Kaleidoscope of Chinese Opera" will display the operas that usually need to be watched at a specific place and time, so that

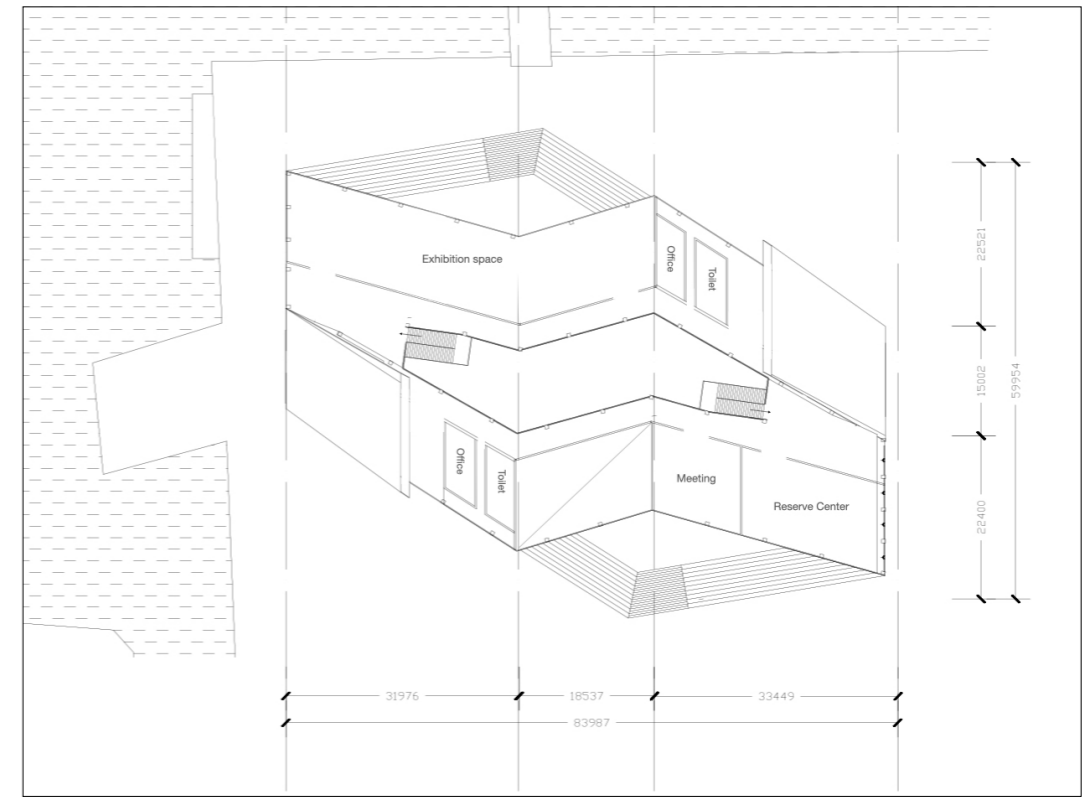
The viewers traverse and watch different operas horizontally, so that they have direct, real and perceptual contact with the art of opera, and build the viewers' curiosity and desire to explore. "Quyi Stage" allows the audience to learn more about the stories behind the art of opera, such as costumes and make-up, props, plot features, famous actors, etc. In the process of interacting with the screen, the audience will go deep into the ocean of opera art. "The Opera Message Board" makes it possible for opera lovers to have a dialogue that transcends time and space. Viewers can establish a long-term connection with the opera culture from the community.

