Context and Shelter: An Exploration of Domestic Space

Rongrong Gao[1] , David Marc Schafer[2] and Paijit[2]

[1]Master of Fine Art, Rangsit University, rongrong.g63@rsu.ac.th

[2]Master of Fine Art, Rangsit University, david@studiomake.com

[3] Master of Fine Art, Rangsit University, paijit948@gmail.com

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ABSTRACT

With the rapid development of China's economy, people have higher and higher requirements for housing. The phenomenon of reverse urbanization appears, and more young people come to live in rural areas. The Chinese government strongly supports rural development, and the economic conditions of rural residents are gradually getting better. Residents have more expectations for a comfortable living environment, so I focus on rural housing design. Taking the rural areas of Dandong, Liaoning province, my hometown, as the research area, and the traditional Chinese trunk family as the research object, a house is designed and built in this area to meet the living needs of the trunk family. This paper is divided into three parts: research and analysis part, residential design, and interior design. Complete this article in a way that leads to design generation and presentation through research and derivation.

Keywords: Residential design, Family life cycle, Interior design, Spatial flexibility.

1. Introduction

With the rapid development of China's economy, people's living standards have been greatly improved, and the requirements for housing have changed from basic safety and warmth to comfortable enjoyment. And with the development of cities, the phenomenon of reverse urbanization appears, and more and more young people come to live in the countryside; China is a populous and agricultural country. The Chinese government has given strong support to rural development and the improvement of rural life. Under the favorable economic conditions and policy support of rural residents, coupled with residents' expectations for a comfortable living environment and young people's hopes to adapt to rural life, the above three reasons prompted me to focus on rural housing design. Taking the rural areas of Donggang area in Dandong city, Liaoning Province, my hometown, as the research background, and the traditional Chinese trunk family as the research object, I designed and built a house in this area to meet the living needs of the trunk family. The structure of this paper is presented in three parts, the first is the research and analysis part, and then from the two aspects of residential design and interior design, with research derivation to promote the design generation and presentation of the way to complete this paper. This article mainly discusses the question is how to use design to solve housing and the relationship between the people, uphold the people-oriented principle, discusses the face with time, the change of family members and family members to the changing needs of

the situation, the architectural design, and interior design how to better meet these changes and demand, to prolong the service life of residential, Increase the emotional connection between people and houses. The house is no longer just a "box" for shelter from wind and rain, but an important carrier of family members' emotional links and dependence.

2. Objectives of the study

1) Combined with the local regional characteristics, the design conforms to the local housing.

2) High efficiency and energy saving to improve the lighting system of local residential buildings.

3) Combine the concept of the family life cycle to design the residential space to make the residential use more flexible.

4) The main contribution of this paper is to provide a reference for residential design in cold regions.

3. Materials and methods

At the beginning of the research and analysis, I mainly adopted the method of combining text data collection and field investigation.

5) Background research.

From a social point of view, with the rapid economic development, urban life is stressful and polluted. Coupled with the COVID-19 pandemic, working from home has become the norm, and the development of the Internet has made working from home possible. From a personal point of view, rural life represents a slow lifestyle that can reduce commuting time, lower living costs, wider living space, and healthier food sources. All this has prompted many young people to choose to return to the countryside, as shown in Figure 1.

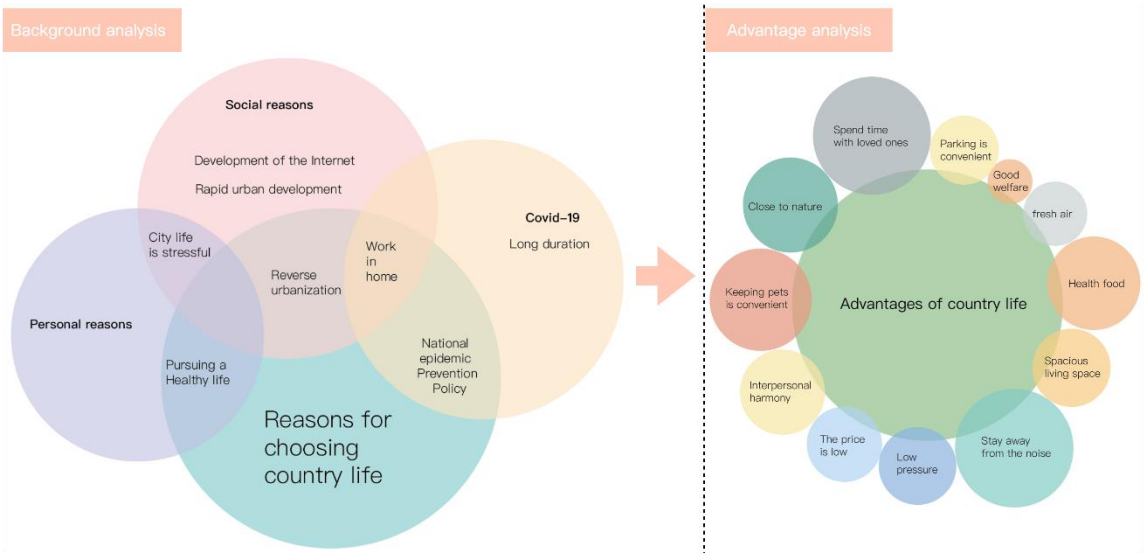

Figure 1

6) Field trips

I went to my home village in Donggang city of Dandong, Liaoning Province for a field trip. The rural residential buildings in this area have a large volume and wide area, but due to the constraints of economic and technological factors, they have been in the stage of extensive design and construction, with high energy consumption and low thermal comfort. As shown in Figure 2, most houses face north and south. Toilets and corridors are set in the north. There is no sunlight in daily life, and the utilization rate is not high. In the southern part of the house, the kitchen and bedroom are provided with light and warmth.

