GRADUATION THESIS
DEFENSES

Smart Senior Care

Age-appropriate space design

SMART SPACE DESIGN FOR THE AGED

Smart old-age care is mostly focused on the use of all kinds of equipment, and the impact on living space is less studied. However, the living space has a great influence on the elderly. This design is to explore the influence on the living space design under the smart pension system from the perspective of

technology

TUTOR: Professor Luca Guerrini
STUDENT:Liu Fulin
2022/10

Index .__

01. RESEARCH

Context Analysis
Definition of Basic Concepts

02. DISCOVERY

The Impact of technology
Changes in design factors

03. DESIGN

Study On Residential Module
The Material Strategy
Lighting Strategy

The old

There are a lot of old people

OVERVIEW

Smart old-age care is mostly focused on the use of all kinds of equipment, and the impact on living space is less studied. However, the living space has a great influence on the elderly. This design is to explore the influence on the living space design under the smart pension system from the perspective of technology

>7.2
a hundred million

Number of old people worldwide

According to the World Bank, the total number of people aged 65 and above exceeded 700 million for the first time in 2020.

>2.64
a hundred million

Number of old people in China

Data from the seventh national census show that China´s elderly population exceeds 200 million.

>3.62
a hundred million

the Chinese wisdom pension market scale

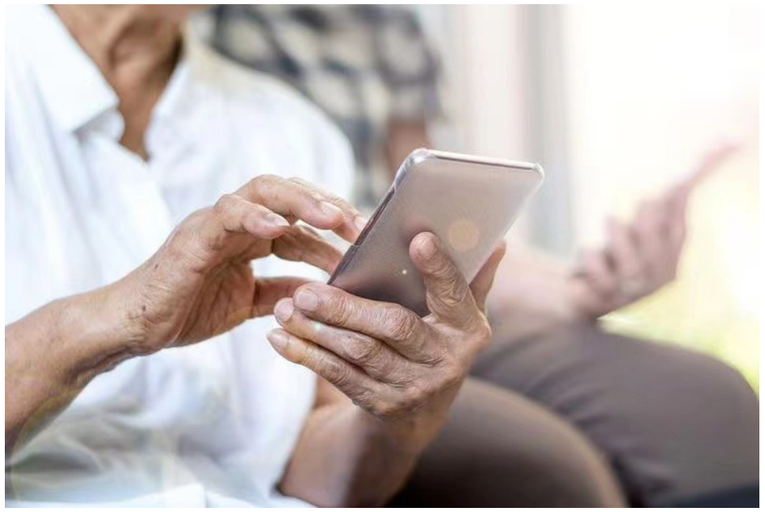
In 2020 the Chinese wisdom pension market scale is more than 3.76 trillion yuan.

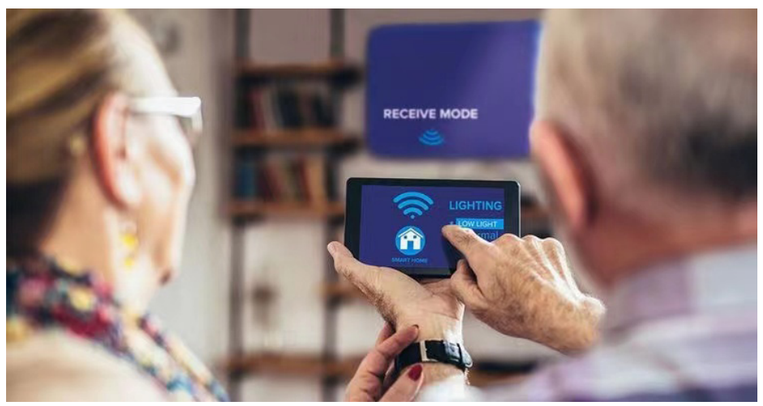
<5
piece

Number of papers related to intelligent old-age care and space design

There are few papers and studies on the relationship between smart old-age care, smart technology and residential space design for the elderly

SMART SENIOR CARE





The predecessor of the concept of Smart Senior Care is Smart Home Care, which was first proposed by the British Life Trust, and is also known as the "fully intelligent elderly system".

It refers to the use of advanced information technology means to carry out iot, interconnection and intelligent elderly care services for the elderly at home, so that the elderly can live a high-quality and enjoyable life in their own homes without being restricted by time and geographical environment in their daily life. Its core lies in the use of advanced science and technology

Smart technology

Used For Intelligent Old-Age Care

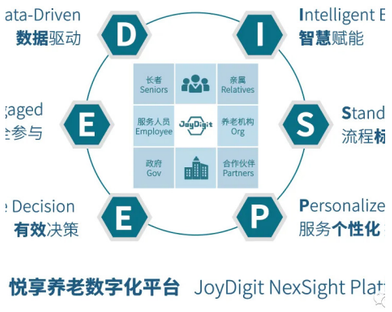
With the combined use of smart technology, computers can help humans make more appropriate decisions. This is of great significance for the elderly whose thinking ability, reaction ability and physical function have been greatly decreased, which can effectively avoid the possibility of the elderly making wrong decisions due to their own ability degradation and reduce the occurrence of tragedies.

