



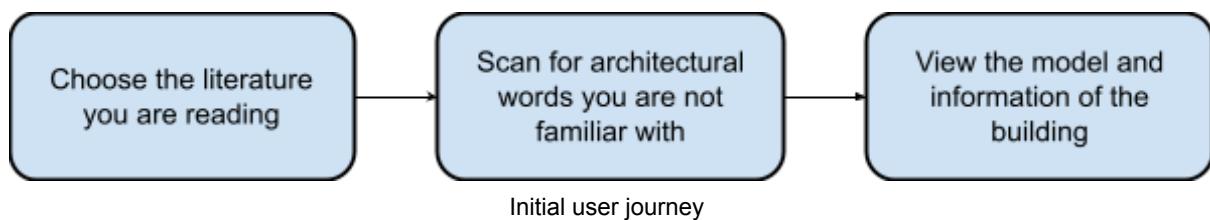
**9201A3**  
**AR experience prototype and documentation**

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## Prototype Description

Do you have a hard time imagining the scene depicted by the writer when you read ancient literature? Maybe you want to go to the place where the story happened, but due to geographical restrictions, travel difficulties under the epidemic, and high travel expenses, you can't take a walk-and-go trip. What's more, after the changes of the times, those buildings may have long since disappeared in the torrent of the times. Maybe you want to ask for help from the Internet, but a lot of information is in front of you, and you need to spend a lot of time to find what you really want.

*Literature+* can just solve your problem. When you see an unfamiliar building in the book, you can scan the text to view the model of the building and the ancient paintings of the same period of the building, which will help you better understand the scene described in the literature. Although there is only a simple prototype at present, in the future, *Literature+* will strive to obtain the copyright of more literary works and invite modelers to design architectural scenes in the works.



Since I could not find an architectural model for a certain literary work, the user journey of my Unity prototype started from the second step.

## Responds to Design Brief

Architecture is time-limited, and the technology and production methods of each era make different eras have different needs for architecture. Our city is overthrowing old and aging buildings and building new buildings at every moment. Except for those buildings with obvious cultural value, most urban buildings are inevitably overthrown and rebuilt again and again. Take Beijing, the capital of China, as an example. In the ten years since the founding of the People's Republic of China, the area of newly built buildings in Beijing is equivalent to the reconstruction of a Beijing city.<sup>[1]</sup> There are many new buildings in the city, so where can we get a glimpse of the city in the past, especially those ancient cities that have no photo records?

Archaeologists can restore their appearance through painting and modeling after investigating the ruins and consulting classics, but it is difficult for ordinary people in non-academic circles to imagine the appearance of ancient buildings. Ancient literary works are one of the ways that the public is exposed to the description of ancient cities. These literary works are available everywhere, at least much simpler than the acquisition of academic literature, and at the same time more vivid and interesting. Even though these texts have described the scene as much as possible, it is still difficult for the public to restore a past building in their minds due to the time passed too long and the cognitive limitations of non-professionals. Just as the Dream of Red Mansions spent a lot of time describing the scene of the Grand View Garden, but I still can't imagine its prosperity,

