

Super Sensory iOffice

超感办公空间

iSpace Team

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同济大学
TONGJI UNIVERSITY



acatech
NATIONAL ACADEMY OF
SCIENCE AND ENGINEERING



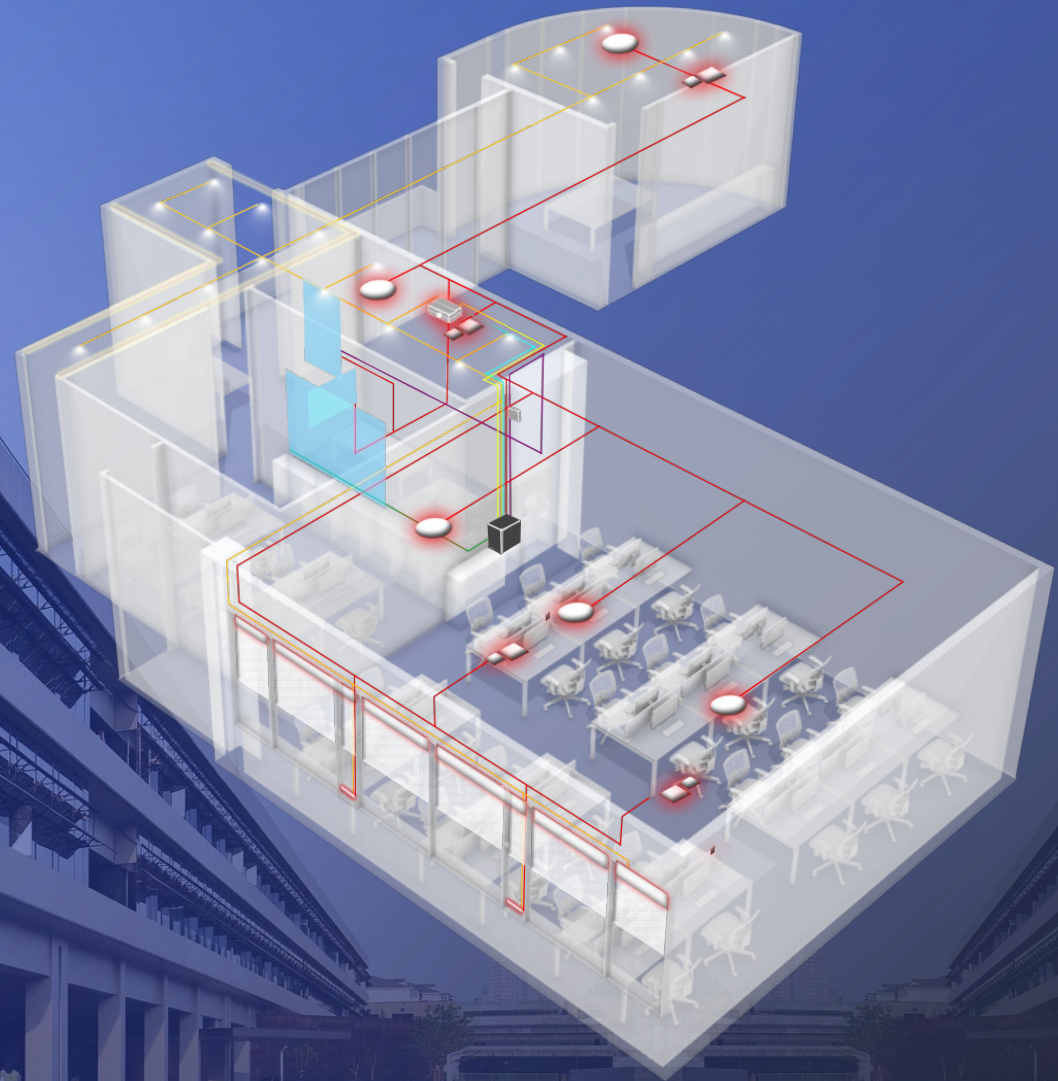
IVA
ROYAL SWEDISH ACADEMY OF ENGINEERING SCIENCES

Super Sensory iOffice

Tongji University Architectural Design & Research
Institute (Group) Co.
同济大学建筑设计研究院(集团)有限公司