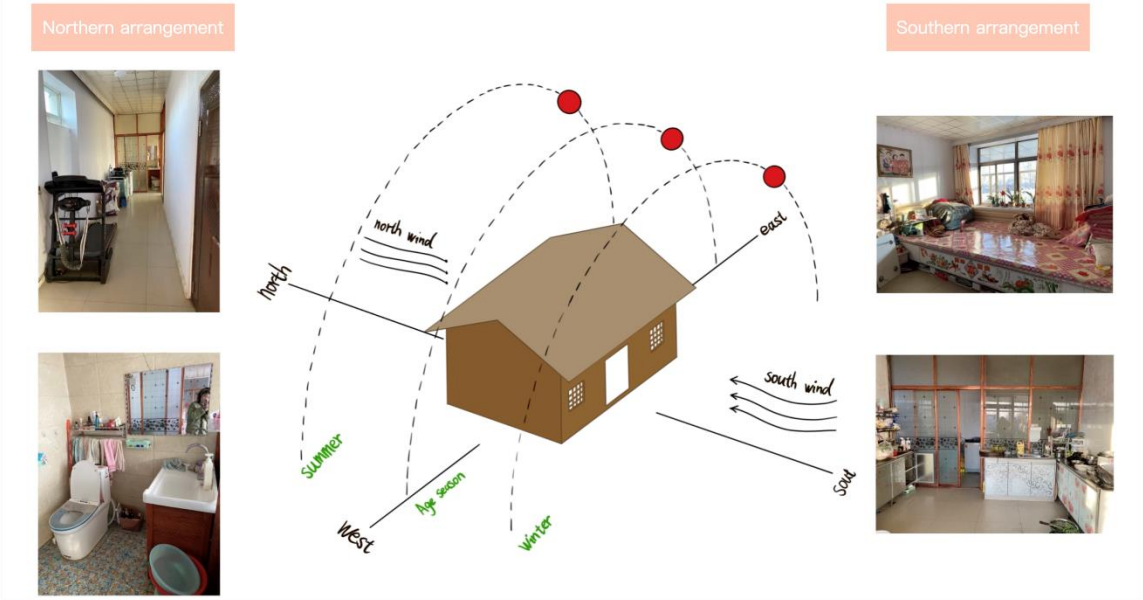

Figure 2

According to the data obtained by my investigation, it is sorted out and analyzed. As shown in Figure 3, the local residential buildings are regular cuboids, and the indoor planning is very simple. The sunroom is the main area to receive sunlight, relatively narrow; Heat from cooking in the kitchen warms the middle bedroom through pipes, simple heating measures; Put daily cleaning tools in the toilet, do housework route too energy consumption; The whole house has 2 bedrooms, one of which is unheated and cannot be used in winter. This configuration cannot meet the living needs of three generations of a family. Finally, the food prepared in the kitchen must be carried through long corridors to reach the dining place, which is very unreasonable planning.

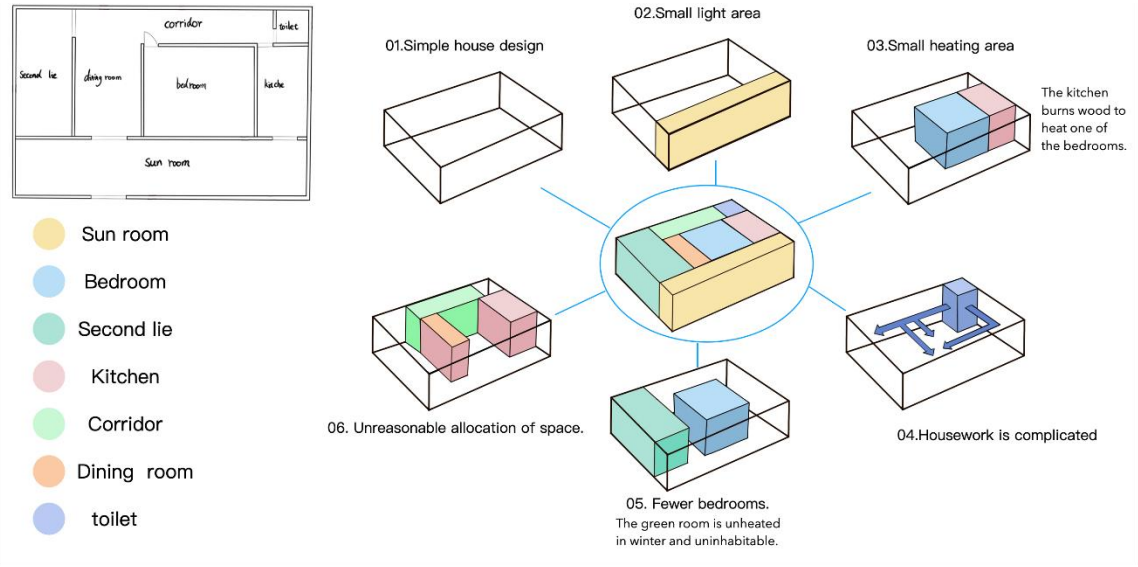

Figure 3

7) Environmental studies

Then I surveyed the local environment, as shown in Figure 4, and learned that the local terrain was high in the north and low in the south. With temperatures below zero degrees Celsius for five months of the year, heating homes is important; The sunshine duration is 2484.3 hours a year, which is lower than the national average level and belongs to the region with the least sunshine duration in China. As there is less sunshine, it is more necessary to make full use of the sunshine. Local rainfall is above the national average, so basic waterproofing is necessary.