Plan of the roof

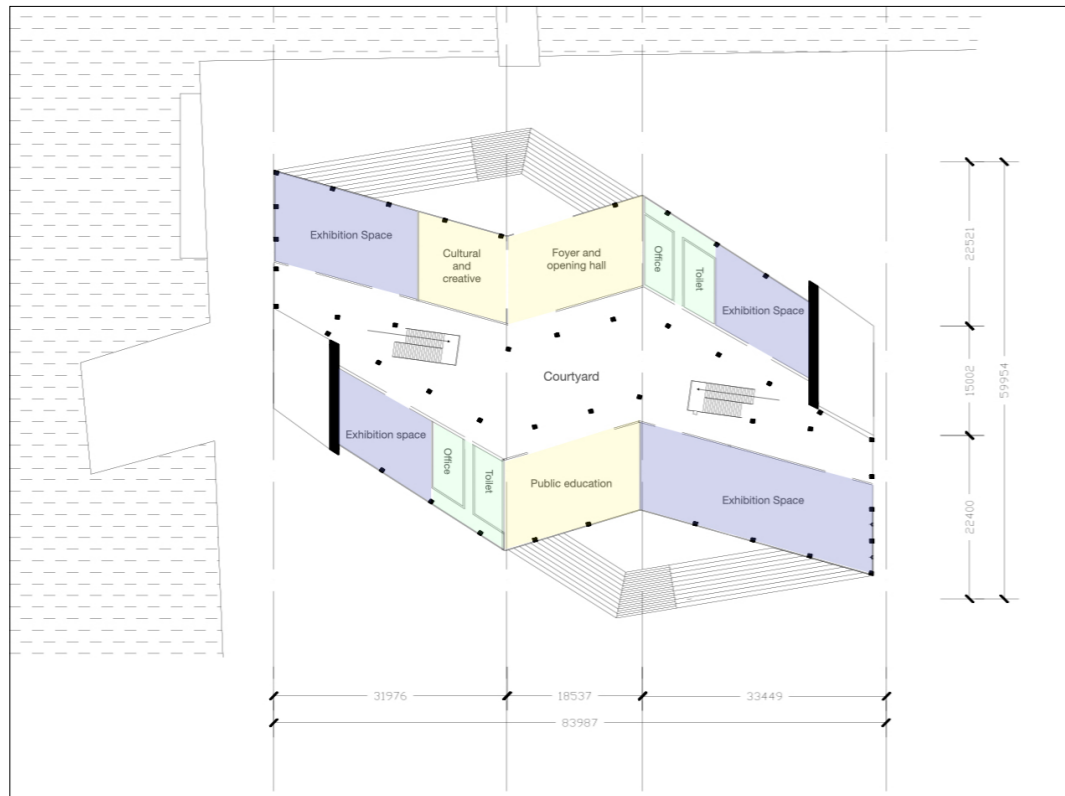




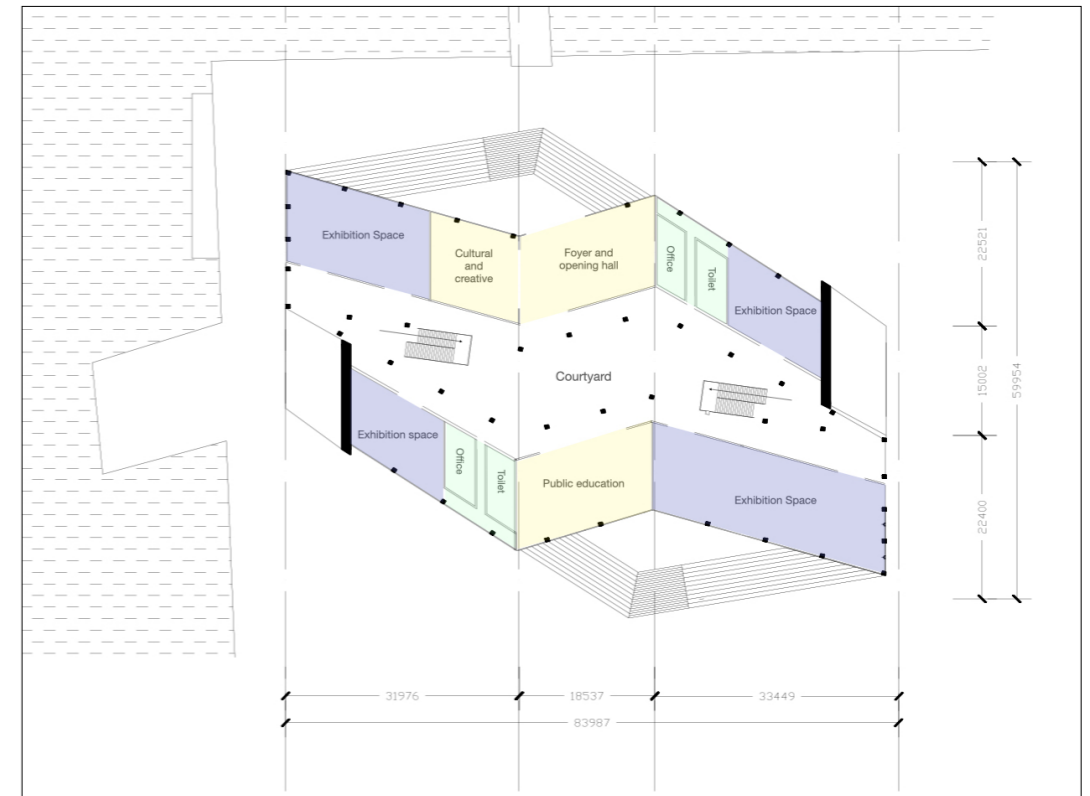
Plan of the first floor



Plan of the second floor



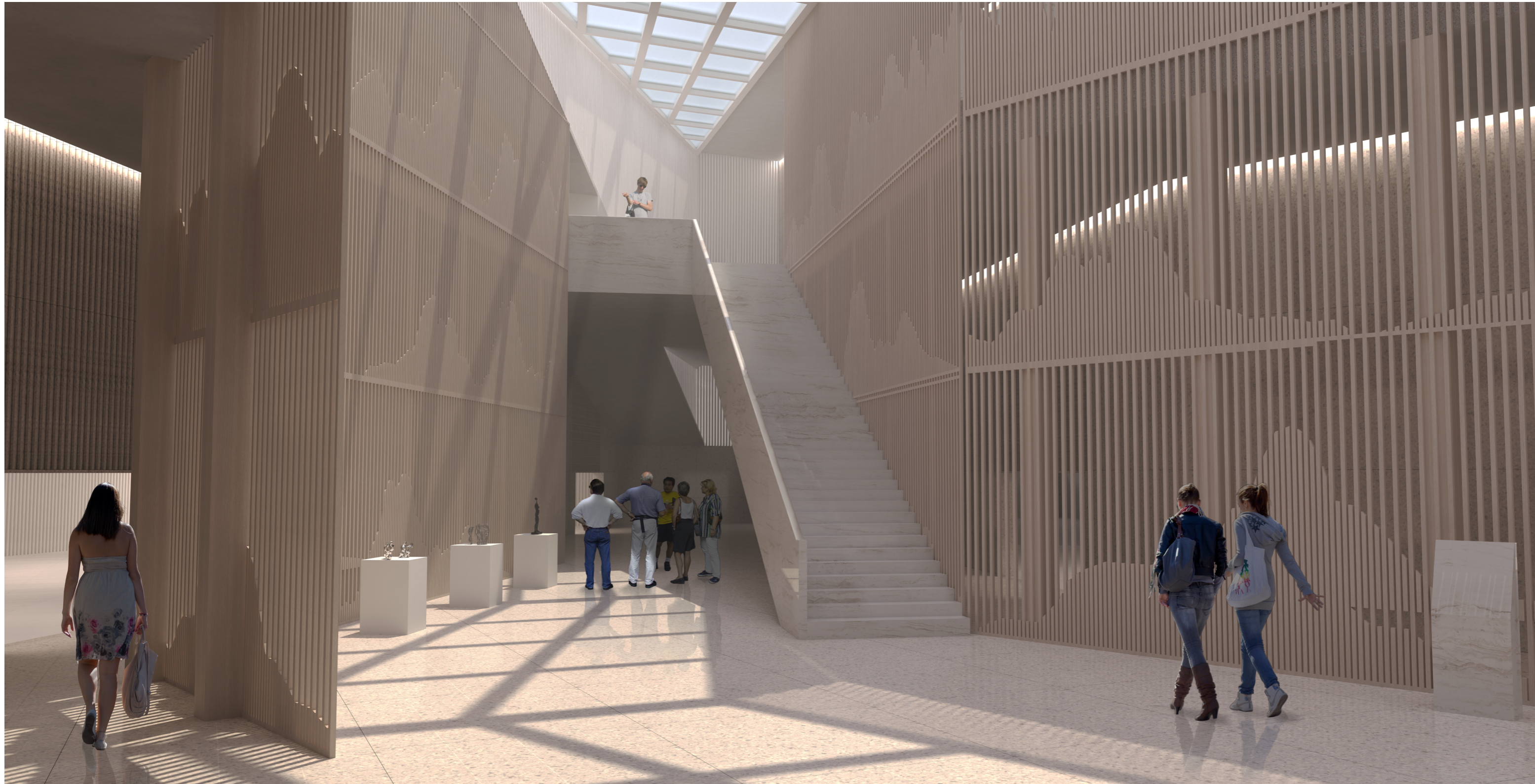
- Exhibition Space
- Public Space
- Facilities & Storage



- Exhibition Space
- Public Space
- Facilities & Storage

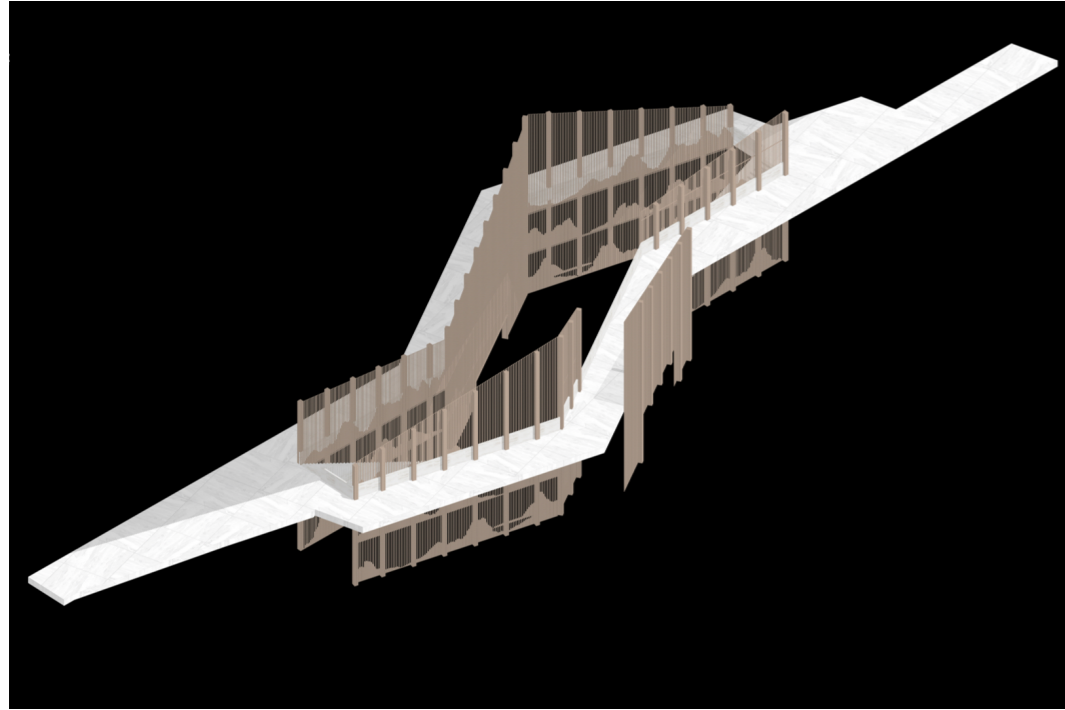
INTERIOR

The atrium is the entrance to the various exhibition spaces, where people can temporarily stop. The sloping transparent glass roof at the top allows sunlight to enter the space and fills the entire space with the transformation of light and shadow. It is surrounded by wooden grilles, showing the beauty of traditional Chinese cultural elements.



WOODEN GRILLES

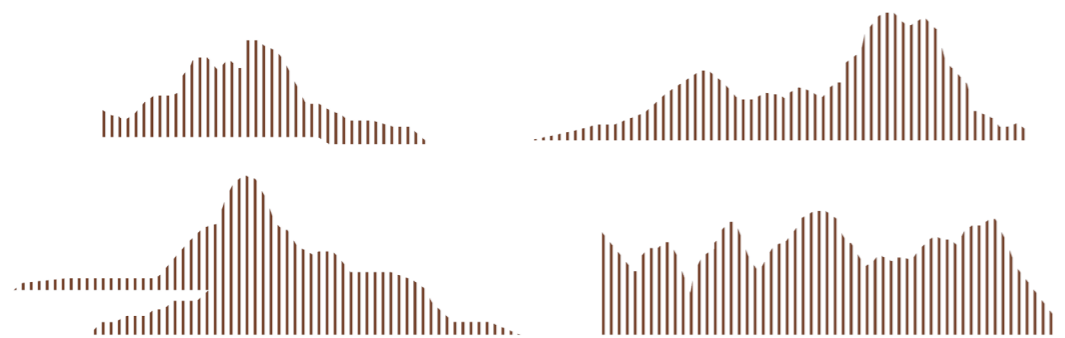
The somatosensory device uses real-time dynamic capture, combined with image recognition, voice input, etc., to enable people to interact with machines through actions. The feature of somatosensory device is that the influence of space on people directly acts on the human body, mobilizing vision, hearing and perception, so that people can obtain a comprehensive comprehensive experience.