📍 No.1230 Siping Road, Yangpu District, Shanghai

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Super Sensory iOffice

Enhance office utilization efficiency and reduce management costs

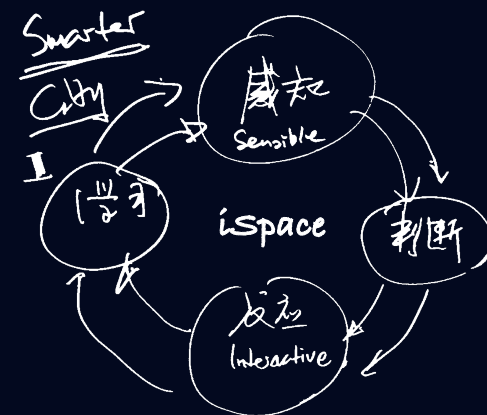
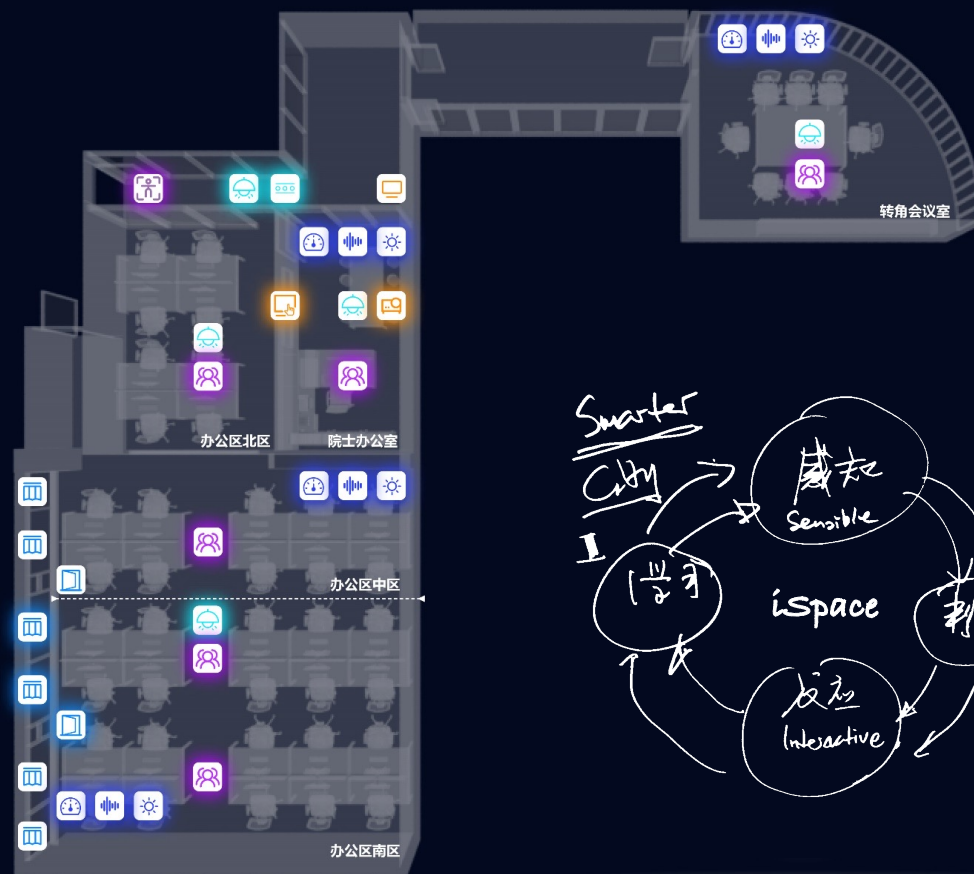
提高办公室利用效率，降低管理的成本

Environmental monitoring and automatic adjustment to improve office comfort

环境监测与自动调节，提升办公舒适性

Reduce energy consumption and carbon emissions

降低能耗、减少碳排，用电智能化管控



Question 1: Wastage of Hot Desk

问题一：工位浪费

Hot desks are only utilized **30%** of the time,
with the remaining **70%** going to waste

本以为需求较高的灵活工位在改造前仅30%在使用，而70%的灵活工位在浪费

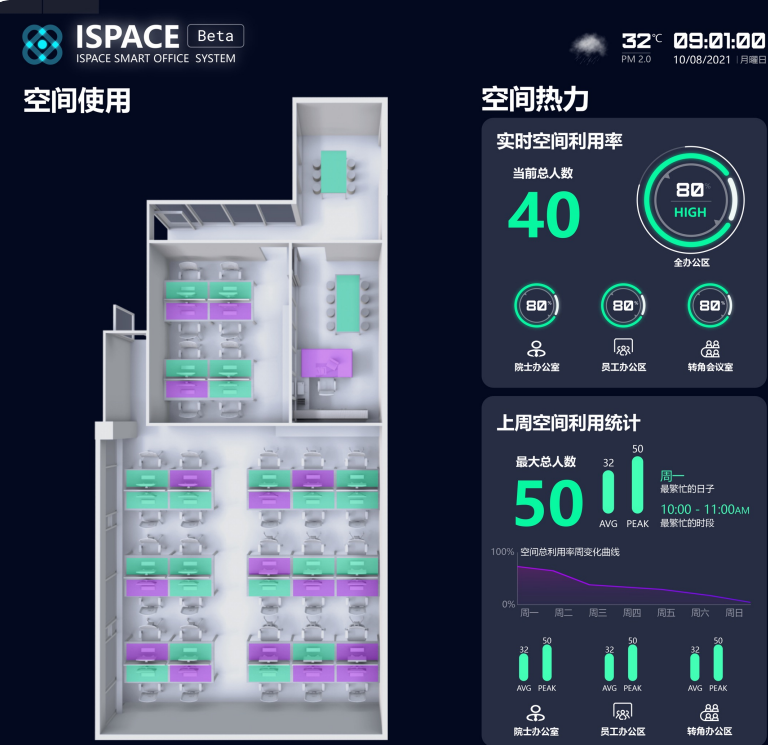
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Creating Value

The rental value of a single workstation in
Yangpu District is **1,000** yuan per
unit monthly.