The Internet

The Internet integrates the resources for the elderly, lets the service providers know the needs of the elderly in the most convenient way, and improves the service efficiency of the service institutions for the elderly.

The Internet of things

Through various sensors, the Internet of Things accurately monitors the state of the elderly and responds to some of their needs immediately.



Smart Senior Care system

It combines the Internet of Things, Internet, cloud computing, big data, blockchain and other technologies to become a cloud management platform.This is the most widely used part of China´s smart pension industry.

Impact

Used For Intelligent Old–Age Care

Design focus shifts

Design concerns and key reference factors change.From the original human behavior, human scale as the basic factors to the principle of machine work as an important factor

Spatial interaction mode changes

From the active interaction based on people´s subjective feelings, to a more intelligent and passive interaction.

A break from previous design constraints

Due to the limitation of human scale or behavior, many designs could not be realized when human factors were used as the main influencing factors of space design in the past.

Changes to the details of the space design

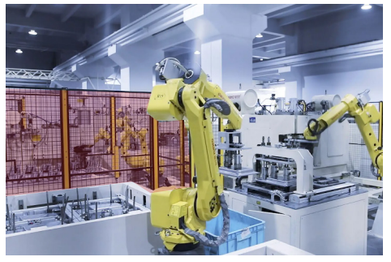
SEE

Seeing is transformed by the human eye into signals and pictures recognized by machines. Machines watch and make decisions instead of humans

THROUGH

With ergonomics as the main reference standard in the past, and machines as the main labor force, ground flatness, have become more important

SUPPLY



When humans are the main labor force, they need air, food and light. When the machine is the main reference, more charging locations and less signal blocking are needed

Internet

Used For Intelligent Old-Age Care

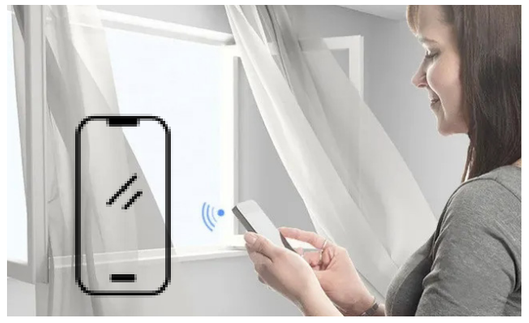
HUMAN ACTIONS —— AUTOMATION

The operating scale of human body is not used as a window reference.There are many other factors, of course, that are no longer deterministic on a human scale.

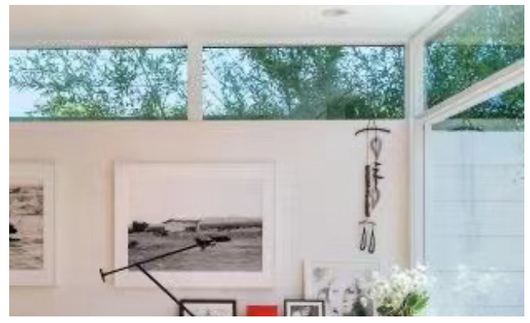
Design focus shifts

The window is reserved for operation space

Open Windows at appropriate locations



Free up window space



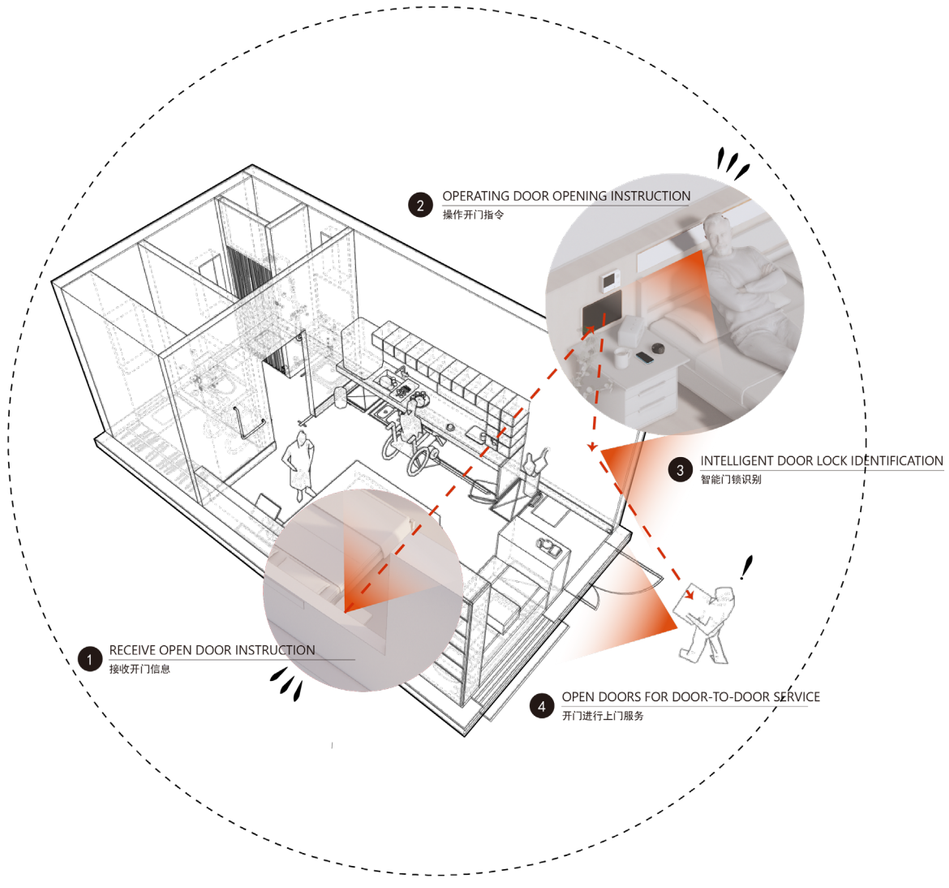
The placement of Windows becomes diverse