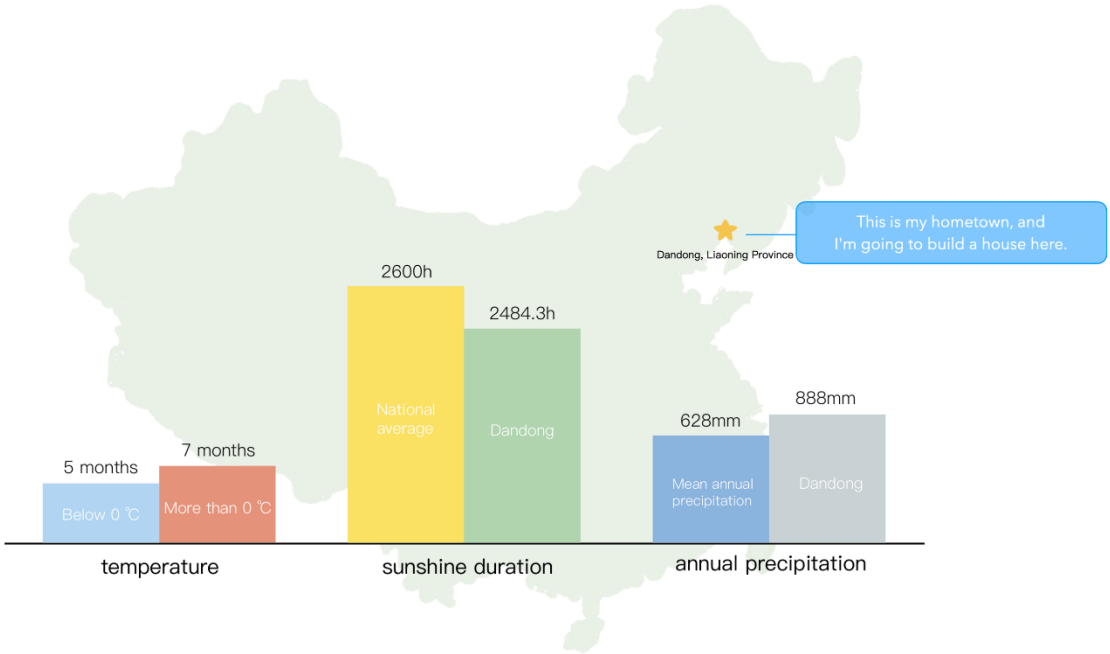

Figure 4

8) User research

Due to the influence of traditional Chinese culture, Chinese families emphasize family members living together. Common in China based on the three generations of the family live together in together "the trunk family type" (note) as the research object, figure 5 draws from now to the next 40 years, a trunk family facing important events, including the black dot represents the important moment, everyone in the family life at the same time also shows that the family home in the next 40 years will experience an important event.

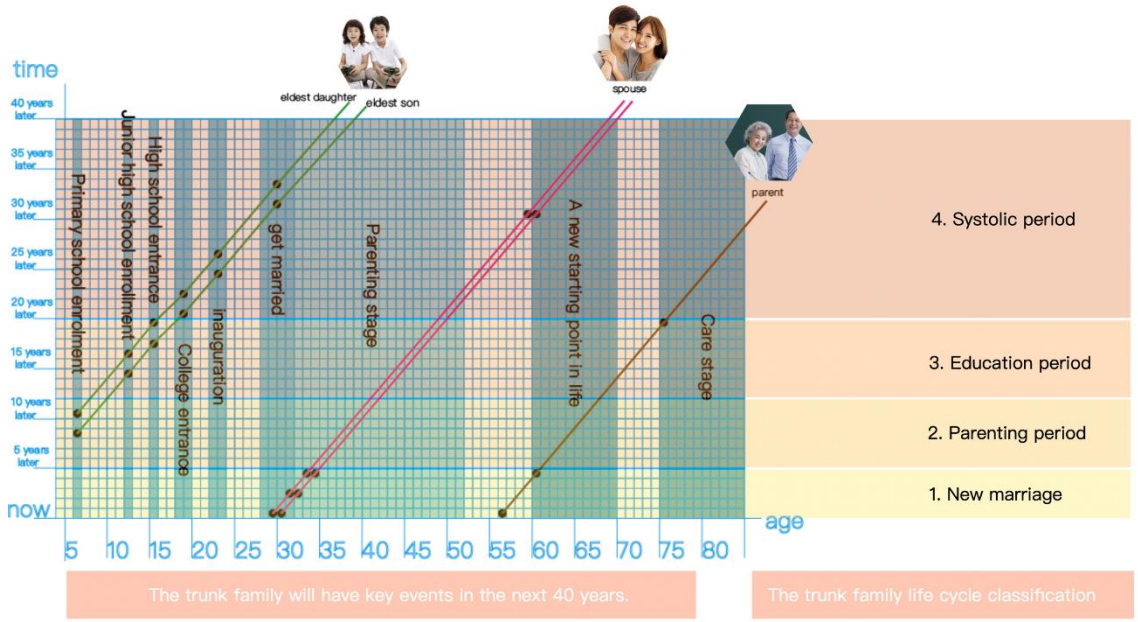

Figure 5

According to the research on the main stem families, the 40-year family life cycle shown in Figure 5 can be divided into four stages: a new marriage, child-rearing, education, and contraction. Among them, the demand for housing changes the most in the education period, and the demand for housing changes the least in the contraction period. I will incorporate the contraction period into the discussion of the education period.