上海杨浦区为例，单个工位的租金价值在1000元/个



Question 2: Poor Environment

问题二：环境不佳

Due to poor indoor odors caused by piping and decoration, the complaint rate among staff is as high

as **96%**

因为管道、装修造成的室内气味不佳导致工作人员投诉率高达96%

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Improve
work efficiency

75% of employee negative emotions are caused by the air environment. Good air quality can

improve work efficiency by **30-50%**

每天75%的情绪都是由空气环境引起的
工作效率能够提升30-50%

Question 3: Excessive Electricity Consumption

问题三：能耗过高

Lights in indoor passageways, reception areas, rest areas, meeting spaces, and other public spaces are

often left on, unused **70%** of the time, leading to an additional monthly electricity cost of

1,200 yuan.

室内通道空间、接待空间、休息空间、会议空间等公共空间灯光常开，70%的时间是没有人使用的，每个月要多花电费1200元

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SUSTAINABLE
DEVELOPMENT GOALS



Carbon
Reduction

Saving 1 kWh of electricity equals a reduction of

0.997kg CO₂ emissions.

If air conditioner automatically adjusts its temperature, it

can reduce emissions **1100kg** annually

节约1度电=减排0.997千克CO₂

一个房间内空调自动调整温度，则一年可减排预计1100千克

院士办公室 智能场景

日常模式

会议模式

观影模式

休息模式

办公模式

离开模式

智慧照明&交互

投影触摸屏幕

智能沉浸观影

柔和亮度照明

智慧办公照明

设备自动关闭

6类设备

8类设备

7类设备

6类设备

6类设备

4类设备

设备情况

筒灯

音箱

投影仪

触摸屏

环境感知

人数统计

光线感知

噪音感知

设备状态 ON

设备状态 OFF

设备状态 ON

设备状态 ON

设备状态 ON

设备状态 OFF

设备状态 OFF

设备状态 OFF

CGD-LD1003R-01

XIAOMI Sound

ACER P155Ki

红外电容触摸框

W16

V5121-470M PN

WS202

WS302-470M

走廊接待区 智能场景

欢迎模式

常规模式

下班模式

灯光随行人流动|语音智能交互|屏幕展示

智能感应灯光|智慧平台UI界面展示

设备自动关闭|智慧节能

7类设备

5类设备

3类设备

设备情况

筒灯

音箱

话筒

流线灯

智能大屏

环境感知

人体感知