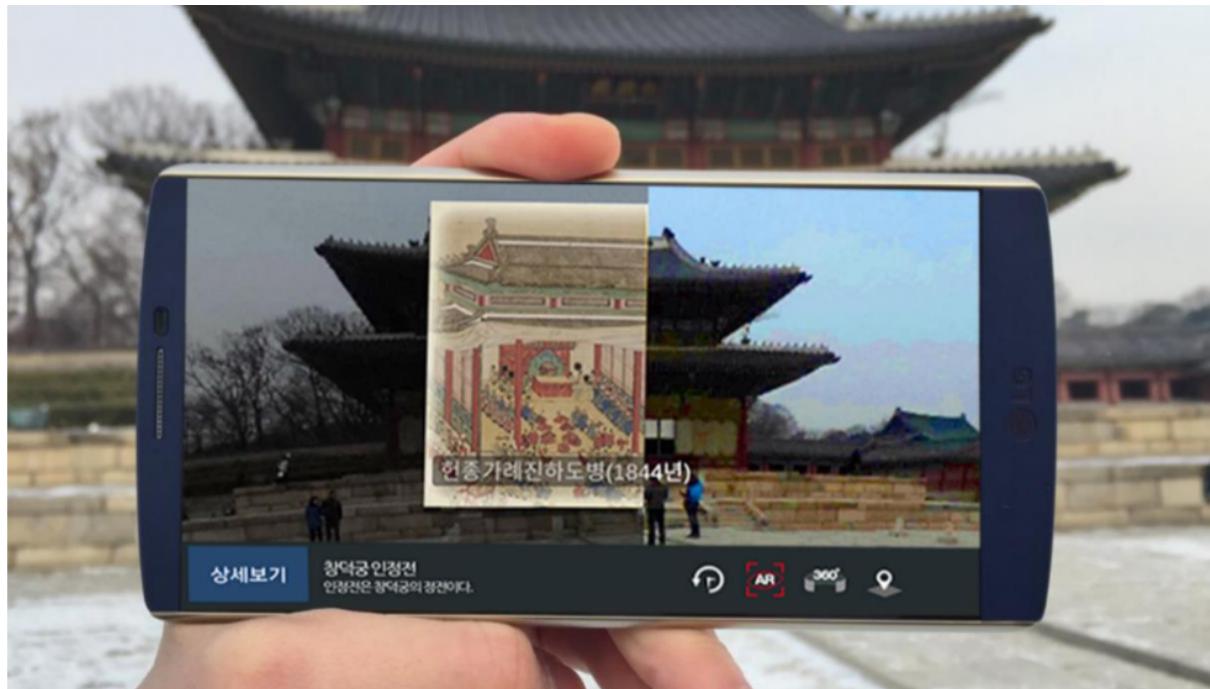
because I have never seen many architectural components and architectural decorations in reality.

Literature+ hopes to provide some basic architectural models, at least so that people can know what is a palace, what is a pavilion, what is an arch, and what is a cloister. So that people can better imagine the urban architecture of the past based on these basic architectural structures.

## Design Process

### Ideation

My idea was inspired by a Korean project, AR reference model for K-culture time machine. In the week 9 lecture, Dr. Callum Parker introduced this project to us. Tourists can scan the ancient buildings in South Korea to view the paintings depicting the building, so as to understand the use of this building in the past. So I also had the idea to design a prototype of urban digital heritage.



AR reference model for K-culture time machine[2]

At this stage, I determined my problem space. I hope to give people more information of some ancient buildings that have disappeared and do not exist in the world. Because famous buildings such as the Forbidden City, the Pyramid, and the Louvre are relatively intact and have been well repaired and protected, the public has sufficient channels to understand them. In addition to these iconic cultural buildings, there are also many famous buildings that were destroyed during wars and natural disasters, or buildings that were demolished because they had no special historical value. Those exquisite or rustic houses, courtyards, shops, and hotels once constituted a prosperous city, but people know very little about them.



Screenshot of the vr project launched by the Forbidden City[3]

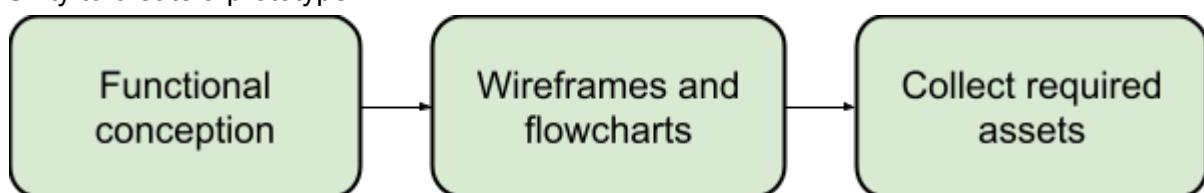
Given the current immigration restrictions and my technical limitations, scanning building ruins seems difficult. So I decided to use words as the markers of literature+. They are easy to obtain and easy to recognize, and the words themselves are cultural symbols. Although some buildings no longer exist, they are still depicted in the literary works of the past dynasties, and some are marked on their ruins. People can scan the architectural terms printed on other items, or print out the corresponding text when they want to use the app, or type the word on the phone screen and scan it.