According to the above research and analysis, how to make rural housing better meet the needs of the elderly, young people and children is the focus of my research this time.

4. Results

1. Residential design

In this part, I made a lot of design attempts, drew a lot of sketches for auxiliary design, and conducted case studies. The details are as follows.

1.1 Draft sketch

The first part is the sketch part. I started from the basic shape and tried to sketch with a cube and

triangle respectively. Along with the corresponding case study, it is better to choose the cube as the basic shape of this residential design, because the cube is simple in structure and easy to construct, which is suitable for local rural areas. See Figure 6.

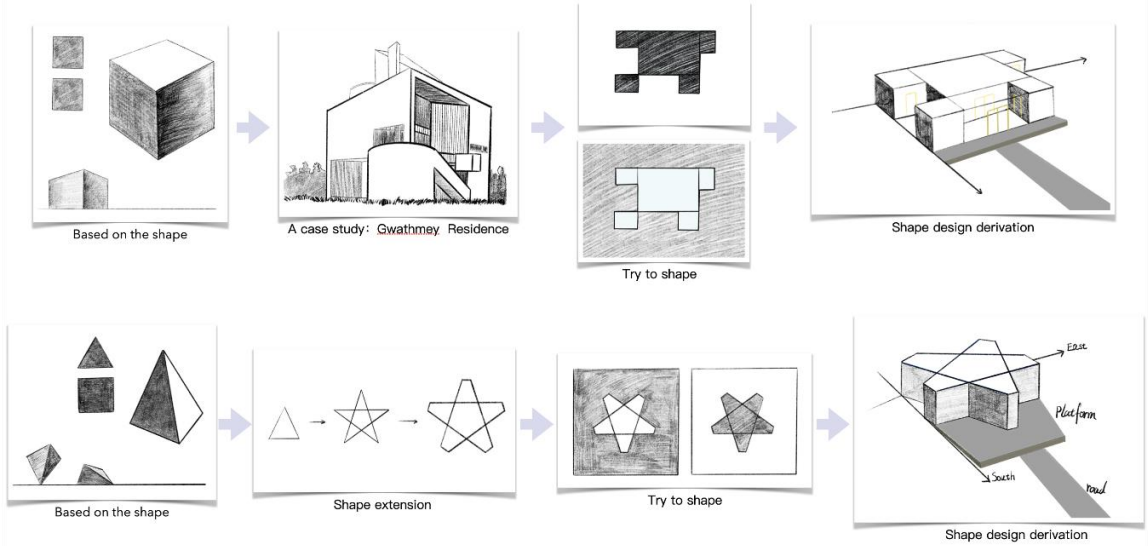

Figure 6

1.2 Conceptual model attempt

In this step, several equal-size cubes were made with cardboard, and then several combination attempts were made with cubes, as shown in Figure7. Finally, the third combination was selected, because the third combination was like the "H" shape, which was both scattered and concentrated, and could better meet the living habits of three generations of a family.

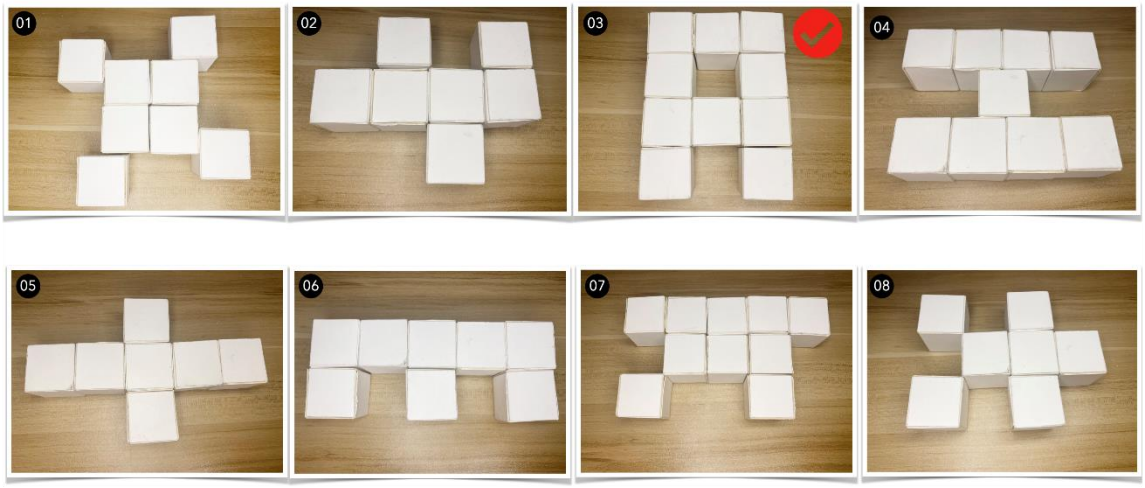

Figure7

1.3 Sketch presentation

Design and build a house on the land of 350 square meters owned by the household, as shown in Figure. 8. First, build a trapezoidal base according to the terrain, which can effectively prevent rainwater from infiltrating and changing the residential space. Then build a cuboid, which is the most familiar shape for local construction workers. The south side of the cuboid is recessed as the front door of the house; In the north part of the middle cuboid, an atrium is set to complement the light inside the house. The whole house is designed with a double sloping roof, which maximizes the preservation of light and heat. In the last part, trees were planted in the atrium to enjoy the cool in summer and not affect the lighting when the leaves fell out in winter. The entire house faces south and the sun rises in the east and sets in the west, while the back of the house still gets light.