Living space for the elderly

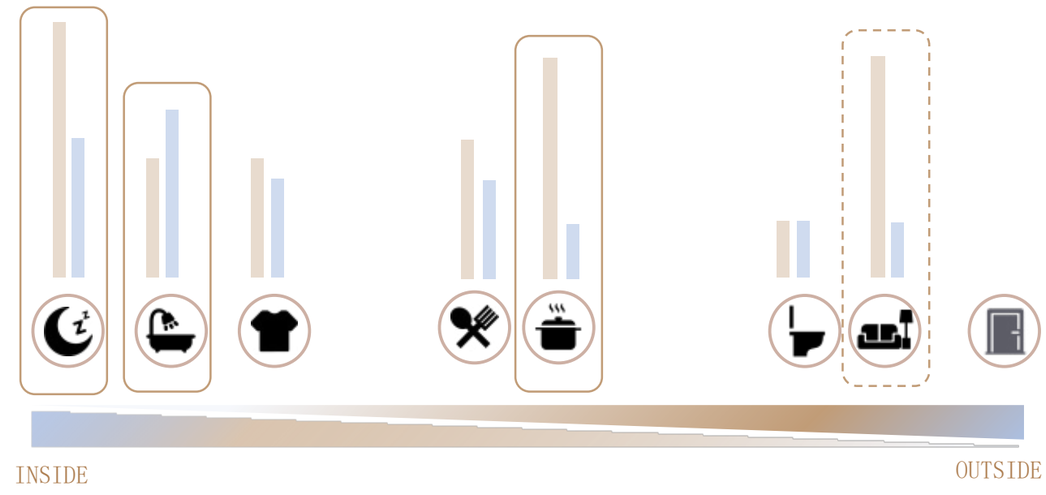
The Internet connects various control devices, and the elderly do not have to do many things by themselves, which reduces the probability of danger for the elderly

Internet_
Space control system_

Design focus shifts



Design focus shifts

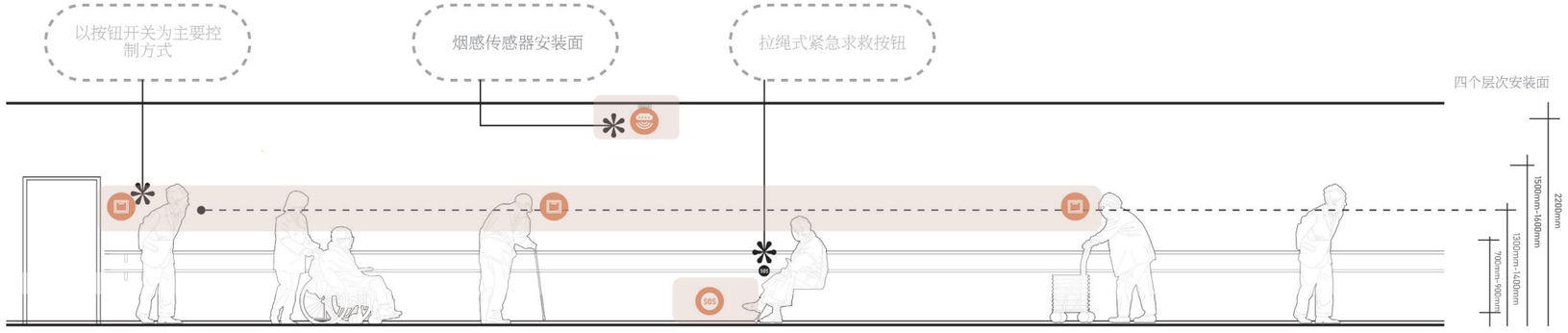


Choose to set the entry control system in the long stay time, slow movement, far away from the door

