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Intellectual Infant Care System

Superparenting

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Xuexun Liu, Shuting Chen

Advisor: Hong Qiu, Xin Wang

Content



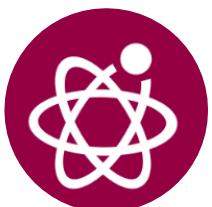
1. Backgrounds



2. Functions



3. Techniques



4. Display



5. Teamwork

01

Backgrounds



Overview



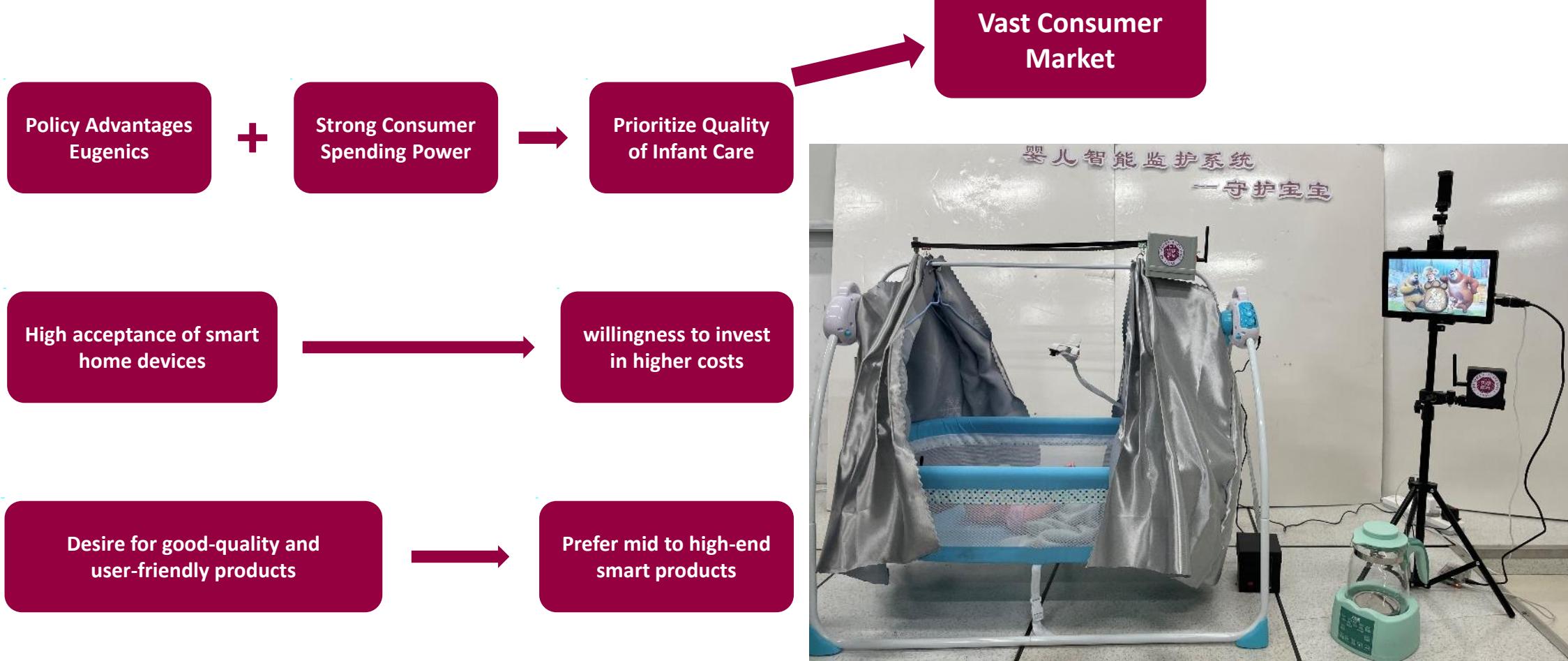
Surveys



Competitors



Background Overview





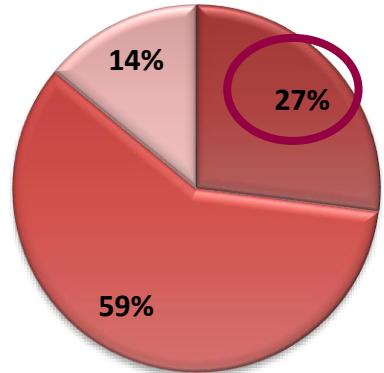
Background Surveys

Surveys of Target Consumer Group for Infant Smart Monitoring System



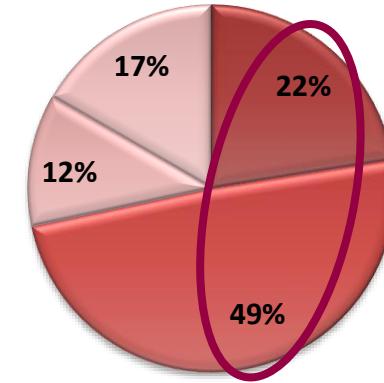
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Familiarity with Smart Products for Infants and Toddlers