Inscriptions on the Ruins of Lanting[4]

## Evaluation

I developed my concept through the following three steps. Clearly conceiving the functions I need and determining the art resources I will use makes me more organized when using Unity to create a prototype.



- Functional conception

About the building model:

1. The model appears after scanning the word
2. The model can be zoomed in and out with the mouse wheel
3. Clicking on the parts of the model appear pop-ups

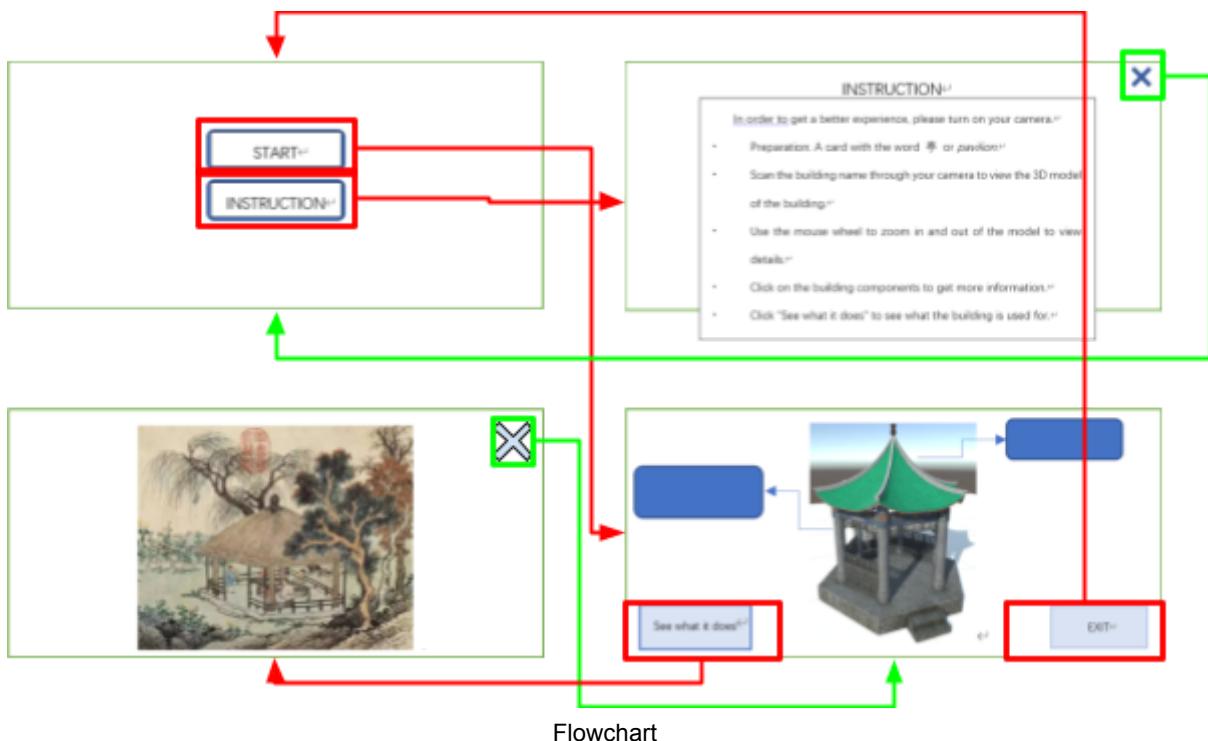
About the ancient painting:

1. Click the button and the picture appears
2. Zoom picture by mouse wheel
3. The picture can be dragged with the mouse

About background music:

1. The audio will play after clicking the start button, and the audio will stop playing after clicking exit.

- Wireframe and flowchart



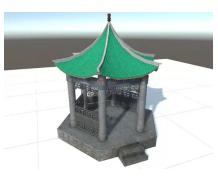
Flowchart



Functional document screenshot

- Collect required assets

In order to maintain the consistency of the aesthetic style of the prototype, my art resources all use the classical ink style. In order to match the theme of this prototype, I chose a guqin piece depicting the leisurely mood of taking cool water by the water in summer as the background music.