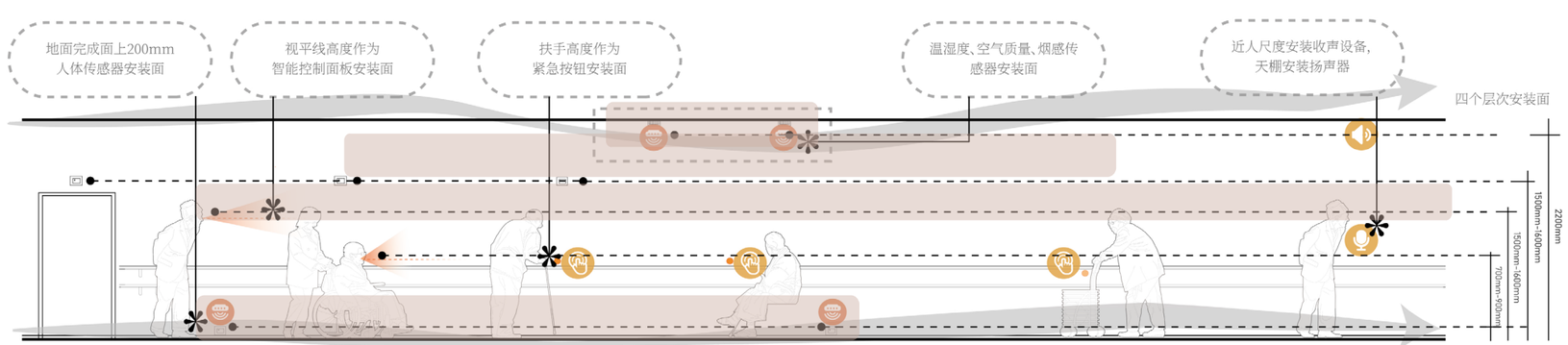
The space control system was changed from the original hands-on operation to remote operation. The consideration of the point position of the control equipment is gradually changed from decentralized to centralized.

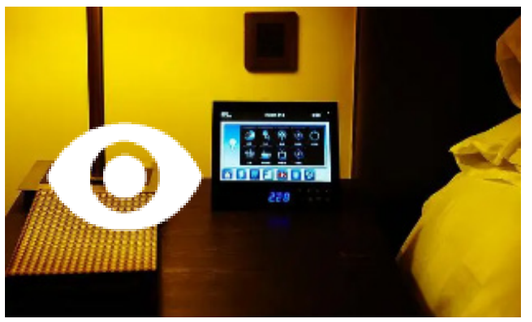
Internet_Space control system_
Changes in facade design

Easy to operate as the main reference



Viewing requirements are incorporated for reference





The Internet of things

The way of spatial organization is affected by the specific use of the Internet of Things

Infrared sensor

Infrared sensors will be blocked by building partitions. If infrared sensors are used as security detection for the elderly, many small Spaces need to be divided and many sensors used.