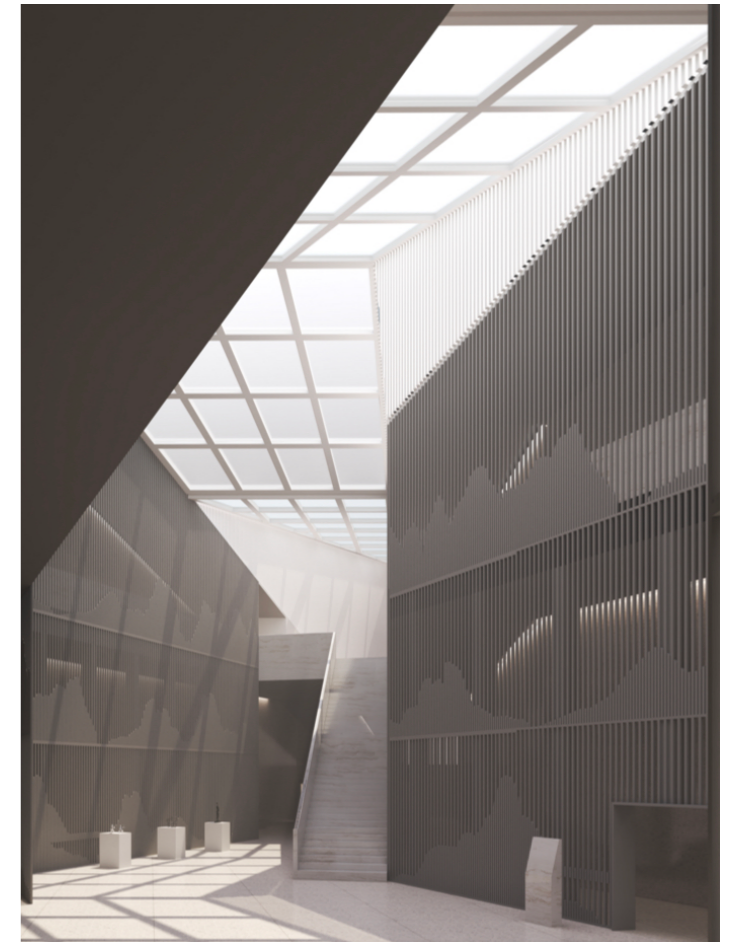
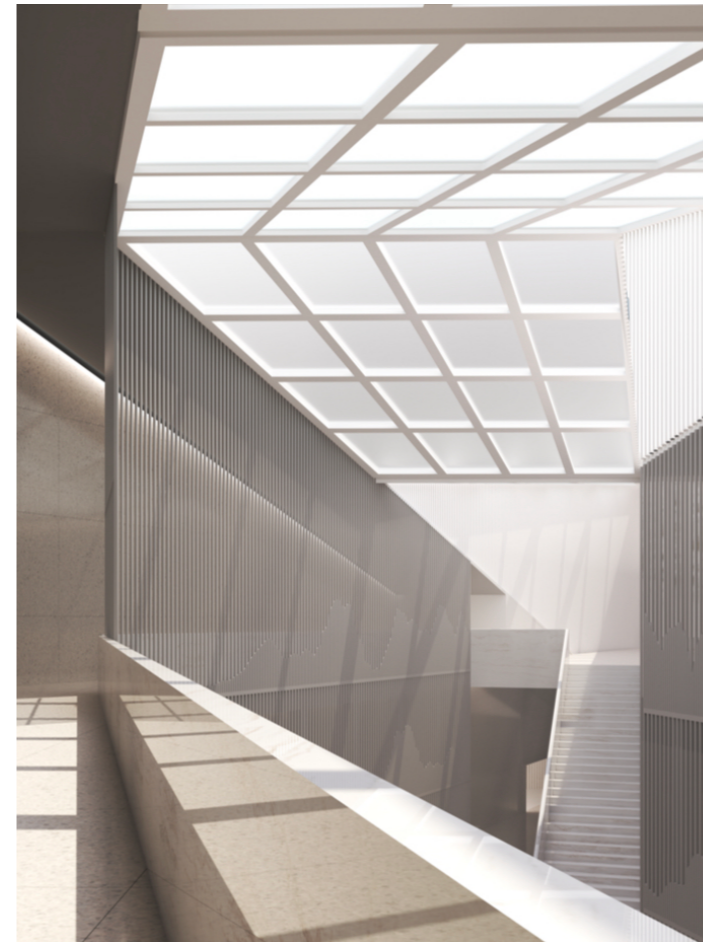
Atrium space in the grille



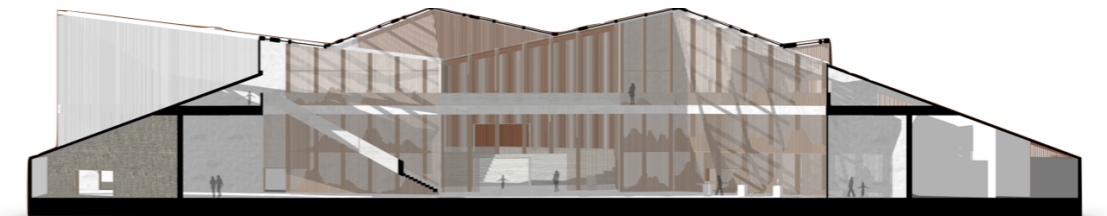
Traditional Chinese Painting "Qianli Jiangshan"



Pattern extracted from the painting



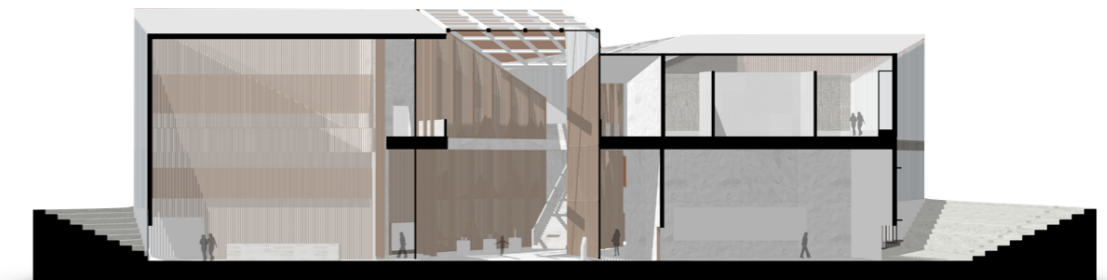
Section 1



Section 2



Section 3



DETAILS OF INSTALLATION DESIGN

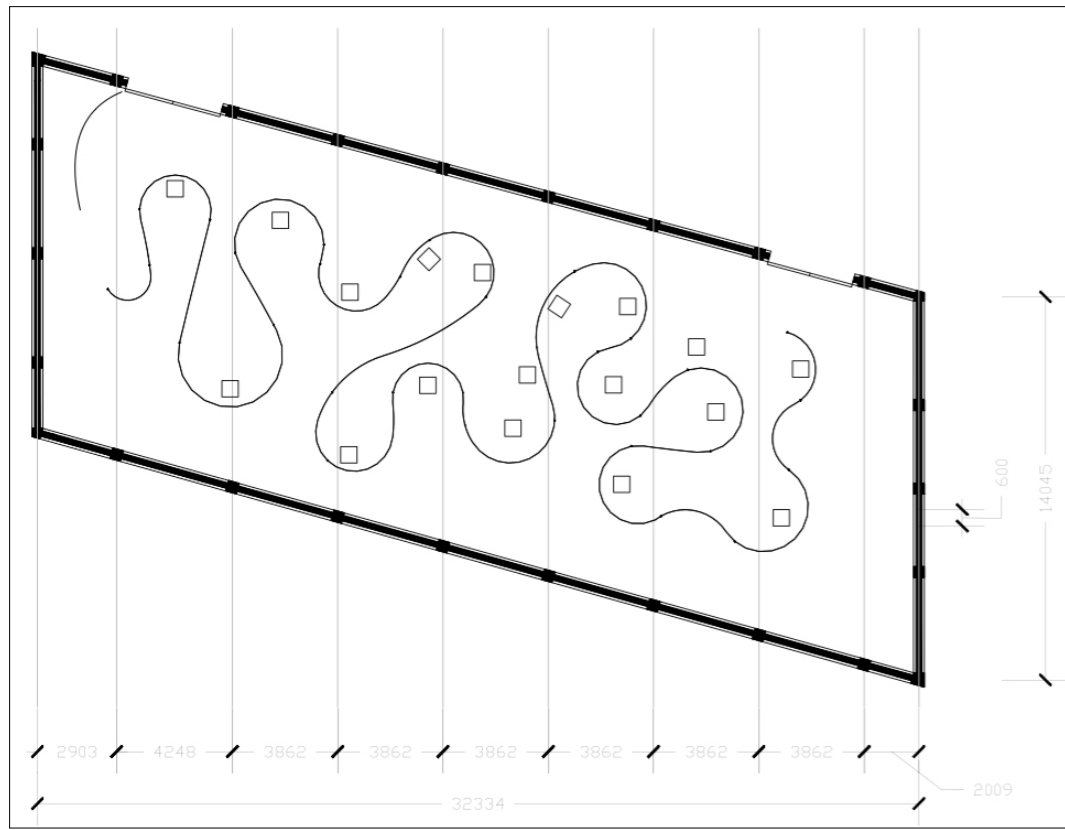
CHINESE OPERA KALEIDOSCOPE

The Xiqu Kaleidoscope is set on the first floor of the Xiqu Museum, with an exhibition area of 250 square meters and 18 booths for displaying classic repertoires from 18 different opera genres. Viewers traveled through the booth while browsing, and learned about the singing characteristics of different operas through listening to operas. In the survey, museums mostly display a single genre based on geographic location, and explore the historical changes and artistic achievements of the genre vertically. It is rare to see a museum display space that compares multiple genres horizontally or introduces them