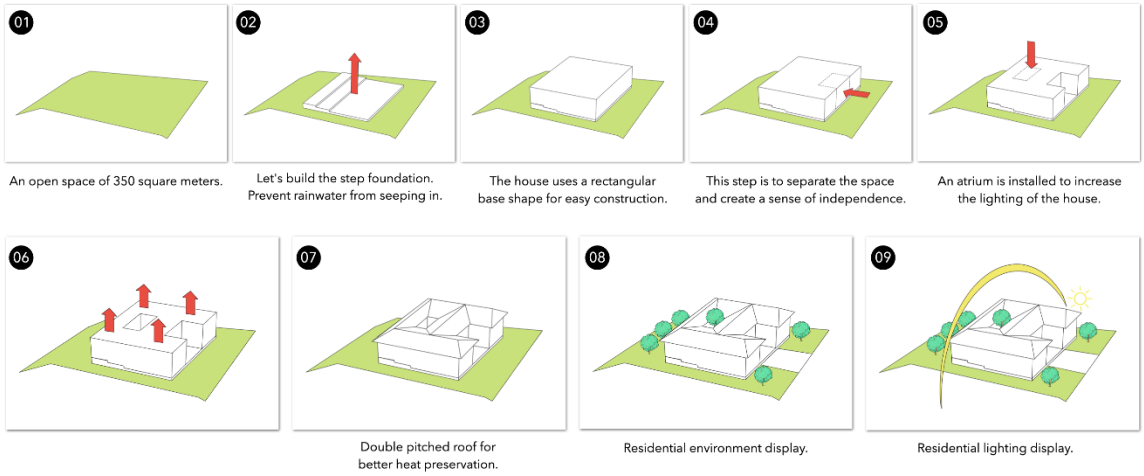

Figure.8

1.4 Exhibition of design sketch

In the last part of the residential design, the design effect is displayed. Firstly, the hand-painted effect of the overall residence is tried and practiced, as shown in Figure 9, which confirms the overall style of the residence, which belongs to the simple and natural style. After the overall effect of the house was determined, we began to study the internal construction structure of the residence, as shown in Figure 10. Based on the work of the above two parts, the drawing of the final effect drawing is started, and The final effect of the residential design is shown in Figure 11.

Figure 9: Sketch of residential design

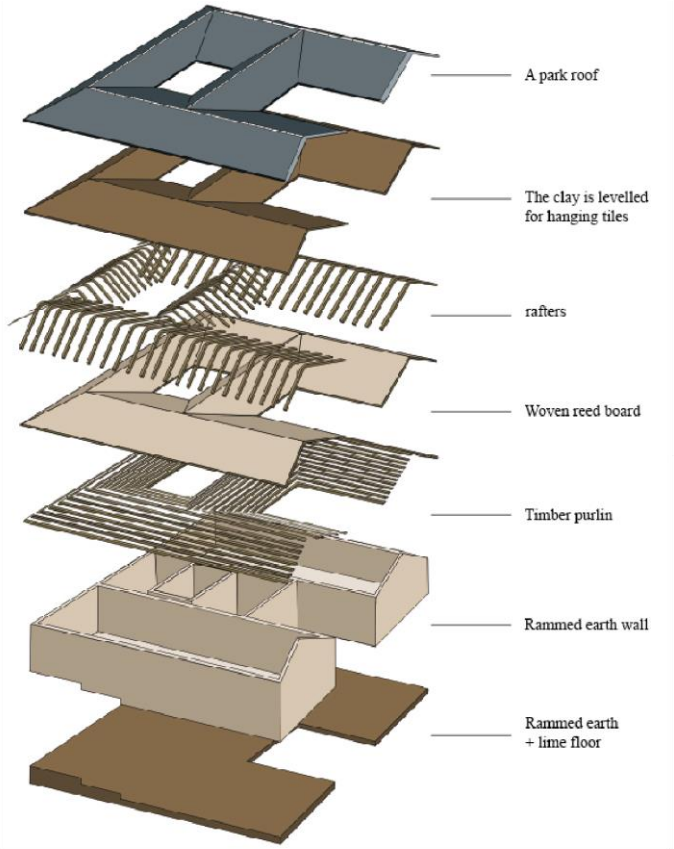

Figure 10: Study on residential Structure

Figure 11: Final rendering of the house design

1.5 Model making

As shown in Figure 12, WOOD is used as raw material and scaled down in a proportion of 1:360. The junction of the whole model is built with traditional Chinese mortise and tenon structure.

Figure12:Model show

2. Spatial planning and design

When the external design of the house was completed, I began to consider the interior space design of the house. Based on the timeline of 30 to 40 years that the main family in China had lived in the house, I designed different spatial changes according to the needs of the family in each stage. The following is the interior design.

2.1 Area planning

According to the relevant provisions of Chinese law, the area of self-built residential houses in rural areas is calculated according to the number of family population, and the area used by each person is 37.09 square meters. In our case, the maximum area of the house can be 222.54 square meters for a family of 6 people. (The atrium area is not included).

Similarly, Table 1 and Table 1 are the area reference of each space of self-built residential buildings stipulated by Chinese laws. This space planning follows these two tables.