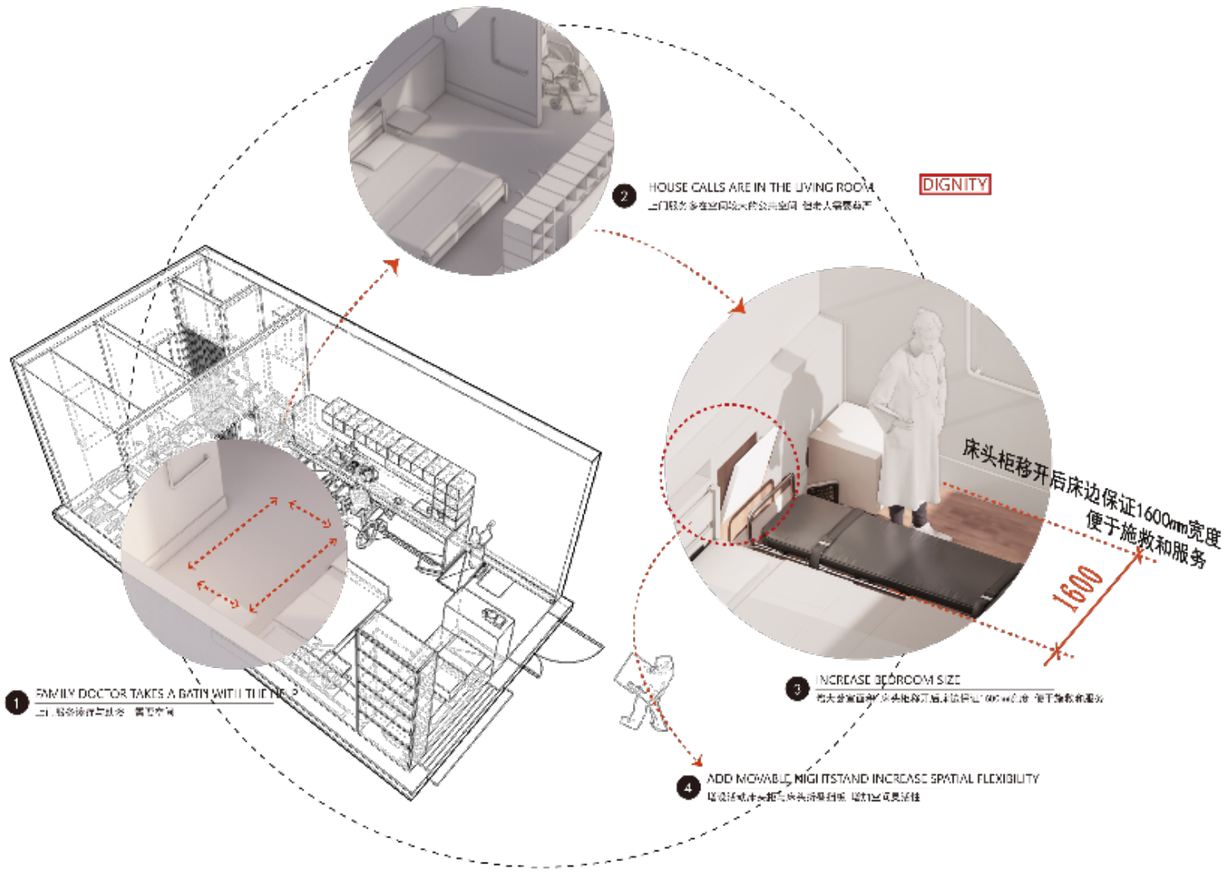
Floor pressure transducer

The floor pressure sensor can be spread throughout the space, which may cause an open space and complete spatial organization

Smart pension system

Smart old-age care is mostly focused on the uace design under the smart pension Smart old-age care is mostly focused on the uace design under the smart