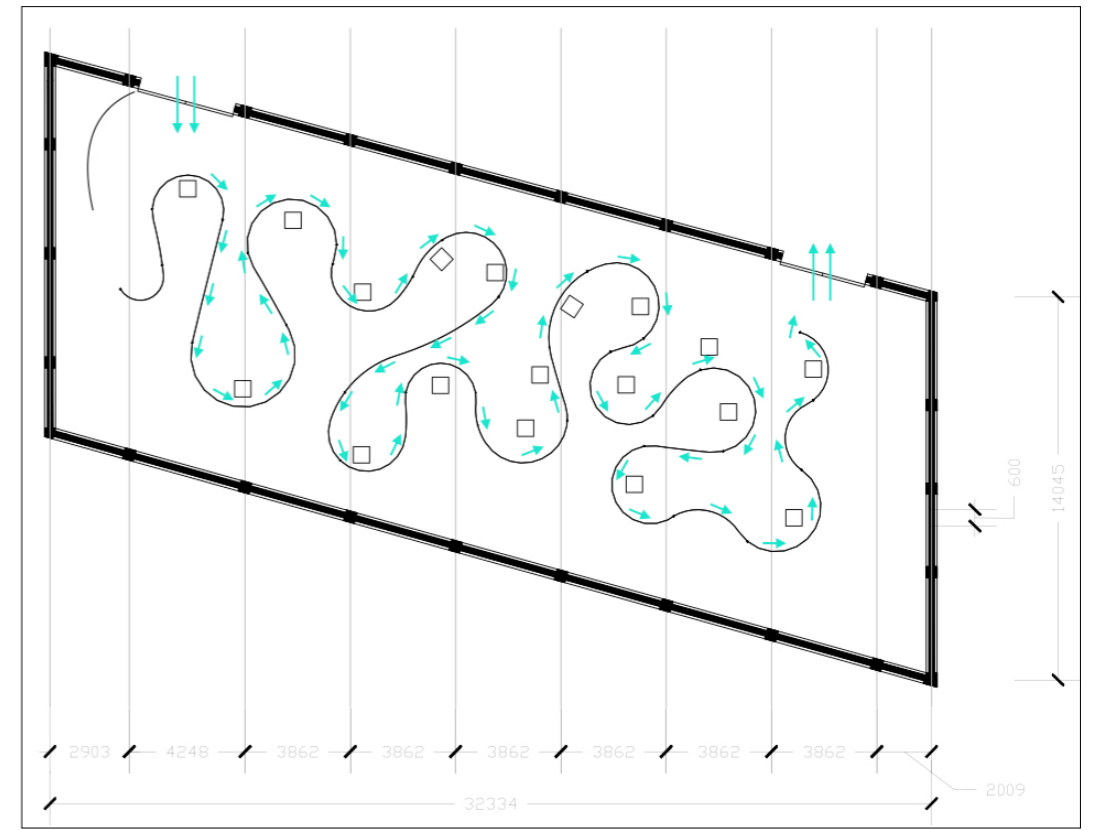
side by side. It hinders the audience's understanding of the overall appearance of opera art.

There is a holographic image projection on the top of the showcase, and viewers can interact with the installation through a mobile phone applet. The audience scans the QR code in the exhibition hall, and the current location of the audience is displayed on the mobile phone. The audience can use the front camera to view the details of the current "performance" content, including plot introduction, real-time subtitles, etc.