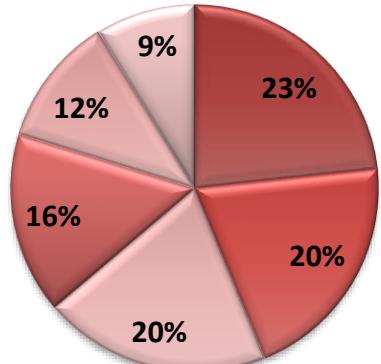
- Familiar
- Aware
- Not familiar

Acceptance of Smart Products for Infants and Toddlers



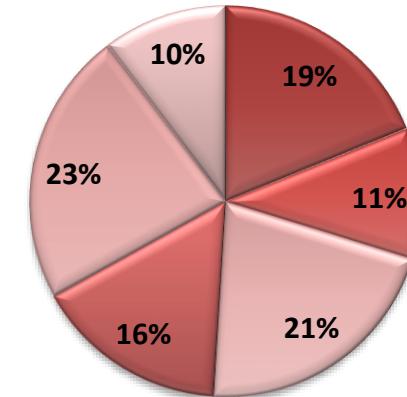
- Highly anticipate
- Accept
- Reluctantly accept
- No accept

Expectations for Smart Products for Infants and Toddlers



- Safety security
- daily life needs
- Entertainment
- User-friendly
- Low cost
- Others

Drawbacks of Traditional Infant and Toddler Products



- Limited automation
- High maintenance
- High cost
- Complex operation
- Safety risks
- Others



Background Competitors



Names	Functions	Drawbacks
BOSCH Bosch Smart Baby Crib <small>科技成就生活之美</small>	Multi-scene functionality, remote caregiving	Lacks smart monitoring, automated care features
 LoveUBaby Monitor	Baby sleep state recognition, sleep analysis	Cannot streamline infant care
 Xiaomi Baby Monitor	Cry detection, motion detection	Limited monitoring features
 Seahorse Papa Monitor	Virtual fencing, cry detection, sleep recognition	Lacks intelligent device management



Background Conclusions

Intelligent Infant Care System
Necessary, In Demand, Promising



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Target users have limited awareness of smart infant and toddler products

This calls for dedicated promotional efforts and presents promising market prospects



Target users show a strong acceptance of smart infant and toddler products

This inspires us to address this market demand with practical solutions



A holistic demand framework of “safety, life, education, entertainment”

we derived the target user group's demands as a starting point for product design

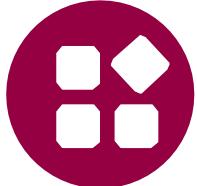


Traditional infant and toddler products have low competitiveness

We leverage strengths, mitigate weaknesses, and further enhance product design

02

Functions



Overview



Hardwares



Softwares



Functions Overview

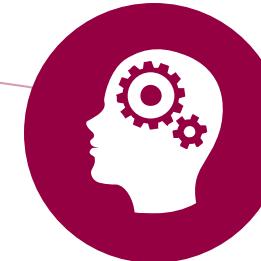
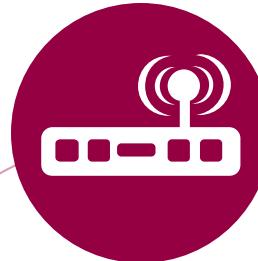


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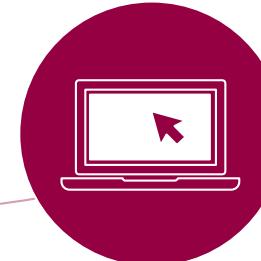
Data Collection & Reporting

Gather information on the infant using various sensors.

Report it to the IoT platform via Raspberry Pi



Overview



Sleep Status Detection

Using a camera and object detection algorithm to identify real-time infant sleep status, displayed on the web interface

Smart Decision-Making

The system makes intelligent decisions based on data collected from sensors.

Website Control

Real-time web access to baby and environmental information. User-friendly features include a mom's forum, product recommendations, and voice interaction



Functions Hardwares



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1 Remote Interaction

*Early education system.
*Remote video and music playback. *Remote video interaction with the baby.



2

Automatic formula dispenser

Timed milk preparation, warming, sterilization.



3

Diaper Detection

Diapers equipped with temperature and humidity sensors to detect wetness, with reusable sensors.



1

4 Bed Curtain

Motor-driven curtain for opening and closing, automatically closes in high light intensity.



4

5 Data collection

Use sensors for temperature, humidity, body temperature, light intensity, and air quality to gather environmental data.



6

Multi-speed Baby Cradle

Upon detecting baby cries, the cradle motor activates, offering three adjustable levels.