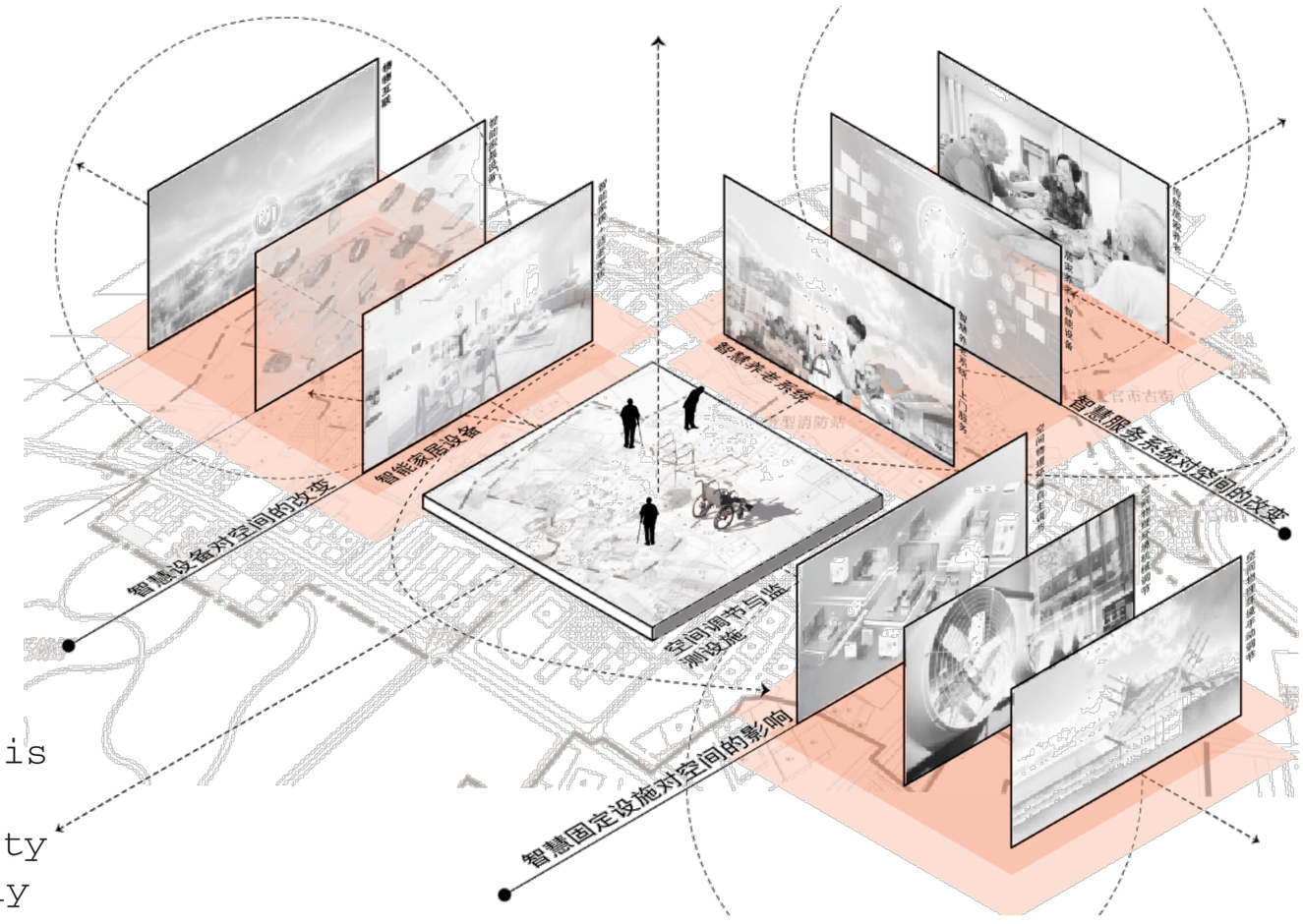
Space Resource Allocation



All KINDS of door-TO-door service are carried out in the larger area of the living room, will tell to the old man is very undignified situation.

In the face of door-to-door service, interior space may consider reallocation

Possible influence aspects



Design Focus Shifts

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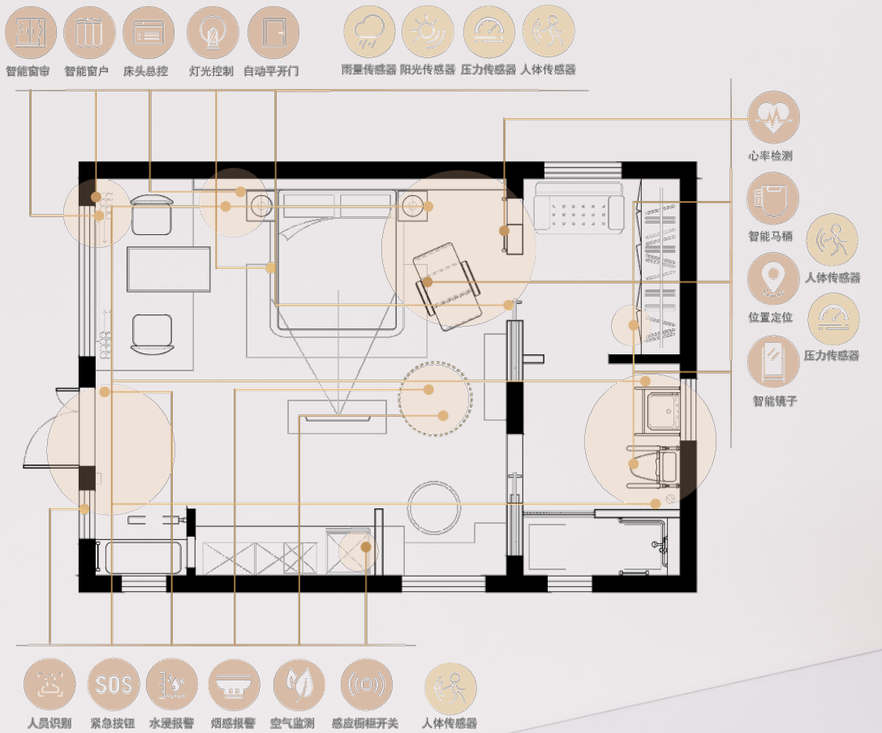
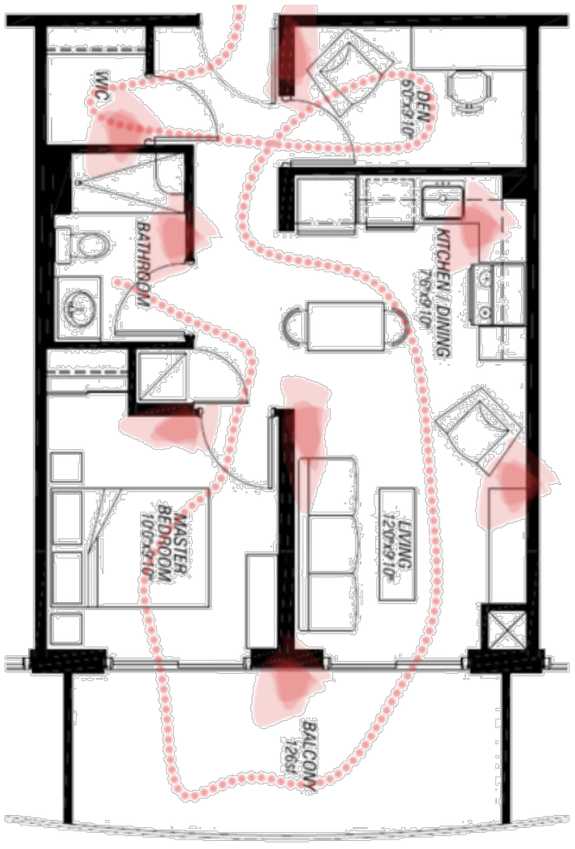
12.