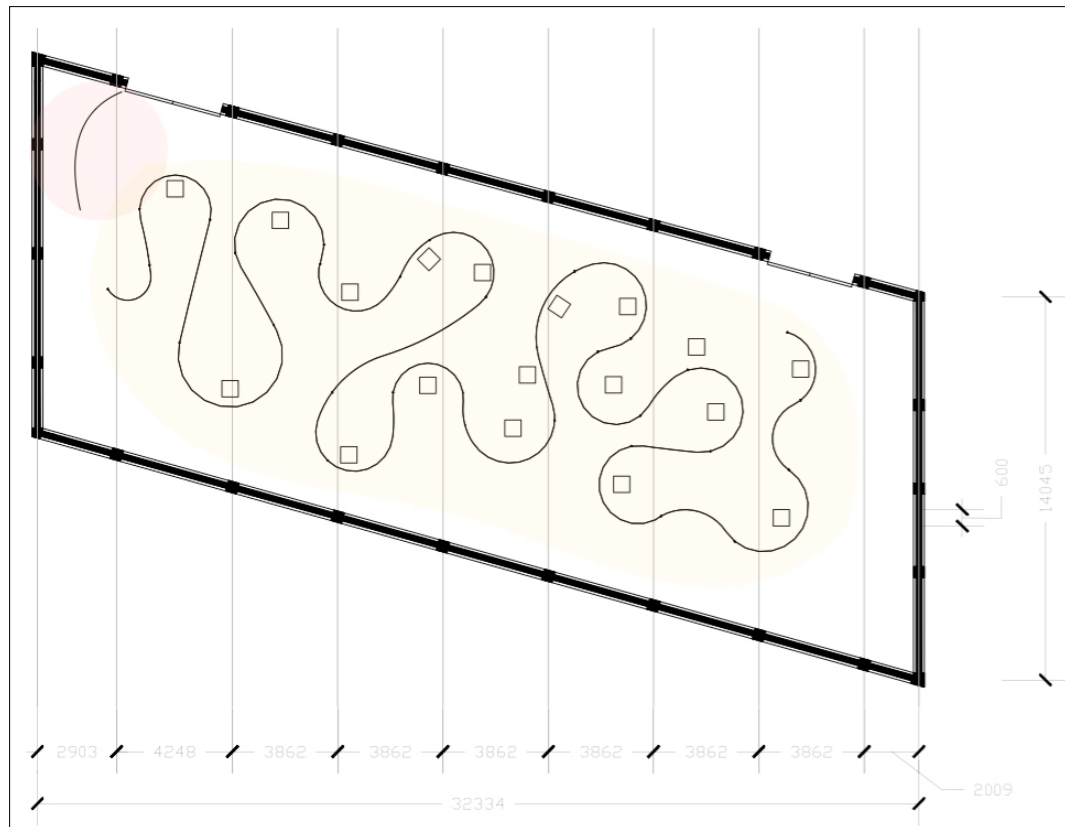




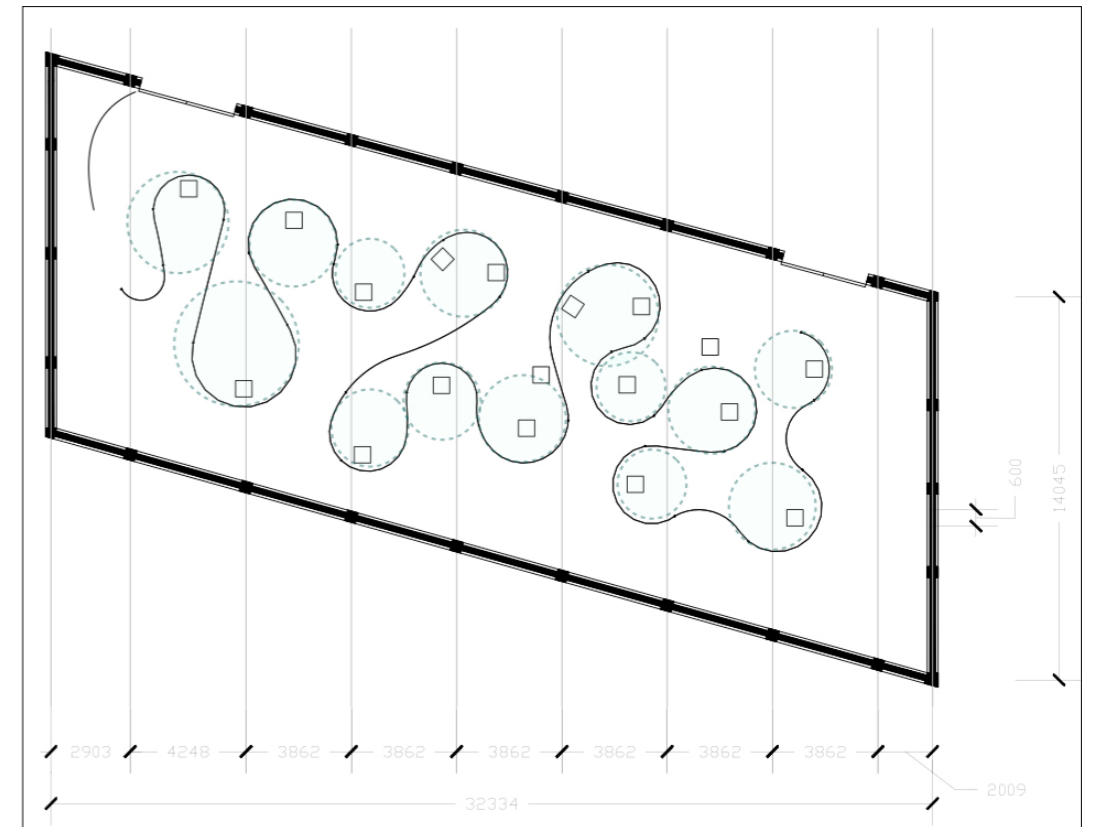
Plan



Movement



- Exhibition Preface and Equipment Rental
- Display Area



○ The corresponding sound signal range in the exhibition area

CONTENTS

Yuan Dynasty Suzhou Area Drama

In the Yuan Dynasty, Suzhou performed dramas in Goulan, and the singing standards were to know the beat, the word of the Tao, the right voice, the clear rhyme, and not be crazy.

Wei Liangfu and Famous Singers in Suzhou Area

Singers: Wei Liangfu, Deng Quanzhuo, Zhang Yunwu and Music: Wang Weitai

"Southern Citations"

Tang Xianzu and "Peony Pavilion"

Around the word "love", he rebelled against the old feudal ethics and criticized the darkness of officialdom.



Li Yuhe's "Qing Zhong Score"

A realistic play, showing the civic movement triggered by the political struggle between the Donglin party and the eunuch party in the late Ming Dynasty. Showed a magnificent scene of mass struggle.



Nanqu Nanxi

During the Southern Song Dynasty, Southern Opera borrowed from southern folk music and is considered to be the origin of Kunqu Opera. The representative work "Pipa"



Kunshan Tunes in the Late Yuan and Early Qing Dynasties

Gu Jian
Kunshan traditional singing
Nocturnal boat sequence six tunes
Later used for "Huan Sha Ji Fan Lake"



"Time Song"

The innovation of Kunshan dialect has become popular as "Time Songs", such as "The Lion's Roar", "The Red Brush", "The Jade Hairpin", etc.

The prosperity of Kun Opera in the late Ming Dynasty

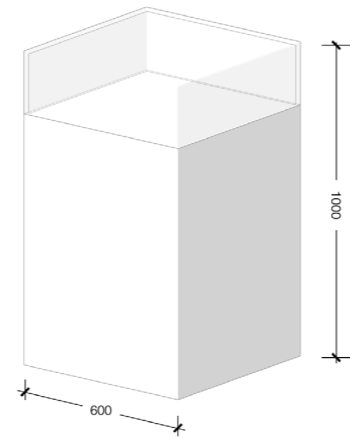
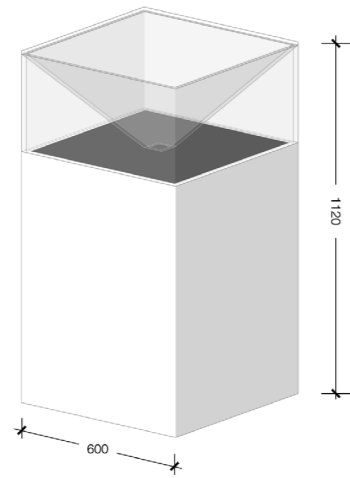
The rise of family troupes and the entry of Kunqu Opera into the court.

"The Prosperous Age of Kang and Qian" and Kunqu Opera

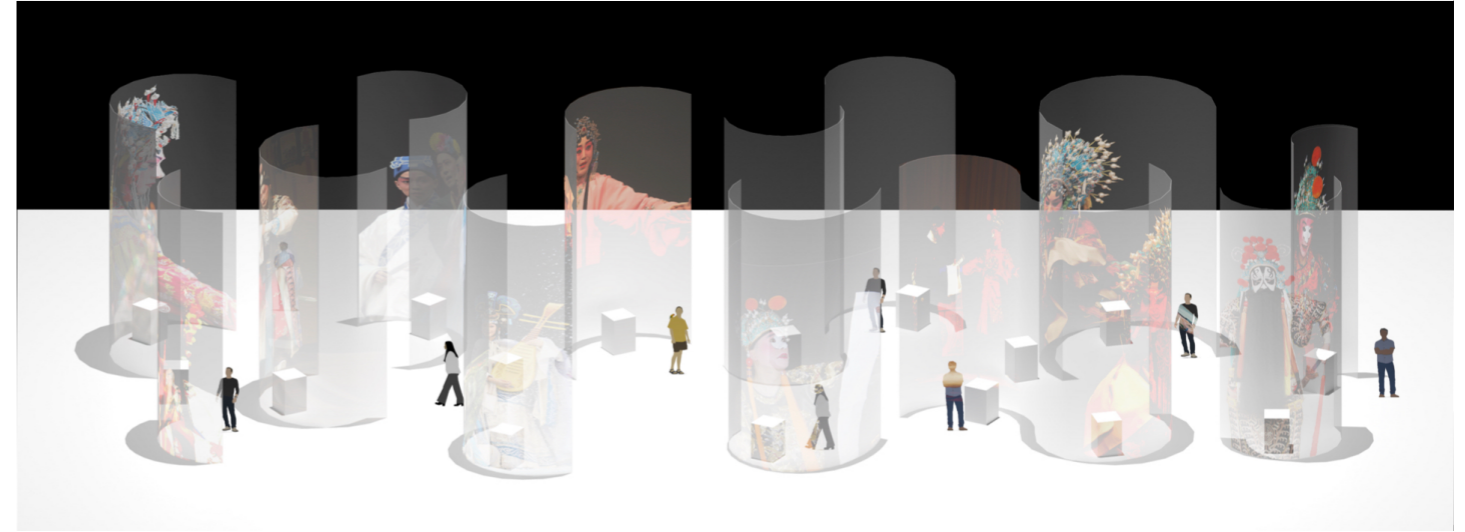
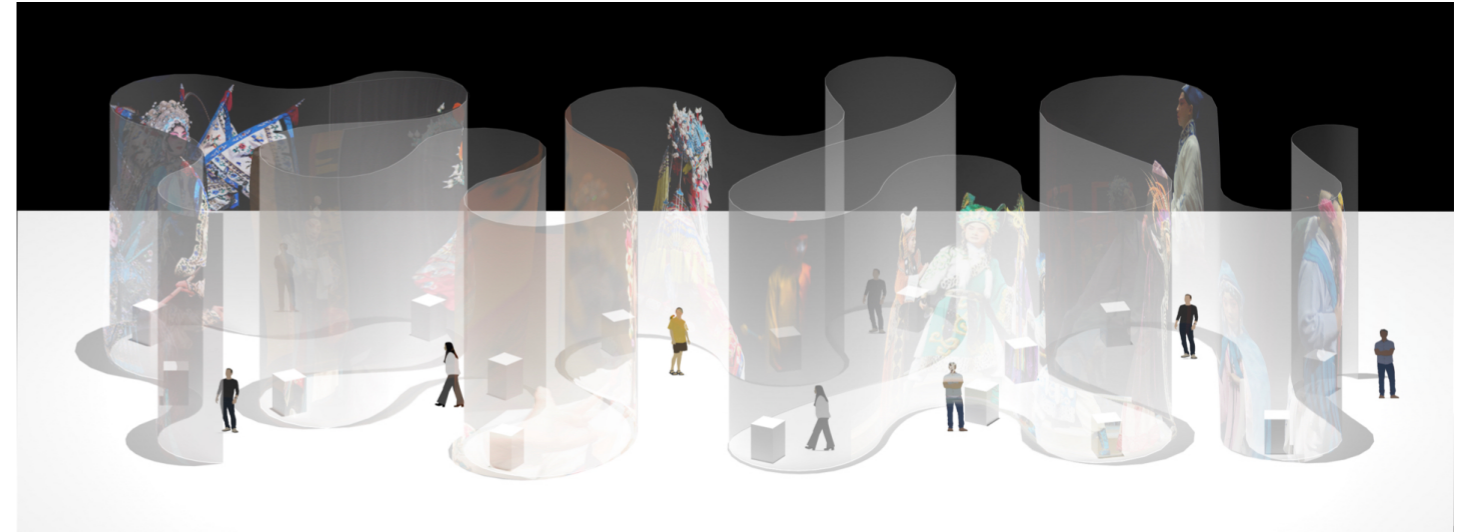
significant plays such as "The Palace of Longevity" and "Peach Blossom Fan"