5



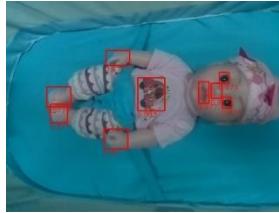
Functions Softwares



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Sleep Status Detection

Use cameras and sensors to collect real-time data and intelligently analyze the baby's condition.



Infant Detection

1

Recommendation System

Search for specific product names. Show the best cost-effective product options.



Recommend
Products

2

Voice Interaction System

One-click voice operation, unified status and control interface, low learning curve.



Voice
Detection

3

Motherhood Community

Expert advice, parenting experiences, after-sales support.



Mothers' Forum

4

Automatic Care System

Environmental data sensing, intelligent decision-making, automatic care.



Automatic Care

5

Alarm and Timing System

Scheduled service activation, multiple alarms with customizable frequencies.



Timing

6

03

Techniques



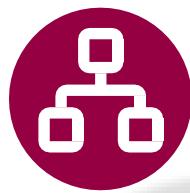
Overview



Hardwares



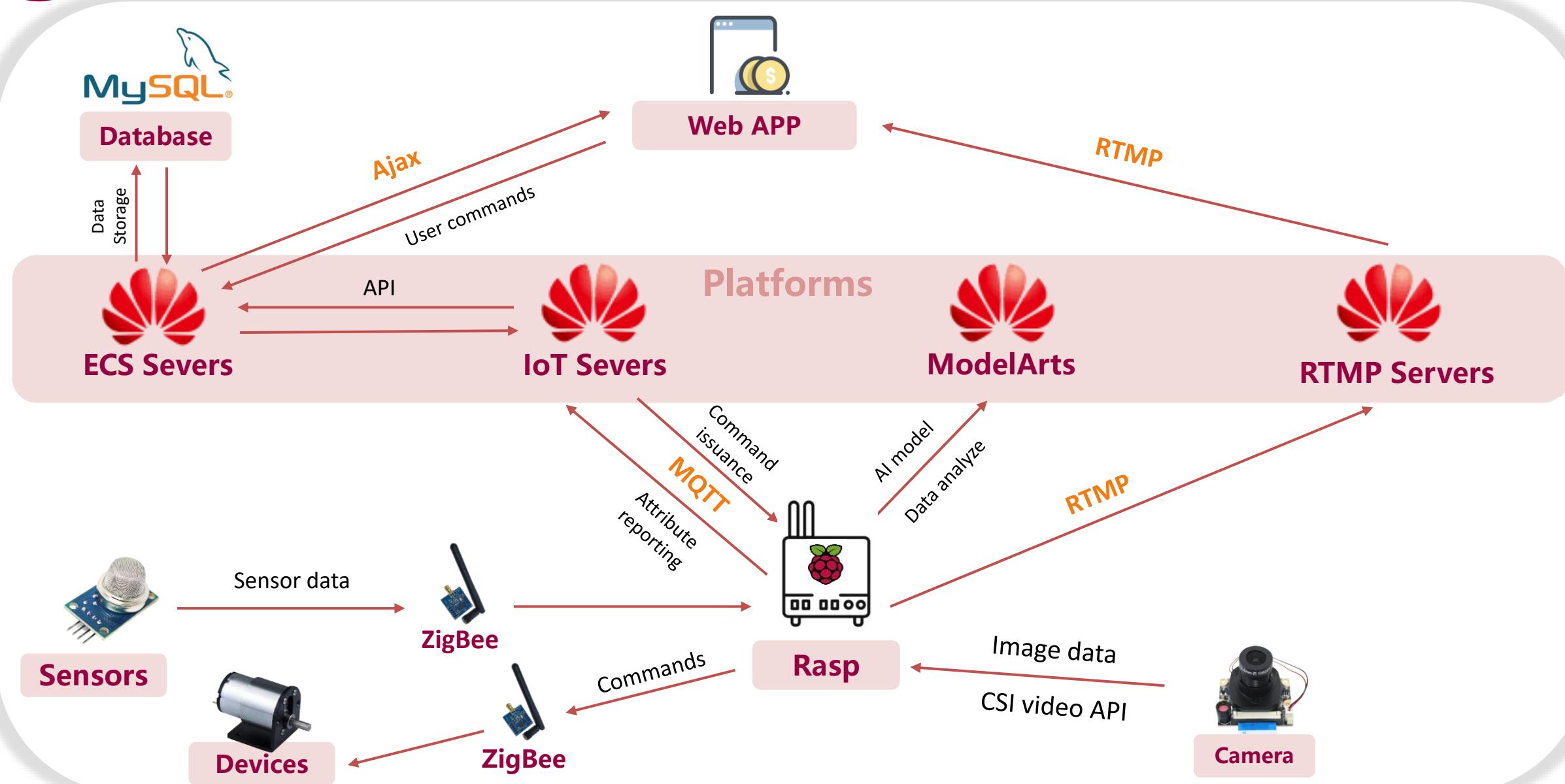
Softwares



Techniques Overview



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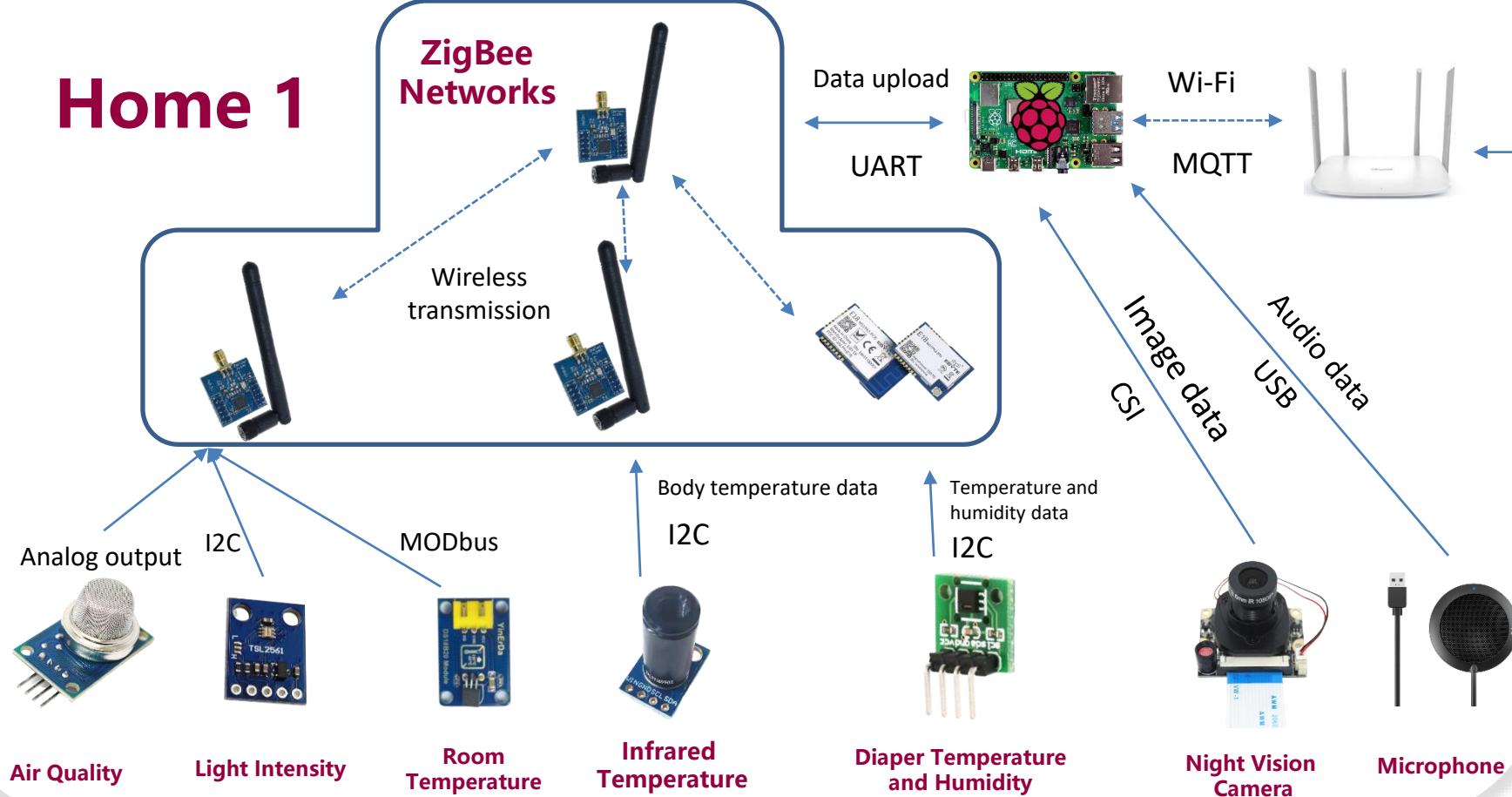