Intelligent aging module design



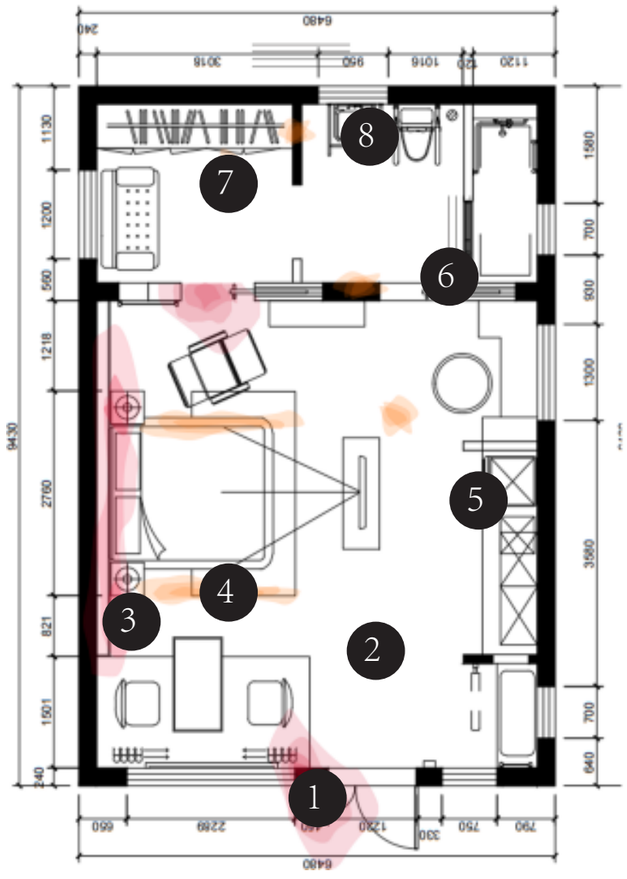
Safety protection strategy

Conventional space control



Scattered_

Intelligent space controlcontrol



- Home security system
- Non conscious sensor
- Pressure floor fall detection
- Induction door
- Bedside control system
- Static monitoring system
- Induction night light
- Emergency call system

SCompared with before, the number of points that need to be controlled artificially is smaller and more concentrated. The number of passive monitoring points is increased, and intelligent technology is used to make intelligent scientific decisions for the elderly

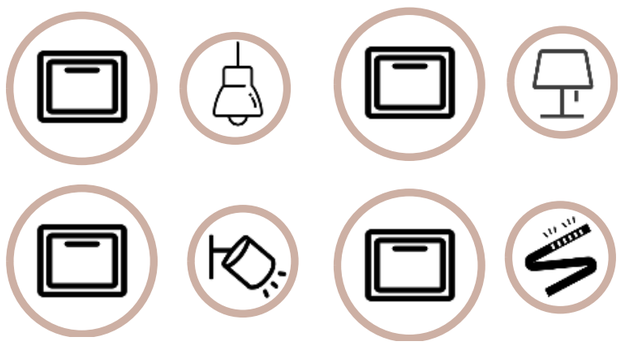
Concentrated_

Spatial interaction strategy

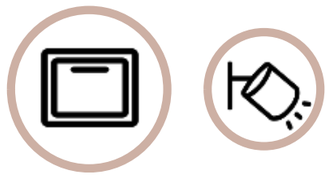
When the viewing demand is greater than the operation demand, the viewing screen is opposite to the bed body, and there is no need to get up when viewing, which is convenient for the user to watch.

LIGHTING SCENOGRAPHY

Instead of controlling a single light with a single button, it now automatically adjusts the light according to the time and illumination of the interior space