Table 1 the recommended area standard for basic functional space of rural housing set by the Chinese government.

name	The hall	The living room	The master bedroom	Second bedroom	The restaurant	The kitchen	Basic storage room		toilet
Area (m2)	3-5	14-30	12-18	8-12	8-15	6-10	The number of	With a total area of	4-8
							2-4	4-12	

Table 2 is the recommended area standard for auxiliary function space of rural residential buildings set by the Chinese government.

category	Living additional function space							
name	hall	The study	Housekeeping room	The balcony	The guest rooms	The gym	Sun room	The courtyard
Area (m2)	16-30	10-16	8-13	4-8	12-15	14-20	8-12	Area size according to actual demand

2.2 Spatial arrangement attempt

First, I made cards representing each room in proportion, and then I tried to combine the space with these cards many times. See Figure 13.

Figure 13

2.3 Family life cycle1: New marriage

The new marriage period is relatively short, about 1 to 5 years, this stage of the family members are an old couple and young couple 4 people, life must need: 2 bedrooms, kitchen, dining room, living room, toilet. The age difference between the two generations is about 25 years, life is very different, and values are different. Therefore, this part of space planning mainly considers how to make two generations live more independently in one space and reduce interference with each other.

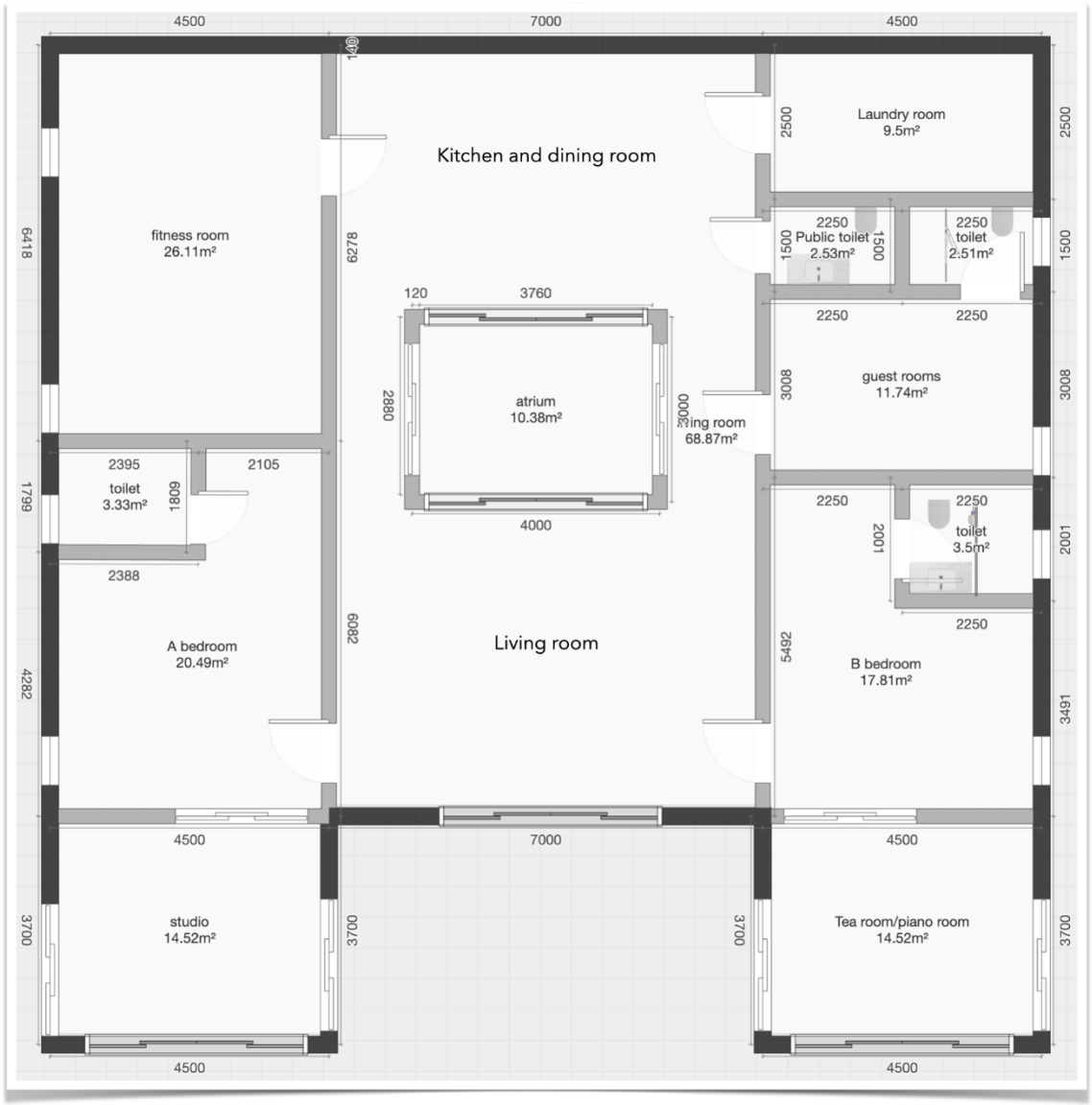

Figure 14

Figure 14 shows the spatial planning at this stage.