Techniques Hardwares — Data Acquisition

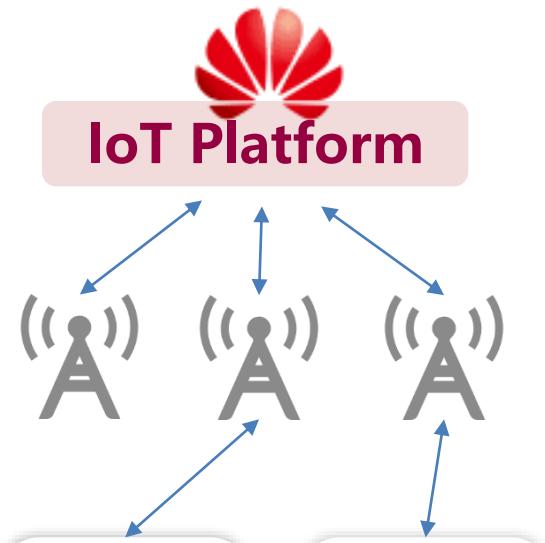


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Home 1



Home 2 Home 3



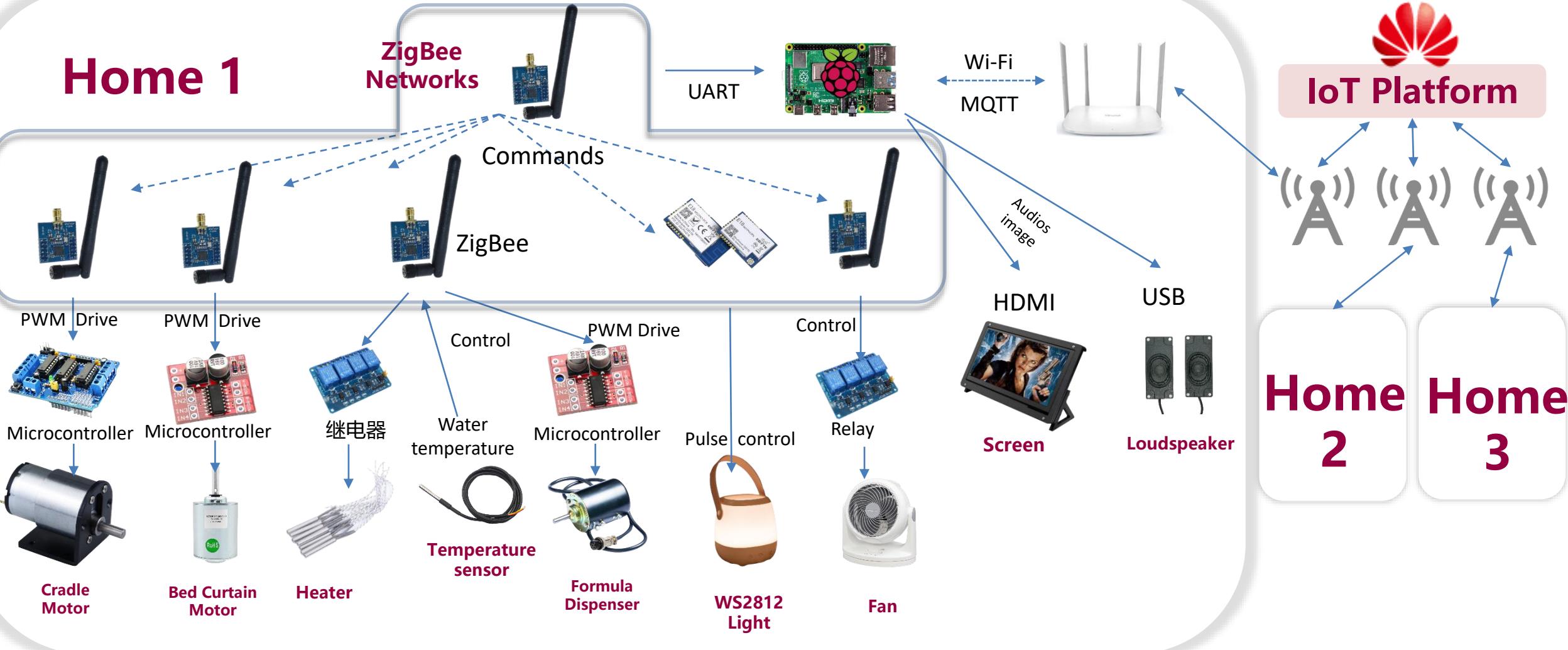


Techniques Hardwares — Devices Activation



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Home 1

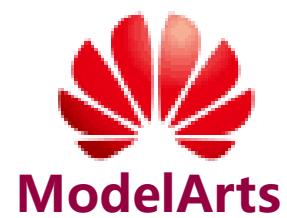




Techniques Softwares