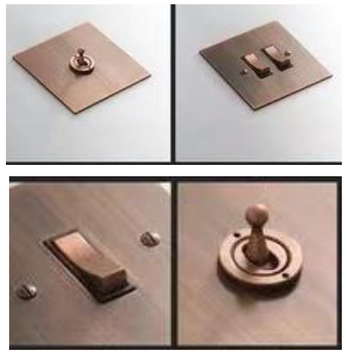


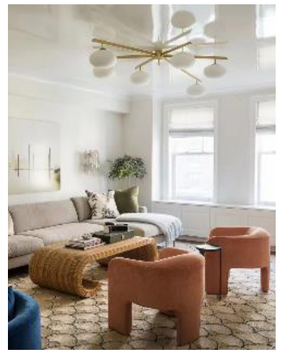
One button one luminaire



one button one class luminaire

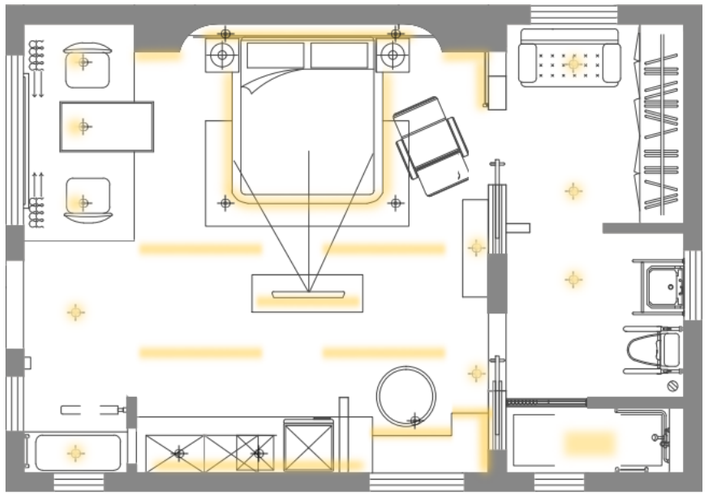
One button one scenario

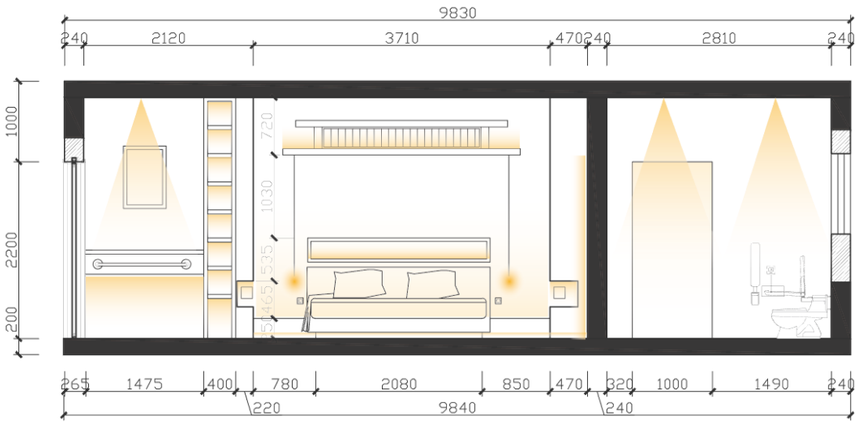


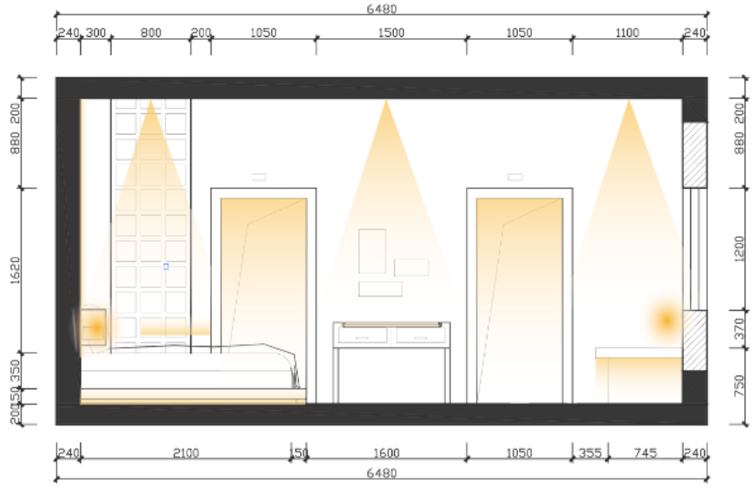


Monitoring time and indoor lighting environment,Intelligent adjustment of indoor artificial lighting conditions, low-carbon environmental protection while improving the safety of the elderly

LIGHTING SCENOGRAPHY







Night mode

sleep mode

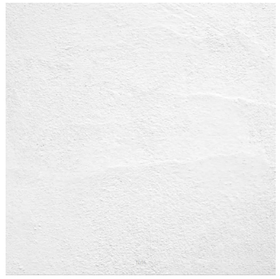
middle of night mode

SIGNALS LIKE THE AIR

Access to smart devices and systems makes electricity and signals as important as air. Commonly used building materials will have attenuation effect on signals, which will be considered as an important factor when selecting materials in the future

Table of material penetration loss values

Materials	penetration loss(dB)	Maximum allowable
WOOD	5	5
PLASTIC	5	5
GLASS	5	5
synthetic material	5	5
MARBLE	10	2
CONCRETE	14	2
METAL	17	1




Choose materials with weak signal attenuation: wood, plastic,

synthetic materials, glass, etc

Gong lu. Research on the influence of wall on WiFi signal transmission [J]. China new communications,2020,22(17):55-56.


再也不用起身开关灯了，侧头
可视控制面板。
设置与床头正对的取景，老人
无需起身，侧头即可控制

THANKS

TUTOR: Professor Luca Guerrini
STUDENT:Liu Fulin
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MILANO 1863