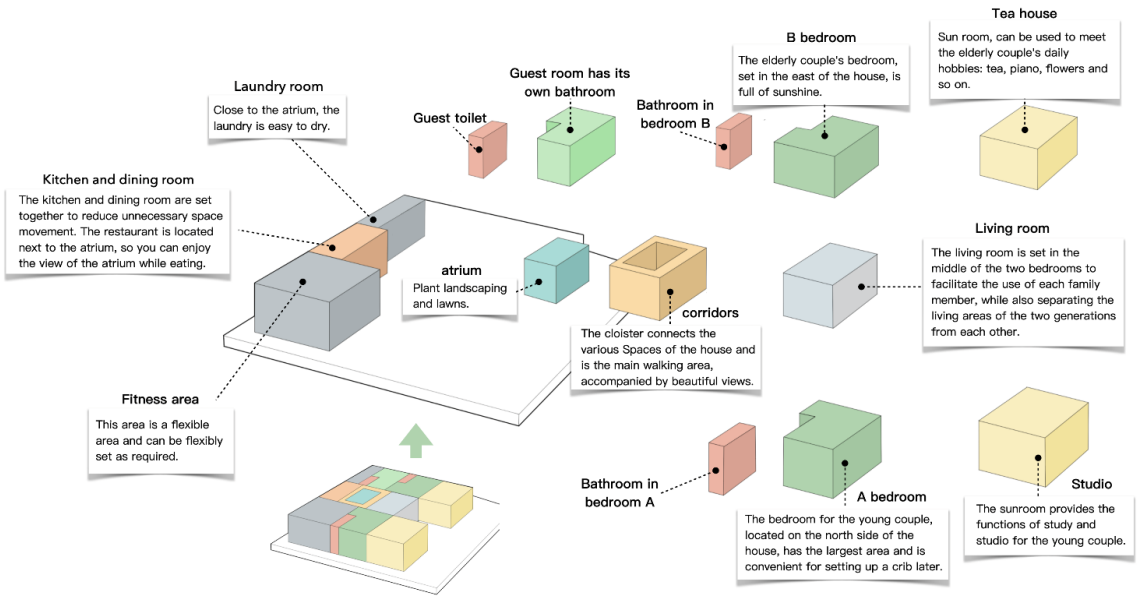

Figure 15

Figure 15 shows the reason and purpose of such planning for each space.

2.4 Family life cycle2: Parenting period

The child-rearing period is the period with the largest number of family members. With the birth of two children, the family members become six. The parenting period refers to the period from birth to primary school, which is about 5 to 11 years later. During this period, children need their parents' company very much. They live in the same room with their parents and have high energy. Children's living and playing areas are set on the west side of the house to avoid disturbing the rest of the elderly.

Figure 66

Figure 16 shows the spatial planning at this stage.

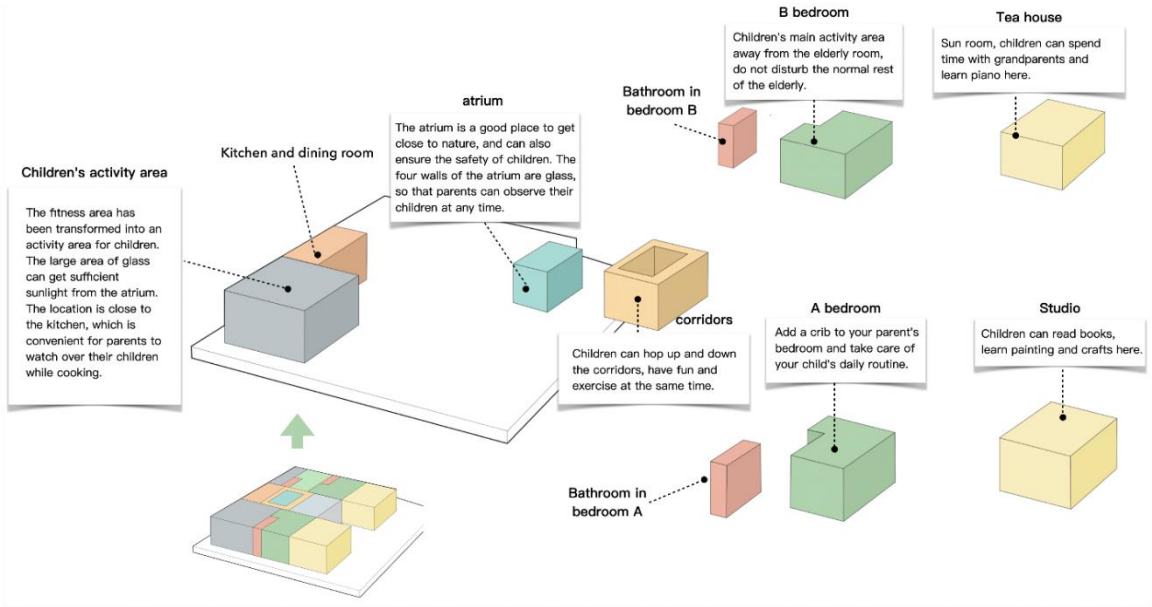

Figure 17

Figure 17 shows the reason and purpose of such planning for each space.

2.5 Family life cycle3: Education period & Systolic period

The last stage is the educational period of the family and systolic period, children enter student time in turn, the space that needs oneself will learn life, this stage divides children activity area for two bedrooms, add two toilets among, become the room of children oneself. Figure 18 shows the spatial planning at this stage.