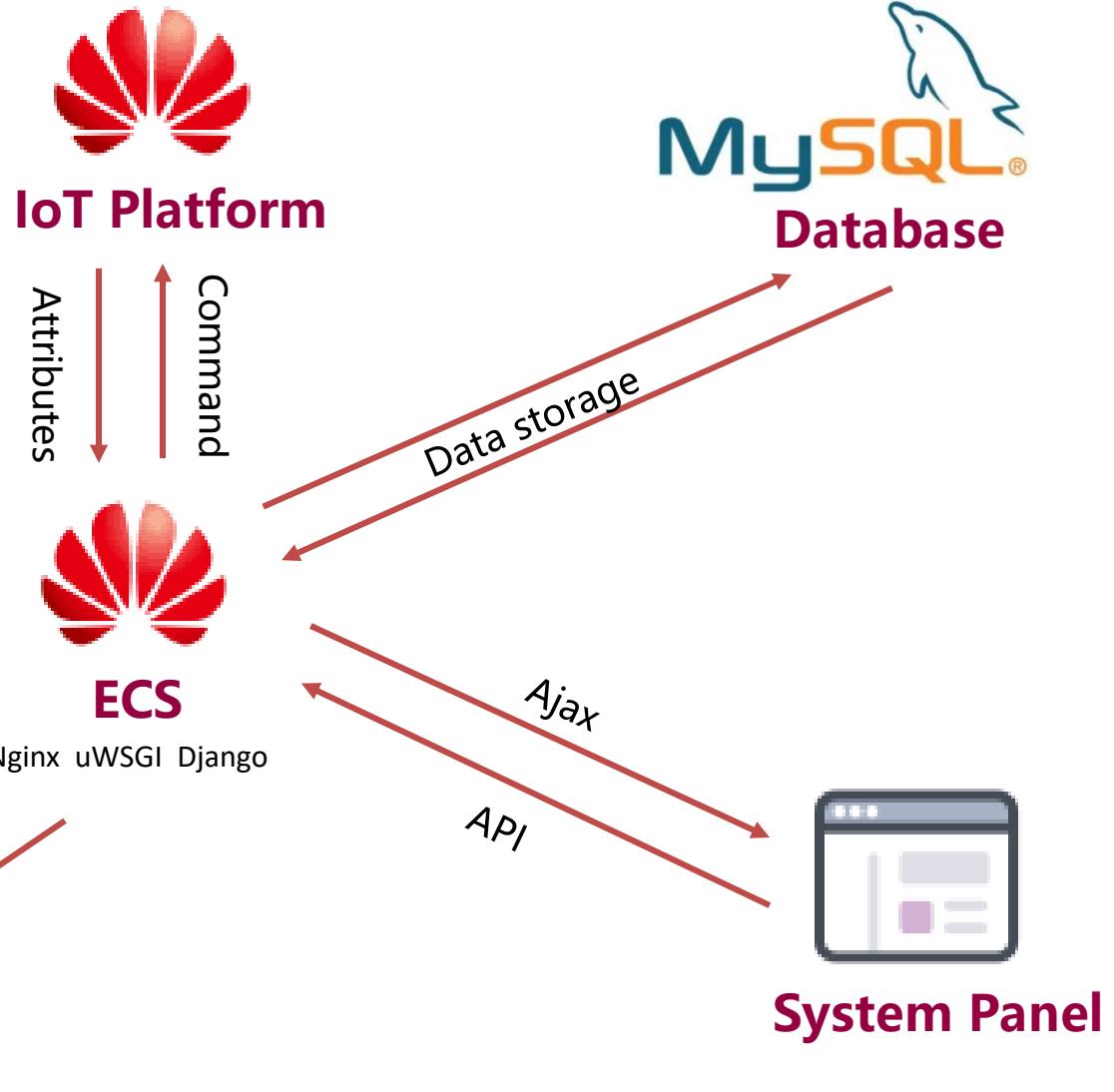
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ModelArts

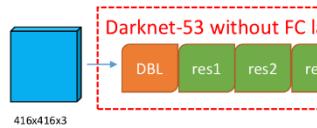
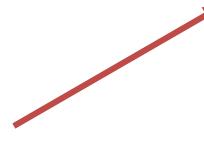
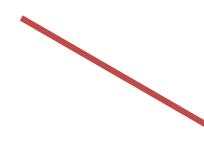


APP Functions

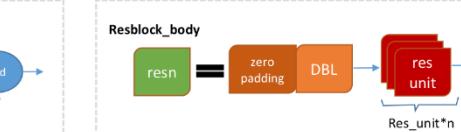
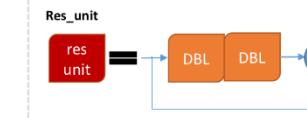
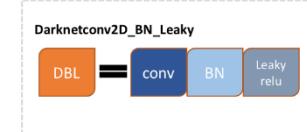
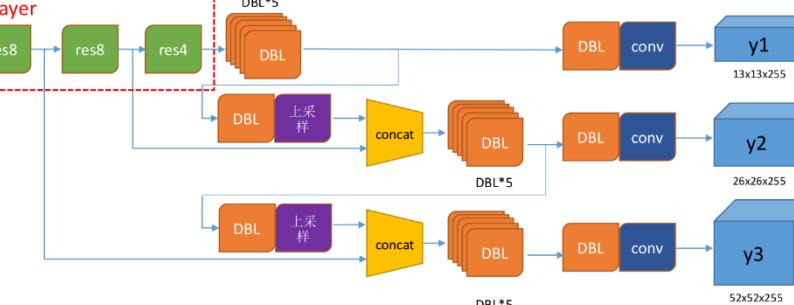