CONTENTS

Title	Period	literary significance
"Wan Sha Ji"	Ming	The story of Wu and Yue's struggle for hegemony in the Spring and Autumn Period actually reflects the reflection of the historical laws of the prosperity and decline of feudal countries
"Peony Pavilion"	Ming	Breaking through the conflict between love and truth in traditional Chinese ethics and morality, trying to pursue an ideal love concept of "where the love is", "the living can die, and the dead can live"
"The Story of the Righteous Hero"	Ming	Based on "Water Margin", it reflects the social reality of rampant traitors, judicial disorder, and government corruption and corruption, and affirms justice. The end of the play shows that only by consciously maintaining the normal social order centered on the emperor can the moral standards destroyed by a few people be restored
"Leisure Occasion"	Early Qing	Health Theory in Ming and Qing Dynasties
"The Kite Mistake"	Early Qing	Known for its "novelty in the eyes" and "dense needles and threads", it writes the concept of marriage and love of young men and women. Although it is not an orthodox concept, it is regarded as a standard for personal pursuit of love. admit in practice·



TWO FORMS



Two different types of space base on Deformable Holographic Film System

MECHANICAL DETAILS

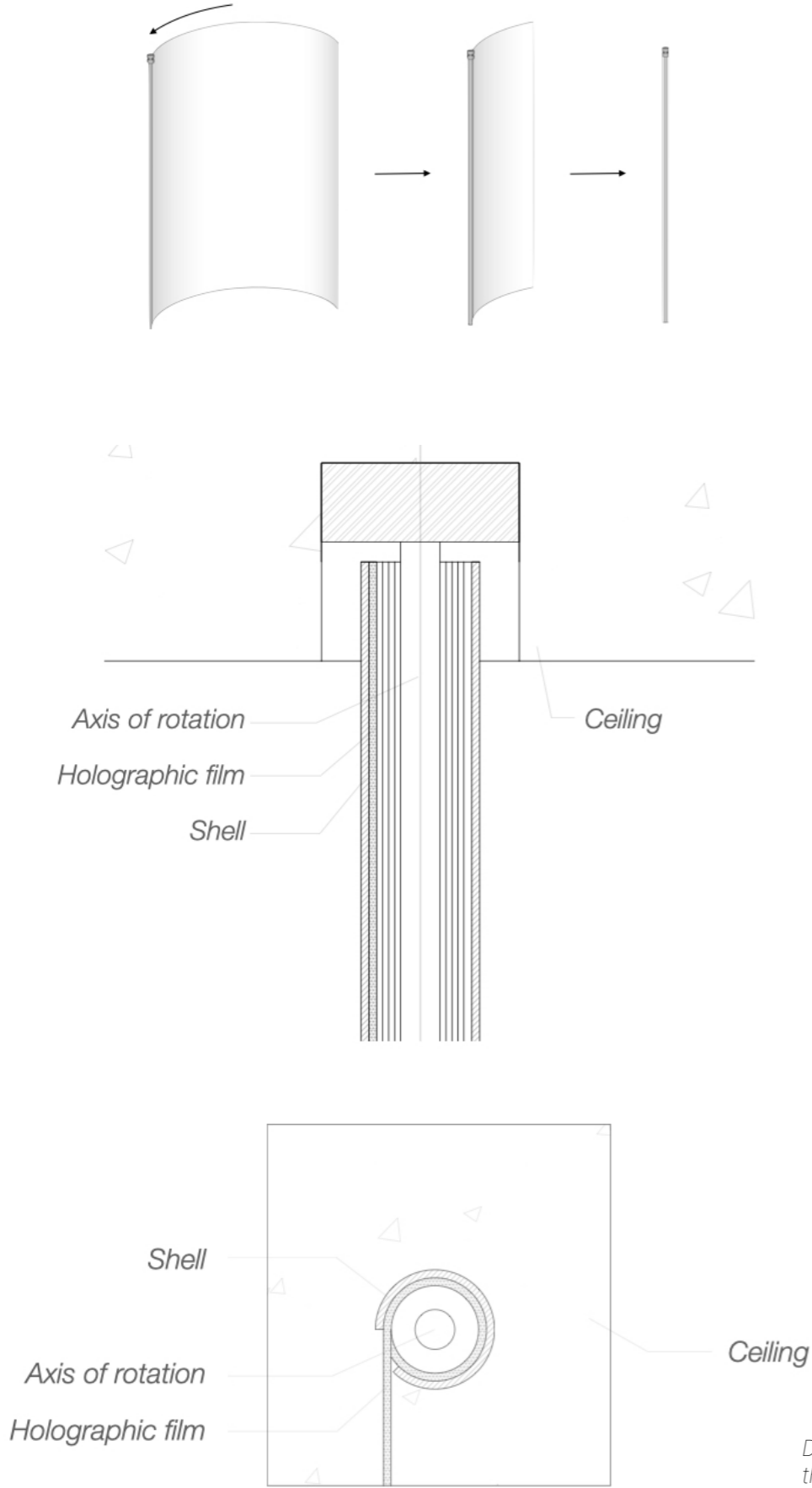


Diagram of the structure of the holographic film

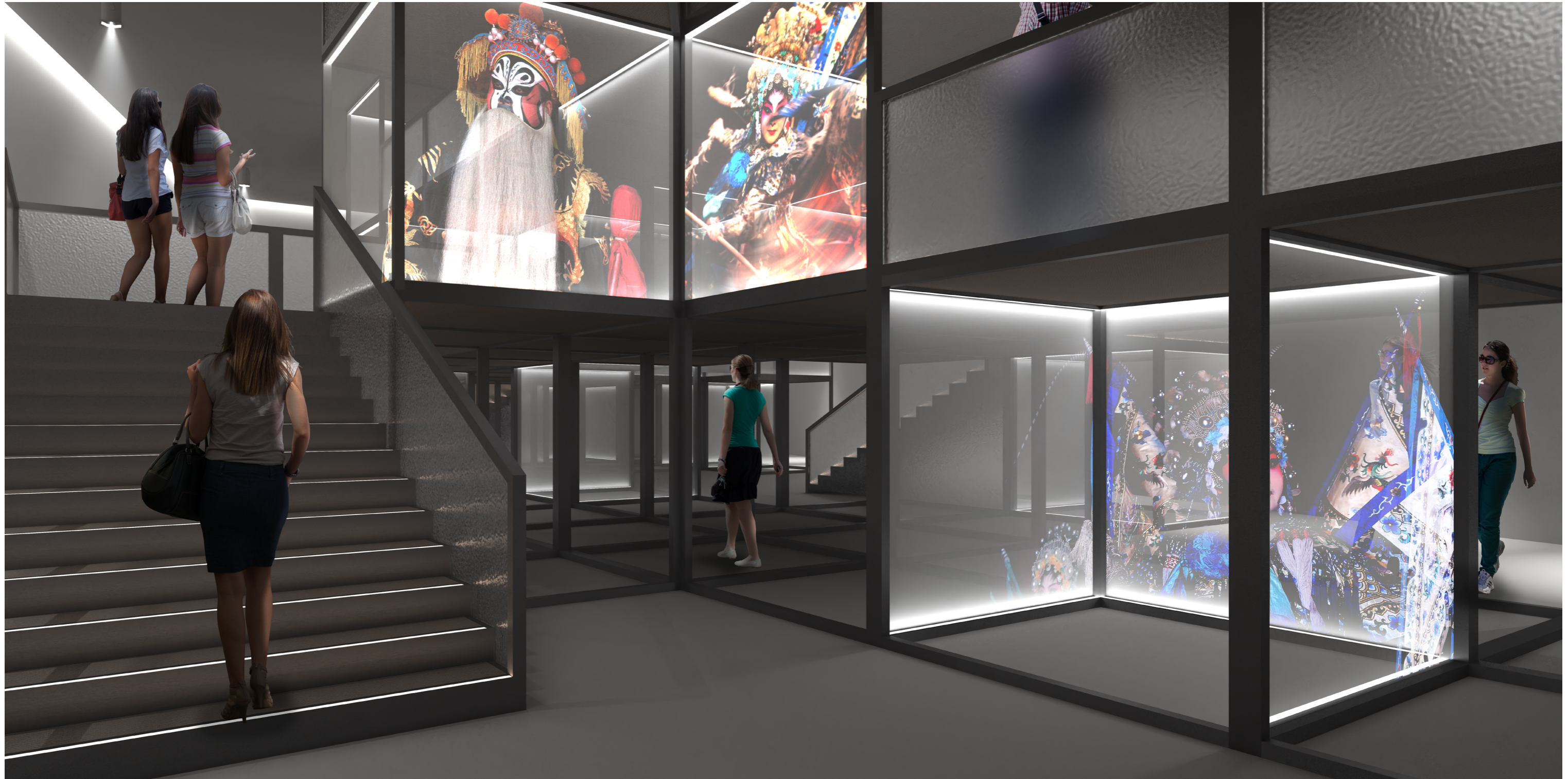


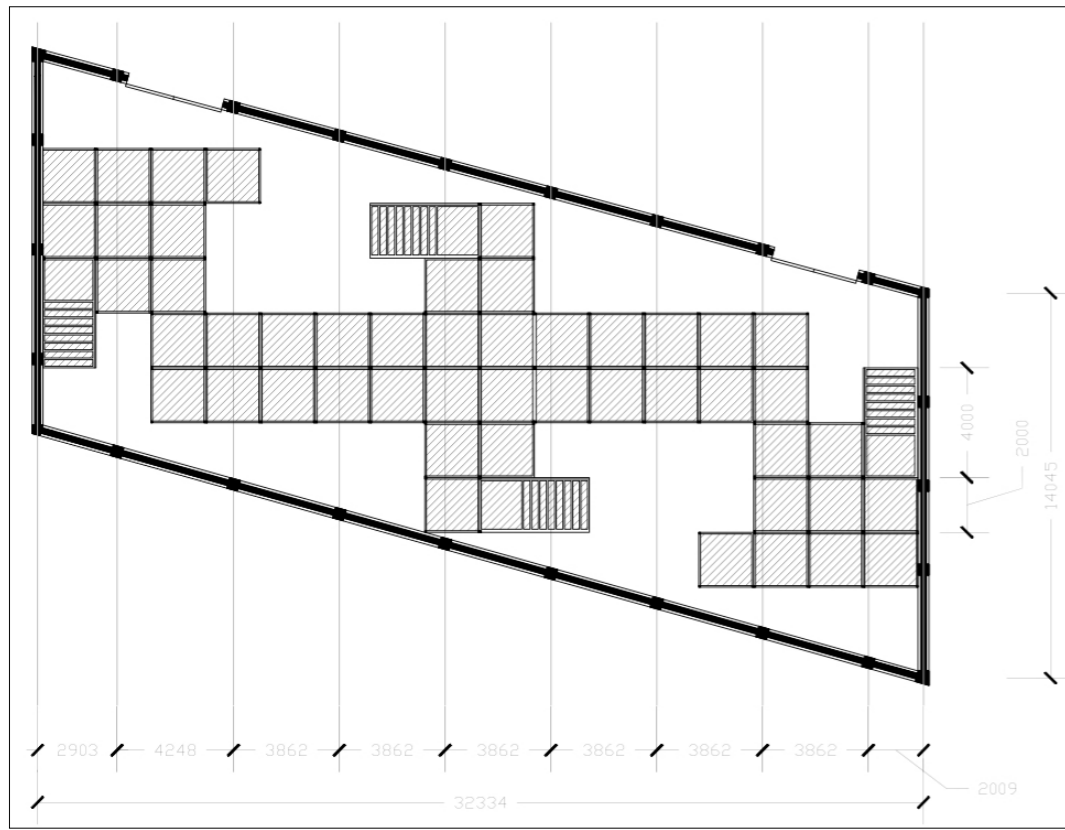
OPERA STAGE

The Xiqu Space-Time Stage is located in the exhibition hall on the first floor, with an area of 250 square meters. In the pavilion, there are several "drama boxes" of one meter square with different heights, which are connected to each other by stairs and bridges. Different "Opera Boxes" display