Button		<a href="https://90sheji.com/sucai/17598160.html">https://90sheji.com/sucai/17598160.html</a>
Background image 1		<a href="https://www.pngsucai.com/png/14720.html">https://www.pngsucai.com/png/14720.html</a>
Background image 2		<a href="https://zh.pngtree.com/element/down?id=NDQ0MTk5MA==&amp;type=1&amp;time=1636472734&amp;token=ZjljYmQ5NWU1NjViZDkwY2YxYzU4NTkzYzYwMmE3Y2M=">https://zh.pngtree.com/element/down?id=NDQ0MTk5MA==&amp;type=1&amp;time=1636472734&amp;token=ZjljYmQ5NWU1NjViZDkwY2YxYzU4NTkzYzYwMmE3Y2M=</a>
Background image 3		<a href="https://588ku.com/ycpng/12809044.html">https://588ku.com/ycpng/12809044.html</a>
Pop-up		<a href="http://3png.com/a-32749984.html">http://3png.com/a-32749984.html</a>
Building model		<a href="https://assetstore.unity.com/packages/3d/environments/industrial/chinese-pavilion-3d-model-157126">https://assetstore.unity.com/packages/3d/environments/industrial/chinese-pavilion-3d-model-157126</a>
Painting		<a href="https://baijiahao.baidu.com/s?id=1638605317098263164&amp;wfr=spider&amp;for=pc">https://baijiahao.baidu.com/s?id=1638605317098263164&amp;wfr=spider&amp;for=pc</a>
Music		<a href="https://music.taihe.com/player/?__methodName=mboxCtrl.playSong&amp;fm=altg&amp;__argsValue=T10046345891#">https://music.taihe.com/player/?__methodName=mboxCtrl.playSong&amp;fm=altg&amp;__argsValue=T10046345891#</a>

## Summary of final project

### Interface 1:

This interface has two buttons. The start button will directly jump to the AR recognition interface (interface 3). The introduction button will jump to the introduction page (interface 2). In this interface, I used an ink and wash landscape painting as the background of this page. The fit between architecture and environment is one of the aesthetic criteria of Chinese classical architecture.



### Interface 2:

This interface is used to introduce users to how to use the project.

#### INSTRUCTION

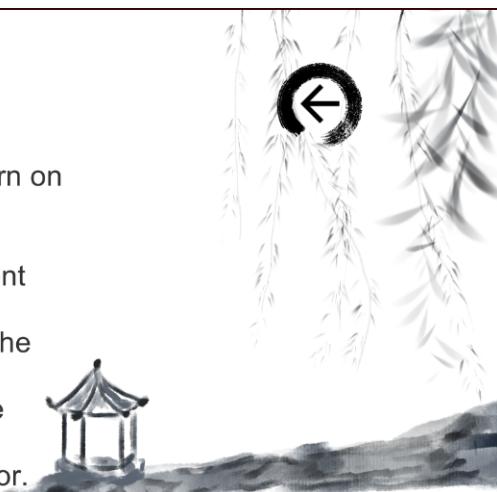
In order to get a better experience, please turn on your camera.

Scan the Picture attached in Project Document through your camera.

Use the mouse wheel to zoom in and out of the model to view details.

Click on the building components to get more information.

Click "Use" to see what the building is used for.