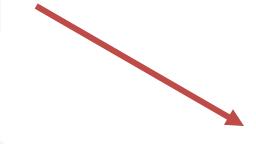
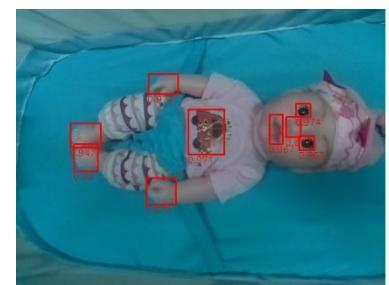
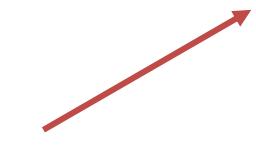
Visual Detection Technology



Yolo_v3_Structure
made by Levio
(levio123@163.com)



<https://blog.csdn.net/Levio>

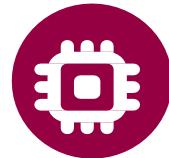


04

Display



Overview



Hardwares



Softwares



Display Overview



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Bed Curtain
motor

Camera

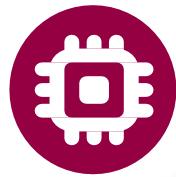
Cradle

Video Player

Signal
Transmitter

Milk Formula
Dispenser

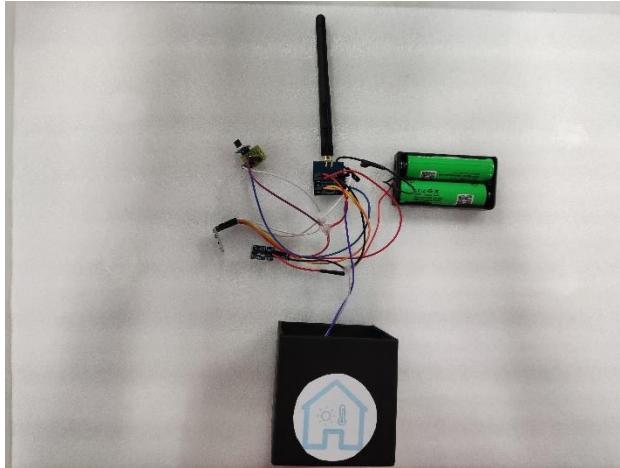
Raspberry Pi
Smart Gateway



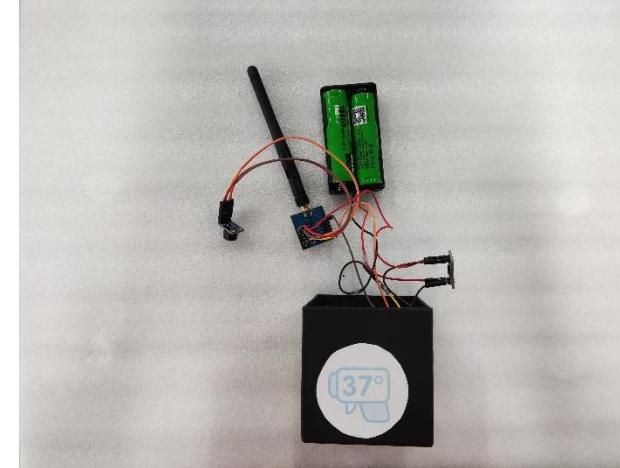
Display Hardwares



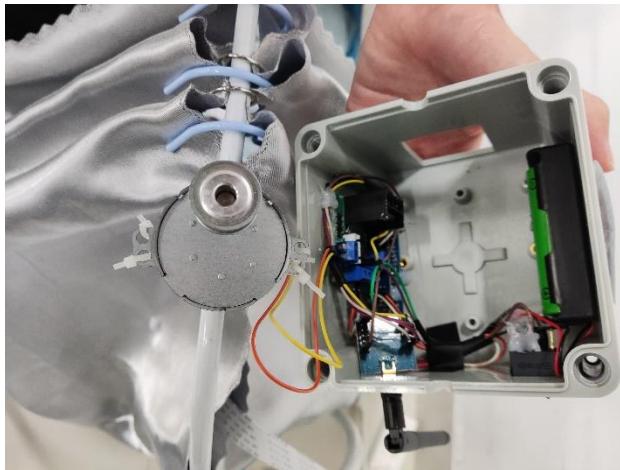
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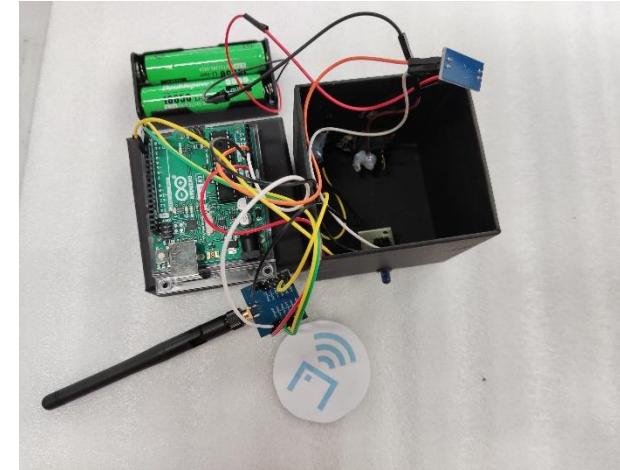
Light & Room Temperature Sensor