设备状态 ON

设备状态 OFF

设备状态 OFF

设备状态 ON

设备状态 ON

设备状态 ON

设备状态 OFF

CGD-LD1003R-01

XIAOMI Sound

DS-65VA3008/U

富士COB灯带24V

浪潮科技-55寸

W16

TI IWR6643ISK

团队办公室 智能场景

常态模式

防西晒模式

离开模式

智能环境调节|工位人数统计

西晒时窗帘自动调节室内光照强度

设备自动关闭|智慧节能

8类设备

7类设备

4类设备

设备情况

筒灯

窗帘

开窗器

人数统计

环境感知

光线感知

噪音感知

设备状态 ON

设备状态 OFF

设备状态 ON

设备状态 OFF

设备状态 ON

设备状态 OFF

设备状态 OFF

CGD-LD1003R-01

DOOYA

BECKS-48S

V5121-470M PN

W16

WS202

WS302-470M

转角会议室 智能场景

日常模式

会议模式

无人模式

智能投影交互|智慧演示

设备自动关闭|智慧节能

设备自动关闭|智慧节能

6类设备

4类设备

4类设备

设备情况

筒灯

音箱

智能大屏

环境感知

人数统计

光线感知

噪音感知

设备状态 ON

设备状态 OFF

设备状态 ON

设备状态 ON

设备状态 OFF

设备状态 OFF

设备状态 OFF

CGD-LD1003R-01

XIAOMI Sound

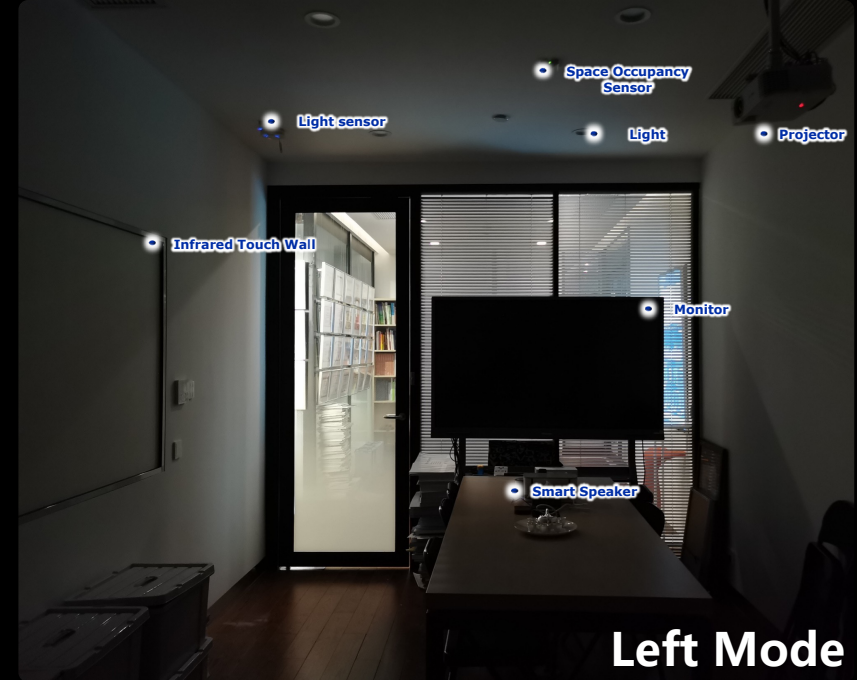
浪潮科技-55寸

W16

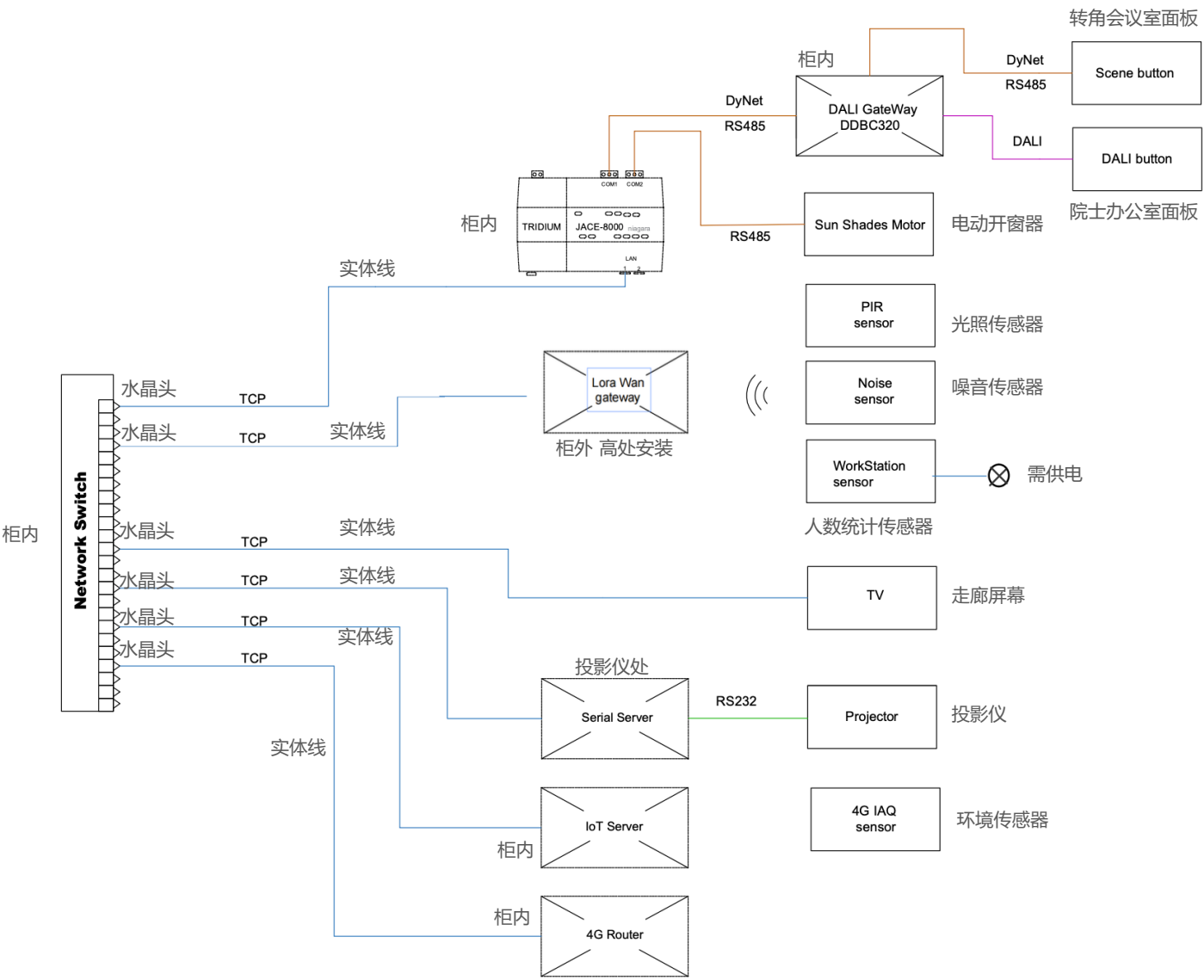
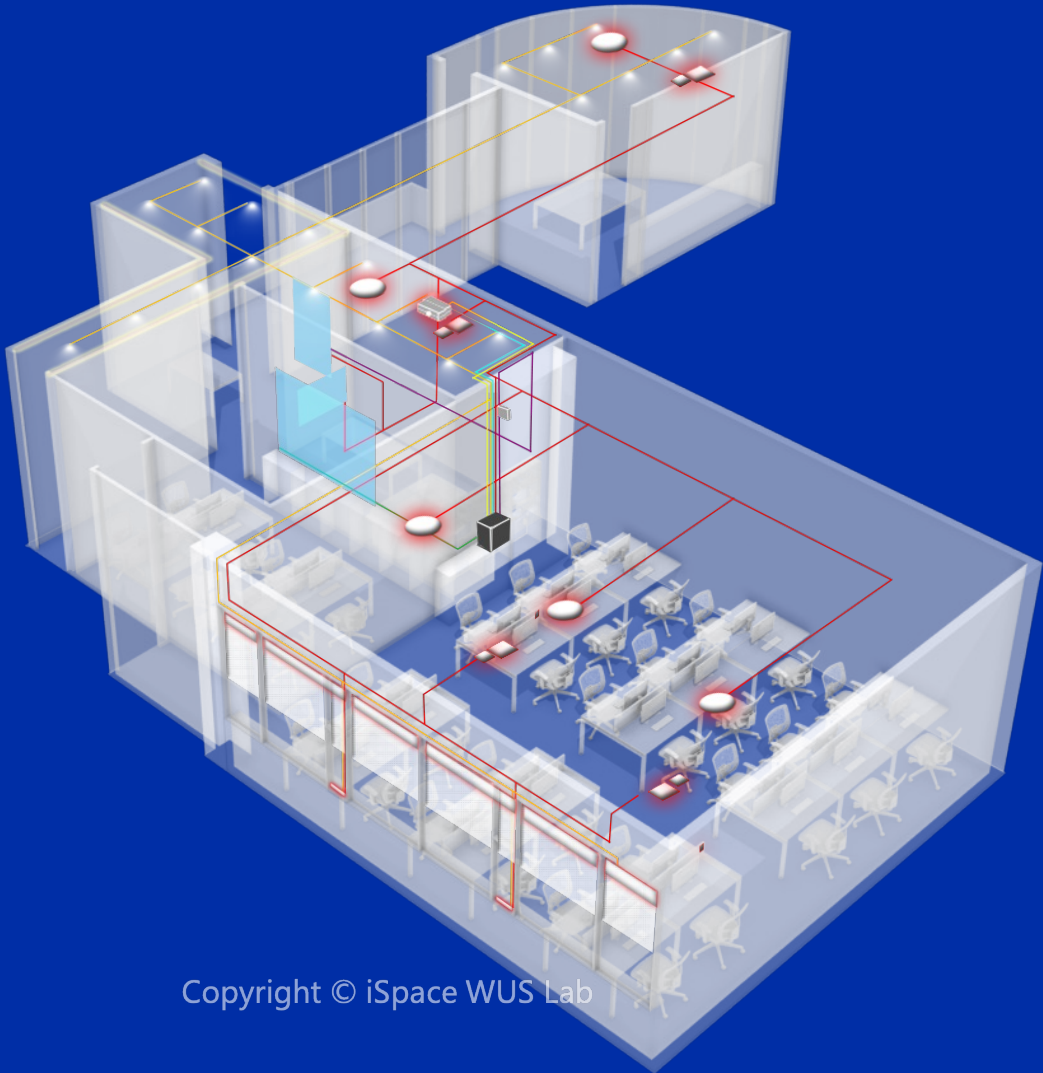
V5121-470M PN