different themes, including "Peking Opera Masks", "Detailed Repertoires", "Peking Opera Costumes", "Singing, Reading and Doing", "Taiwan Step Introduction", "Liyuan Artists" and so on. After entering a "drama box", people enter a theme, interact with the box through gestures, and then understand the content of the theme.

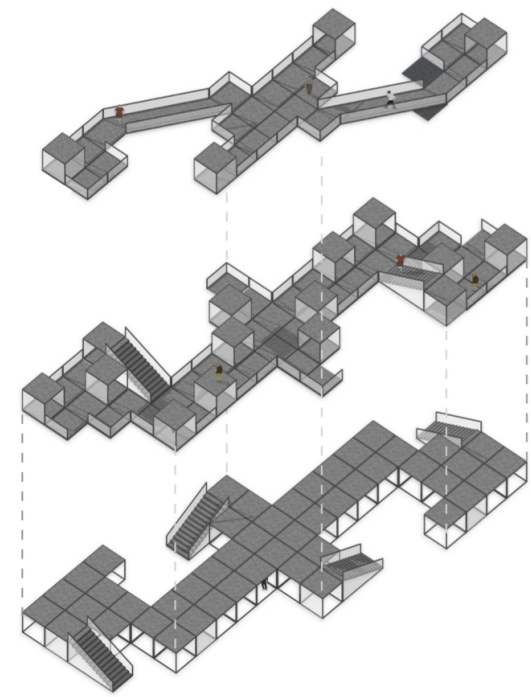
In the "Peking Opera Masks" installation, graphics processing technology is used to generate different characters' masks according to different facial expressions of people, and introduce them. In the "Detailed Track", viewers can choose a classic aria to listen carefully, sing along, and record. "Peking Opera Costumes" introduces the details of the costumes, headgear and props of different characters on different occasions based on images and plots.

As a stage art, opera takes place in the same time and space where the audience and the actors are. The actor is the object to be observed, the audience is the subject of observation, and every moment cannot be duplicated. Such an interesting relationship also occurs in every corner of the exhibition hall installation. Due to the complex shape of the installation and the variety of visual level changes, when the viewer interacts with the "drama box", he himself becomes the object to be observed, conveying the unique charm of stage art through body language.

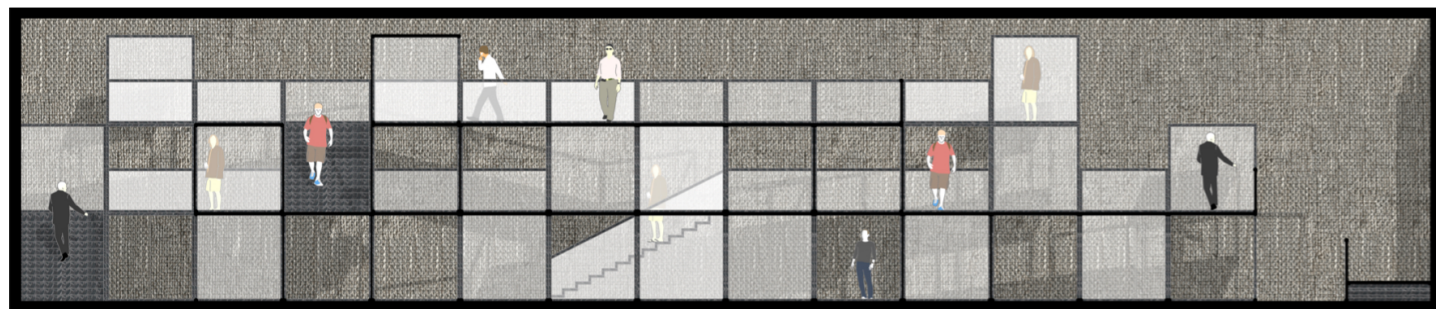




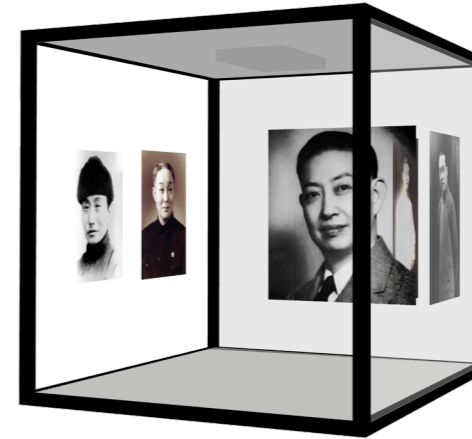
Plan



Structure & sections



FUNCTION OF EACH BOX



BOX 1 OPERA MASTERS

An interactive installation for the introduction of opera masters and works

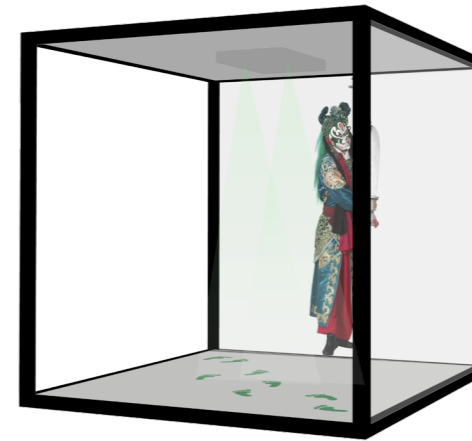
Switch between opera masters through a variety of gestures, and select an opera master to watch its introduction and classic characters.