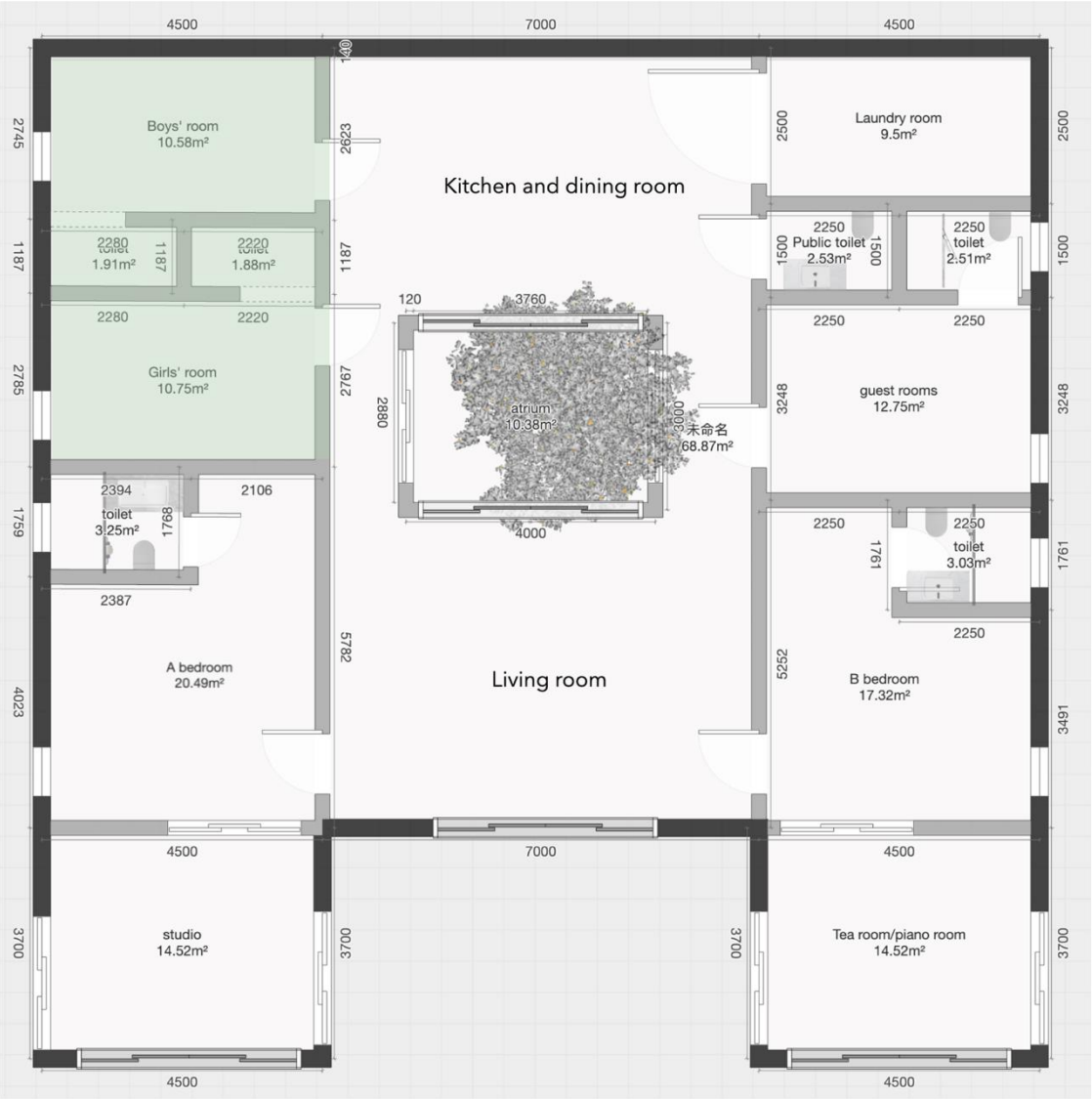

Figure 18

Systole is mainly reflected in the death of the elderly in the family and the children grow up to go to college and work in other places. The children go out to work and study, but keep their room at home. The timing of the old man's death is uncertain. So the systolic residential space basically won't produce too big change, here will not discuss the systolic situation alone.

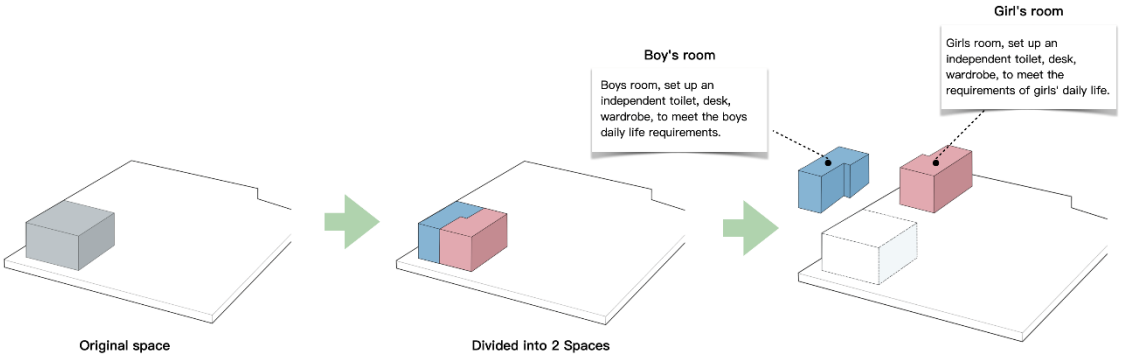

Figure 19

Figure 19 shows the reason and purpose of such planning for each space.

5. Discussion

In this paper, the regional characteristics of the Dandong Donggang district are fully considered, and the theory of the family life cycle is combined to design a set that can meet the comfortable life of residents. At the same time, the different residential space needs generated by different life cycles are merged. Make full use of solar energy, and increase the area of sunlight to improve the thermal environment. The design of residential space adopts the form of large space and multiple partitions to meet the possibility of changing space.

6. Conclusion

The goal of my design is to design a house suitable for three generations of a family. In residential design, how to maximize and more environmentally friendly warmth in cold weather needs further research.

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