WS202

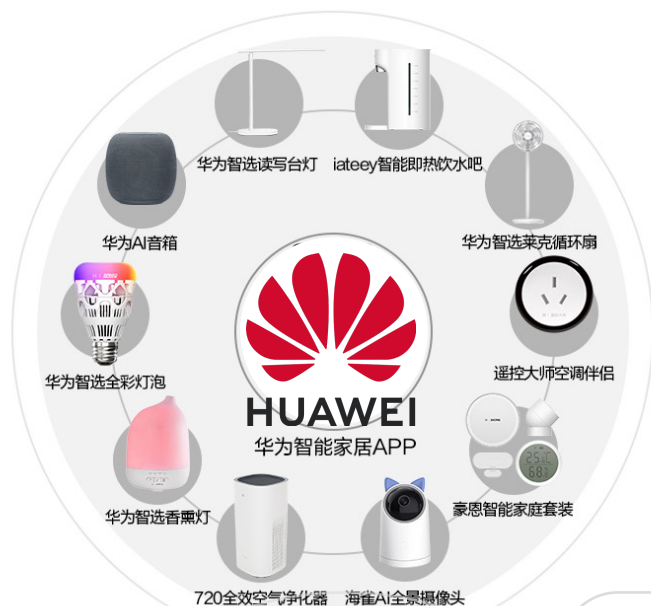
WS302-470M



Space IoT Network Schematic



Industrial-Grade Integrated Control Platform



Private Homes

VS

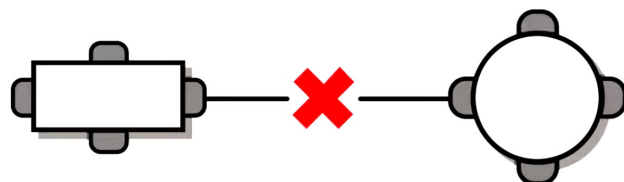
Public Office

- Closed Ecosystem
- Limited Number of Devices
- 独立生态体系 (Independent ecosystem)
- 设备数量可控 (Device quantity controllable)
- 私人范围使用 (Private range use)
- 容错空间宽泛 (Wide margin for error)

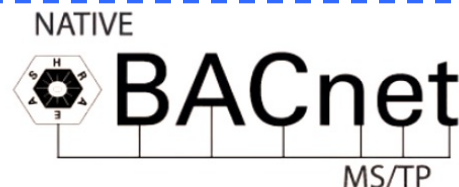
- Universal Standards、Multi-type Integration
- Low-Cost Operation and Maintenance
- 通用标准 平台化联通 (Universal standards, platformized connectivity)
- 大型设备 多类型集成 (Large equipment, multi-type integration)
- 多人公用 低成本运维 (Shared by multiple people, low-cost maintenance)
- 精准稳定 安全性底线 (Precise and stable, safety bottom line)



International Standard System



建筑物联最大痛点 设备自成体系无法通讯



BACnet (楼宇和控制网络)

global standard for automation and control networks

自动化和控制网络的全球数据通信标准



建筑智能化的国际标准 BTL认证

ISO16484 - 楼宇自动化和控制系统 (BACS)

Building automation and control systems

Part 1 Project specification and implementation

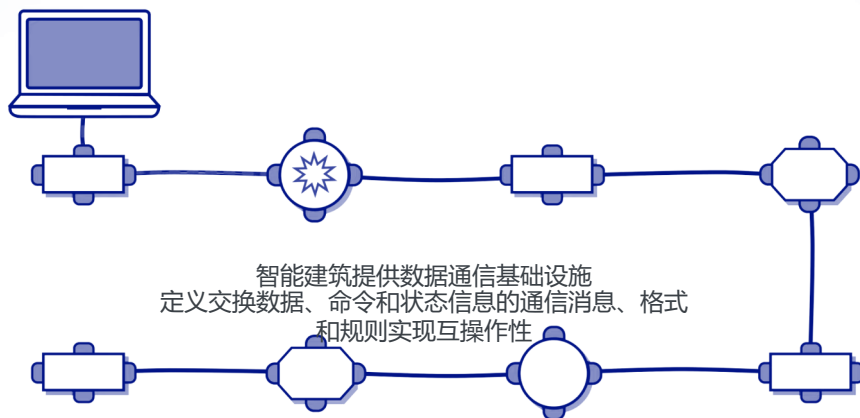
Part 2 Hardware

Part 3 Functions

Part 5 Data communication protocol

Part 6 Data communication conformance testing

Open ecosystem, international standards

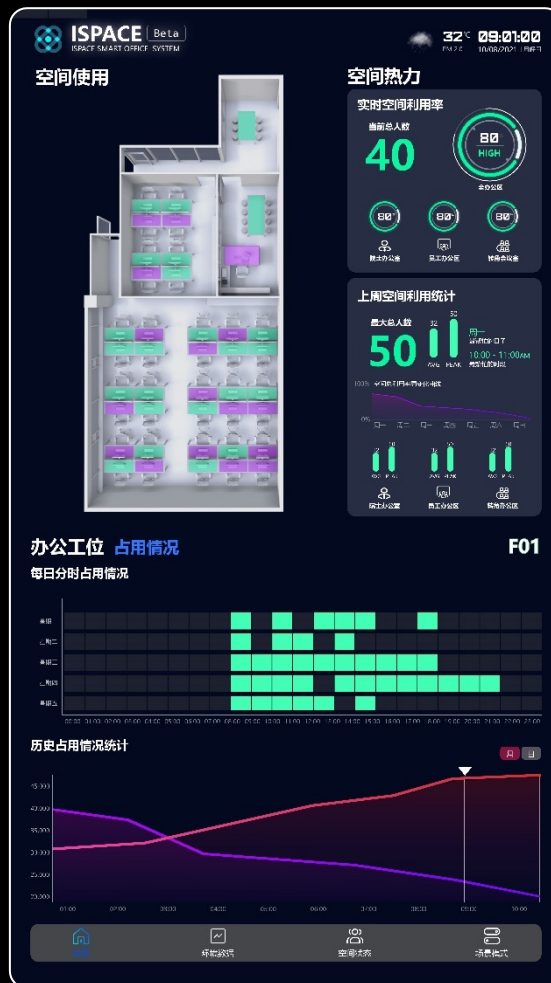


智能建筑提供数据通信基础设施
定义交换数据、命令和状态信息的通信消息、格式
和规则实现互操作性

Achieve interoperability between devices and
control devices in building IoT applications