BOX 4 MASKS

Character and Facebook interactive installation

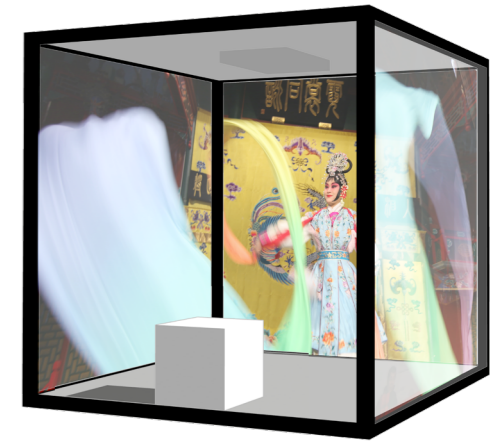
Facial expression recognition changes the facebook, and gestures switch between different facebook roles



BOX 3 BODY MOVES

Footprint and body experience interactive installation

According to the ground projection and guidance, make a walking position similar to the characters in the image

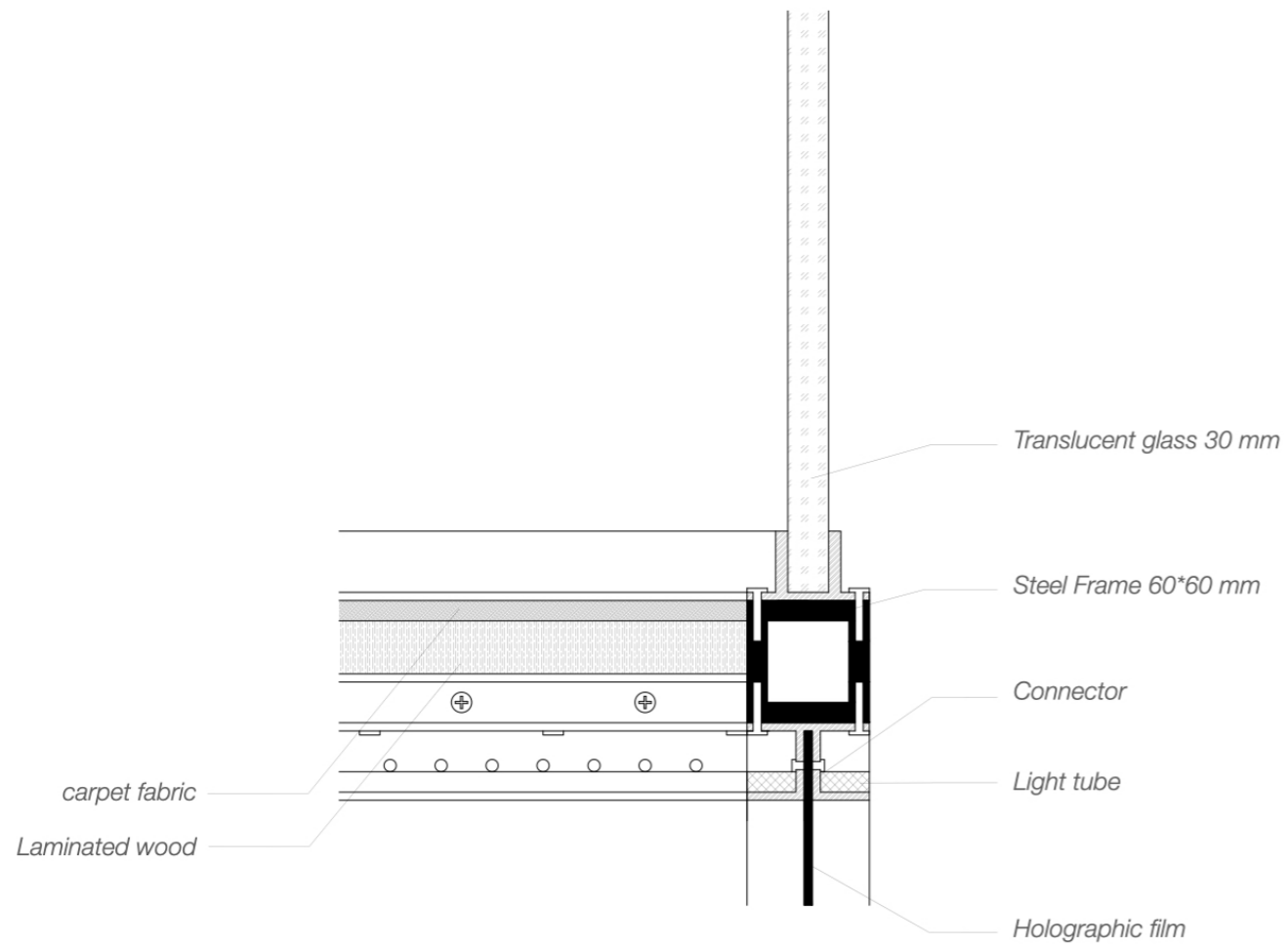
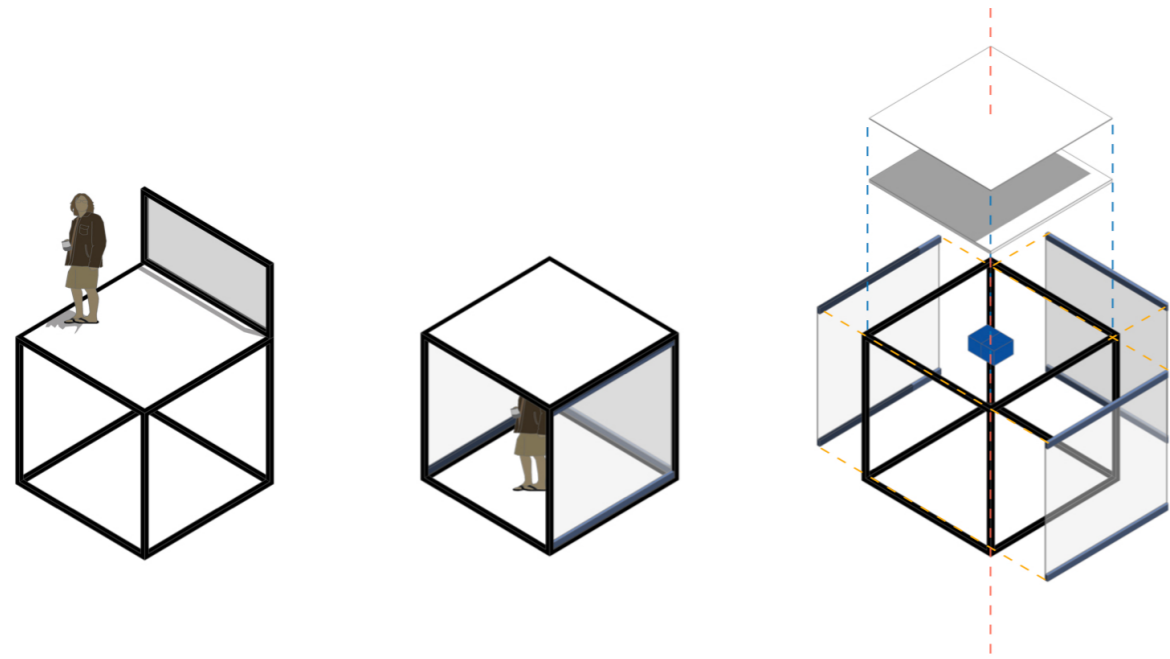


BOX 2 OPERA ROOM

Immersive theater-watching interactive installation

Create an environment for one person to watch opera videos

BOXES



BOXES