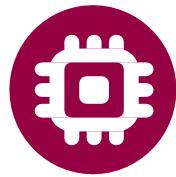
Body Temperature Sensor



Motor for Bed Curtain



Infrared signal Transmitter



Display Hardwares



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Closing of Bed Curtain



Automatic Rocking Cradle



Remotely Controlled Video Player



Automatic Milk Formula Dispenser



Display Softwares — Sleeping Detection



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Normal



Nasal Coverage



Prone Sleeping



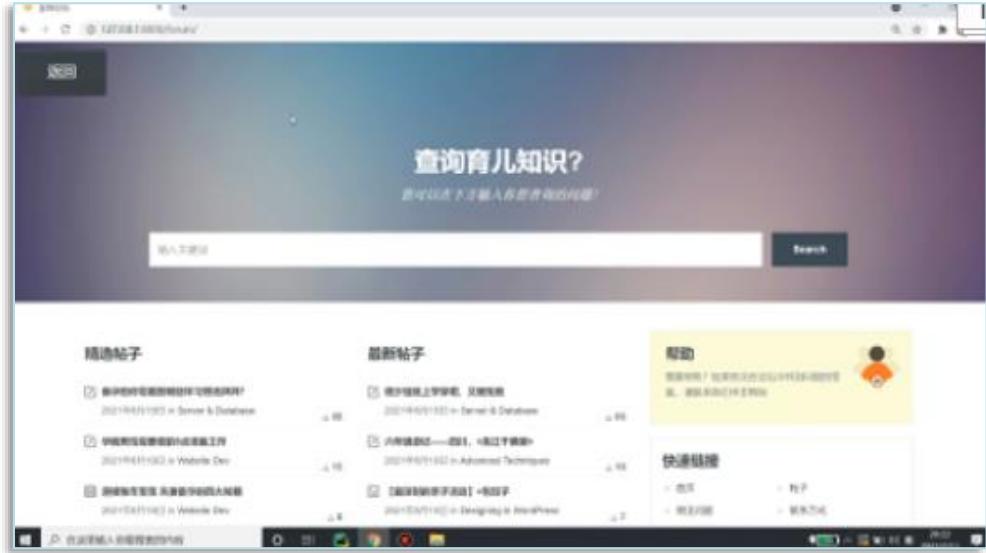
No Blanket



Display Softwares — Website System



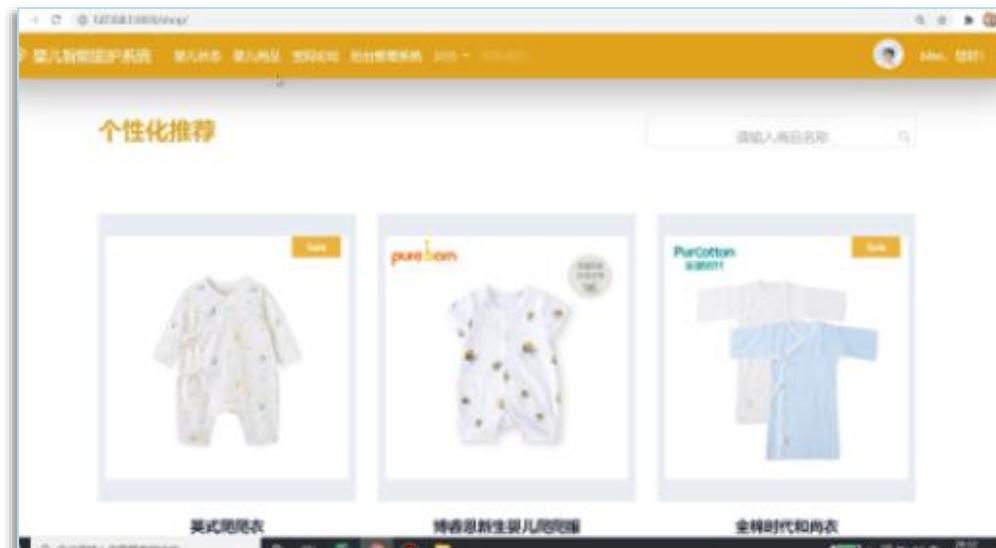
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Motherhood
Community



Timing System



Recommendation
System

05

Teamwork

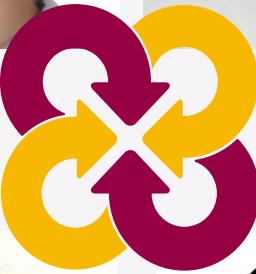


Teamwork

Guohao Dai

Websites

Algorithms



Xuexun Liu

Algorithms



Guihong Ma

Hardwares

Shuting Chen

Paperwork



Team Portrait





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**Safeguard the Future
of Every Family**

THANKS FOR YOUR ATTENTION