实现建筑物联网应用的设备和控制设备之间的互操作性

Dashboard Customized Interface Design



Data Report

Discover patterns behind the data

ISPACE Beta
SMART OFFICE SYSTEM

DATA REPORT

建筑院办公区数据报告

Nov.2023 - Dec.2023

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Meeting Room2

From 2023-11-01 00:00
To 2023-01-07 23:59

Scenes

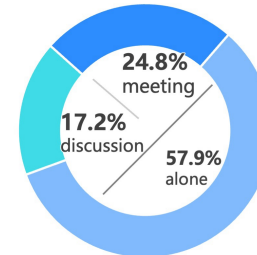
Basic 126 times Meeting 15 times Movie 8 times Rest 5 times Left 75 times

Space utilization

1 person-alone
6985 min

2 persons-discussion
2075 min

>3 persons-meeting
2985 min



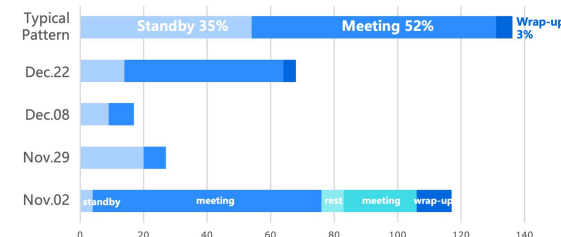
Total number of meeting
17 times

Max number of people
10 persons

Avg Duration
136min

The Latest Meeting
21:55
2023.Nov.29

Patterns of meetings (stages and duration)



Meeting Room1

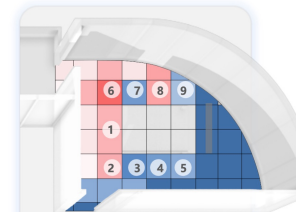
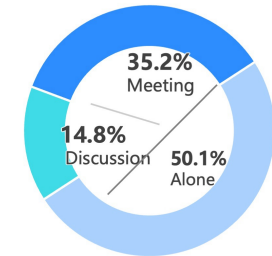
From 2023-11-01 00:00
To 2023-01-07 23:59

Space utilization

1 person-alone
3470 min

2 persons-discussion
1030 min

>3 persons-meeting
2440 min



Favorite Chair
最受欢迎位置
6

Avg Duration
129min

Max number of people
15 persons

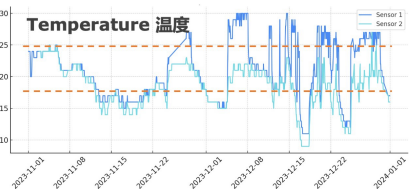
Total number of meeting
20 times

ID	Date	Start	End	Duration
1	Nov.20	12:44	16:51	4h07min
2	Nov.29	17:20	21:15	3h55min
3	Jan.04	12:35	16:15	3h40min
4	Dec.13	10:55	14:30	3h35min
5	Nov.24	09:20	12:15	2h55min
6	Dec.07	14:00	16:35	2h35min
7	Dec.22	10:05	12:35	2h30min
8	Dec.08	15:00	17:30	2h30min
9	Jan.05	09:45	12:10	2h25min
10	Dec.11	10:25	12:25	2h00min
11	Dec.18	14:40	16:35	1h55min
.....				
20	Dec.06	10:10	10:30	20min

Air Quality-Office Room

From 2023-11-01 00:00
To 2023-12-31 23:59

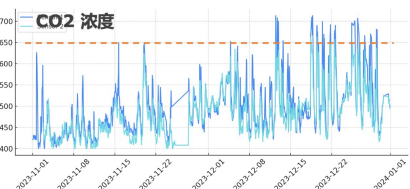
Sensor1 Near Window Sensor2 Near Wall



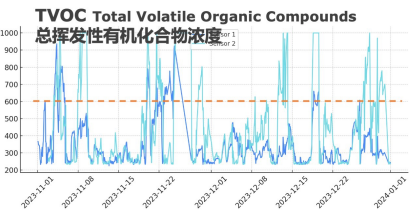
Sensor1 Avg
21.1°C ↑
Sensor2 Avg
18.4°C
Percentage of
Comfortable
Temperature
(18-25°C)
77.71%



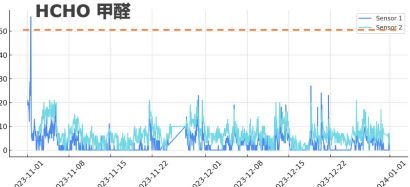
Sensor1 Avg
41.7% ↑
Sensor2 Avg
38.2%
Percentage of
Comfortable
Humidity (30-
70%)
81.82%