### Interface 3:

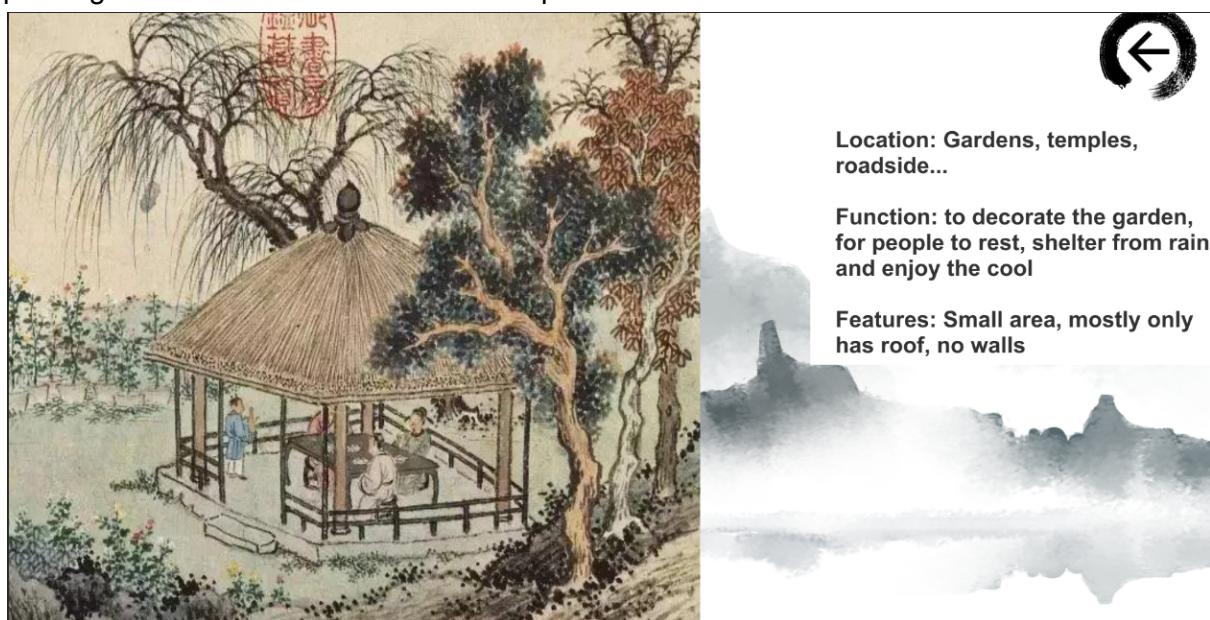
In this interface, users can scan the Chinese character 亭 (which means pavilion) to view a pavilion model. Click the different parts of the model will pop up introductions to the building components of the pavilion.

There are two buttons at the bottom of the interface. After clicking the use button, the user will jump to interface 4 to view the past use of the building. Click the exit button the user will exit to interface 1.



### Interface 4:

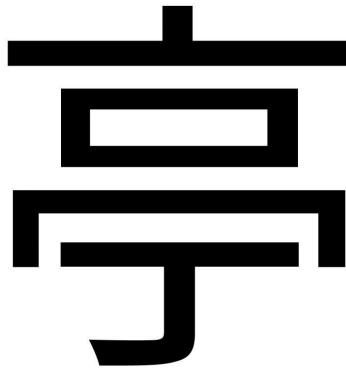
This interface shows an ancient Chinese painting about the pavilion. The user can use the scroll wheel to zoom in on the painting to view the details or use the mouse to drag the painting. Click back button which in the top left of the interface user will back to interface 3.



# Setting Guide

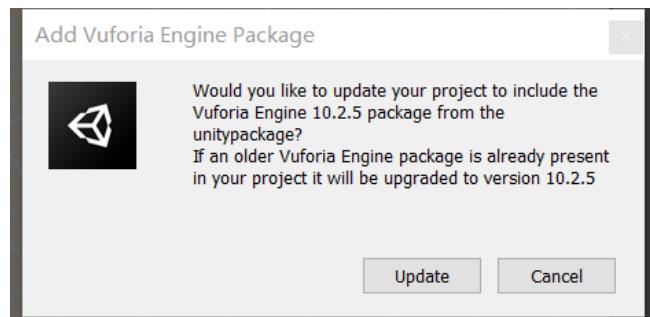
- **Marker image:**

Please download this image to your electronic device or print it. It will be used in interface 3 as a scanning marker.