If CO2 exceeds
the standard
650ppm, window
will be opened
automatically
During working
hours (9:00-18:00)
open 23 times



Sensor1 Avg
379.2 µg/m³
Sensor2 Avg
458.2 µg/m³ ↑
The period when
TVOC exceeds the
standard (> 600)
15.19%



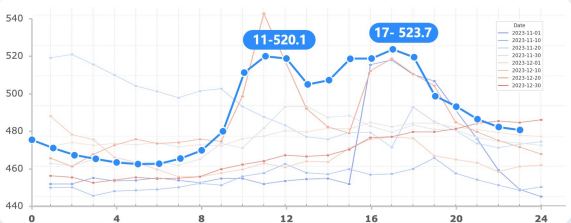
Sensor1 Avg
4.2 µg/m³
Sensor2 Avg
7.1 µg/m³ ↑
The period when
HCHO exceeds the
standard (> 20)
0.02%

Air Quality-Office Room

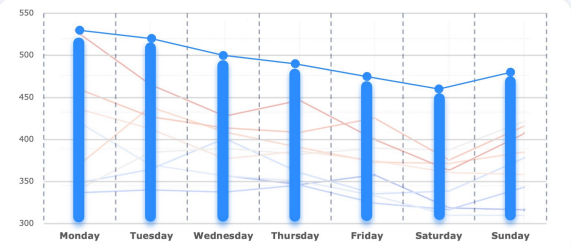
From 2023-11-01 00:00
To 2023-12-31 23:59

CO2 PM2.5

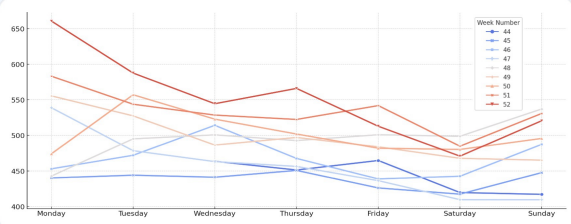
Average Daily CO2 Levels



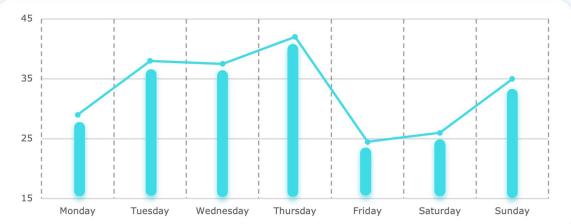
Average Weekly CO2 Levels



Daily CO2 Levels for Each Week



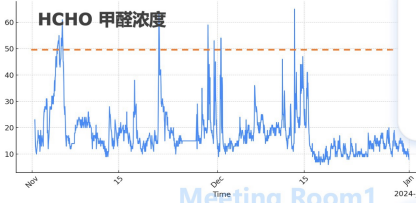
Average Weekly PM2.5 Levels



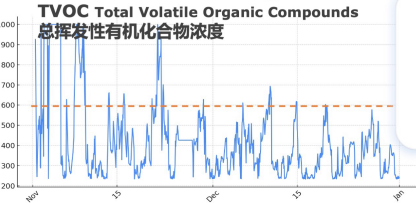
Air Quality-Meeting Room

From 2023-11-01 00:00
To 2023-12-31 23:59

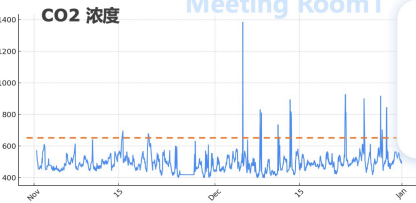
MR1 MR2



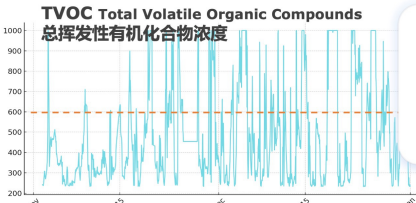
8.7
Exceed%
Health%
91.3



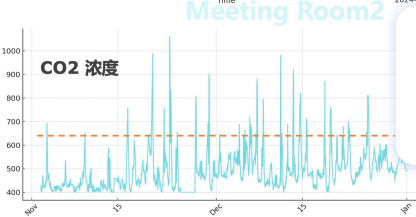
7.7
Exceed%
Health%
92.3



6.7
Exceed%
Health%
93.3



30.9
Exceed%
Health%
60.1



17.3
超标%
Health%
82.7

iSpace

未来城市爱家智能科技（上海）有限公司

E

- E1 数字化方案设计
- E2 智能化方案设计
- E3 平台系统设计

P

- P1 装修材料采购
- P2 智能设备采购
- P3 平台系统搭建

C

- C1 数字化装修改造
- C2 智能化设备安装
- C3 智能化系统集成