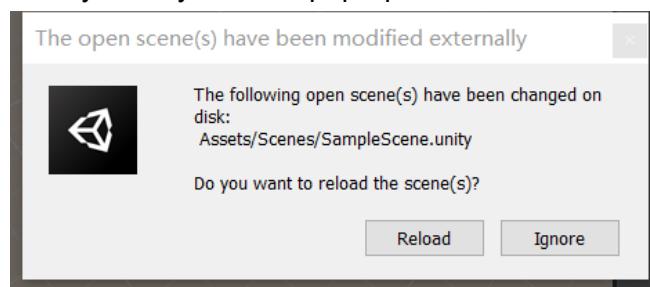


- **Import the Unity package:**

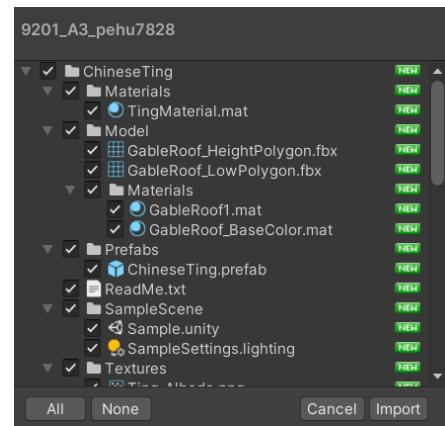
1. Create a new Unity 3D project.
2. From the top menu, select Assets > Import Package > Custom Package...
3. Select the downloaded package **9201\_A3\_pehu7828** and click Open
4. Click on Import to get all files to the new Unity project
5. If this pop-up window appears, select Update.

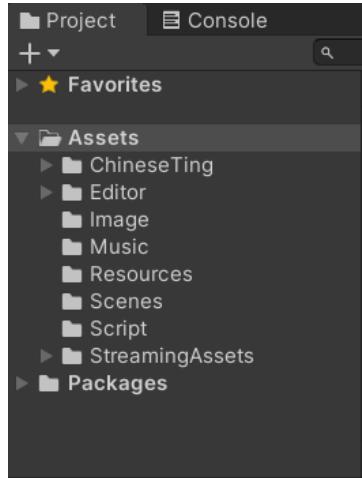


6. Then you may see this pop-up, select Reload



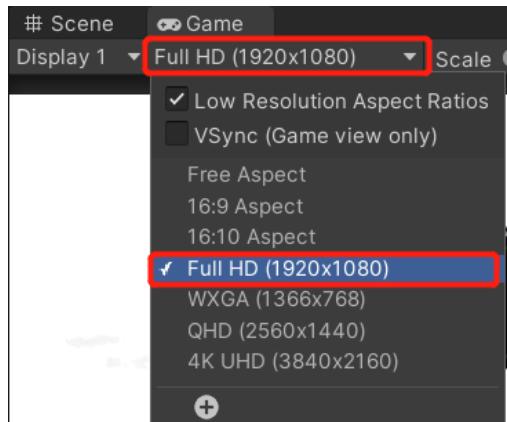
7. Once it's done, you will see all folders in the Project view.





- Play:

1. Set the size of the game viewport to **Full HD (1920\*1080)**



2. Click the Play button

## Future Work

Due to time and capacity constraints, this prototype is relatively rough and simple. If there is more time to create this project, I will invite some modelers to create the buildings that appear in Create French, and invite animators to create animations of people's activities in these buildings.

## Reference

- [1] Xinhuanet.com. 2021. 奋斗百年路 启航新征程 | 这些楼的故事不简单——从北京“十大建筑”变迁看变化-新华网. [online] Available at: <[http://www.xinhuanet.com/politics/2021-04/19/c\\_1127348729.htm](http://www.xinhuanet.com/politics/2021-04/19/c_1127348729.htm)> [Accessed 8 November 2021].
- [2] Kim, E., Jo, J., Kim, K., Kim, S., Hong, S., Kim, J. I., ... & Woo, W. (2016, July). AR reference model for K-culture time machine. In international conference on human interface and the management of information (pp. 278-289). Springer, Cham.
- [3] 2021. *Screenshot of the vr project launched by the Forbidden City*. [image] Available at: <<https://v.dpm.org.cn/yangxindian/tour.html>> [Accessed 10 November 2021].
- [4] 2021. *Inscriptions on the Ruins of Lanting*. [image] Available at: <<https://zh.wikipedia.org/wiki/%E5%85%B0%E4%BA%AD>> [Accessed 10 November 2021].