

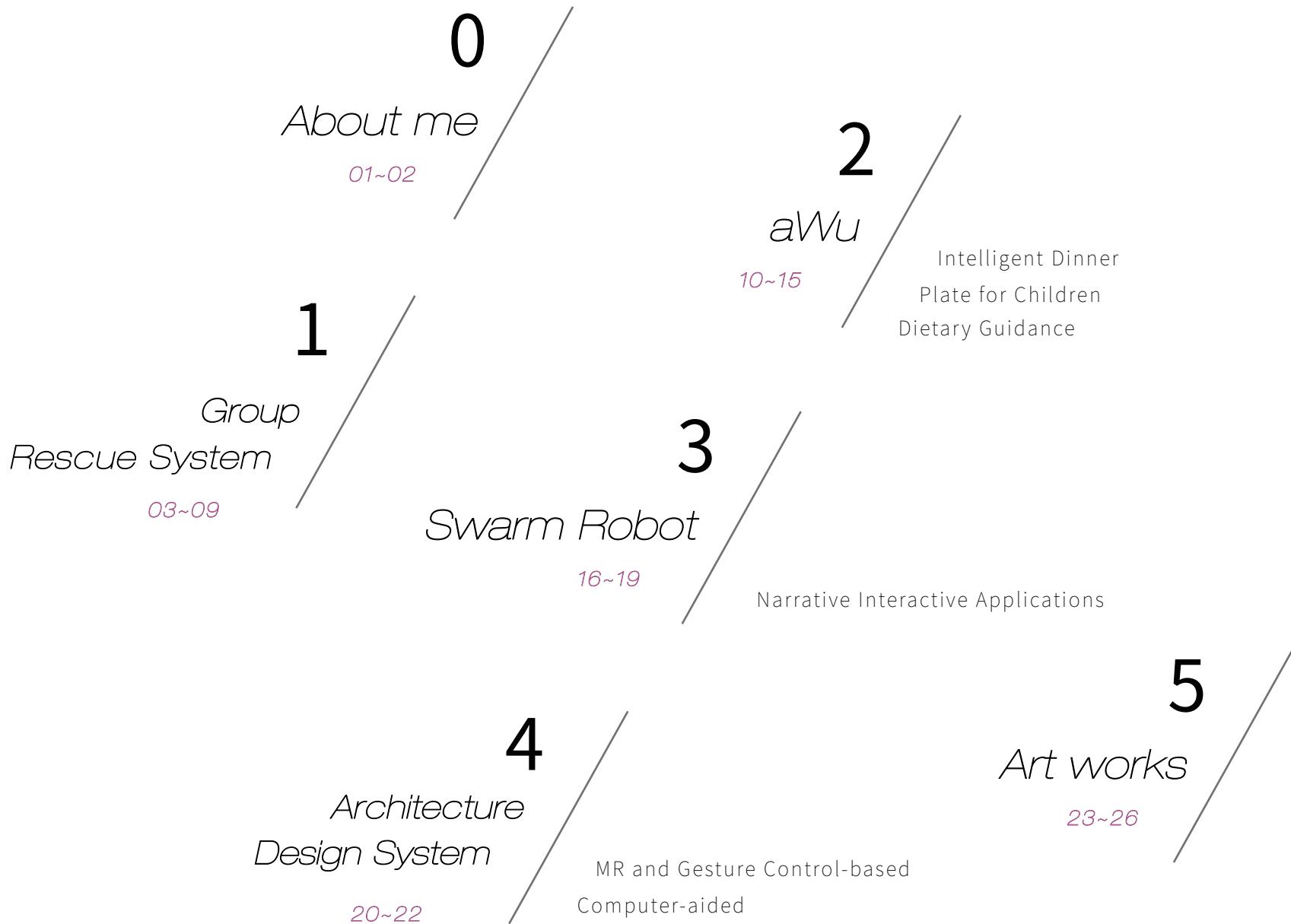
Portfolio

Jia Yingqi

Tongji University 2015-2020



Content



About me

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Female
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Jia Yingqi



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EDUCATION

Industrial Design / Tongji University 2015/09 - 2016.07

Computer Science and Technology / Tongji University 2016/09 - 2020.07



RESEARCH EXPERIENCES

Automated RC Cars / Tongji University 2018/03 - 2019/05

Single Cell RNA Sequencing Data Analyses System / Fudan University 2019/03 - 2019/05

Narrative Interactive Applications of Swarm Robot / Tsinghua University 2019/07 - 2020/12

A Mixed Reality and Gesture Control-based Computer-aided Architecture Design System
/ Tongji University 2020/01 - 2020/06

WORKING EXPERIENCES

Examination System Project Team / Shanghai Qiyue Education Technology Co., Ltd / Intern 2020/06 - 2020/09

Application Development Service Center / Shanghai Pudong Development Bank / Formal Employee 2020/09 - Present

SKILLS

● ● ● ● ○ C++ / HTML / SQL / Python ● ● ● ○ ○ Javascript / Java

● ● ● ○ Arduino / FPGA / Tiny4412 ● ● ● ● ○ Ai / Ps / Ae / Dw / Pr / Sketchup / Rhino / Revit / CAD

01

Group Rescue System

Disaster scene and wilds
rescue information system

based on WLAN Ad-hoc



Background

1

Victims have no direct means of communication. It is difficult to help each other.

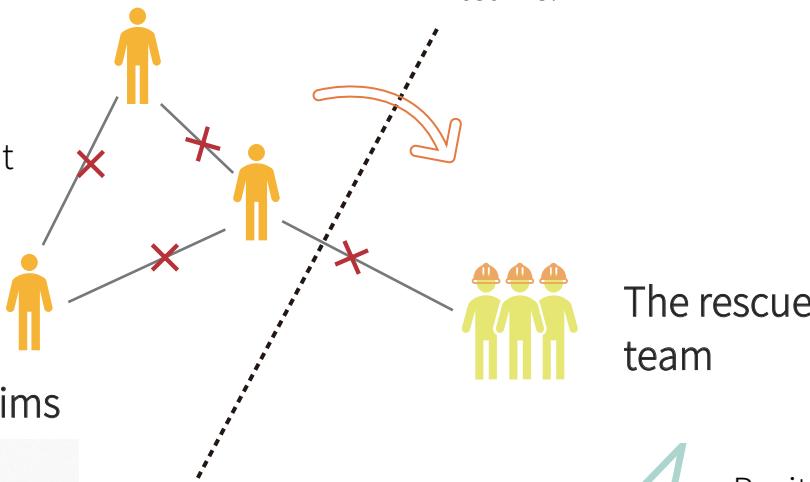
Victims



- Collapses of houses caused by disasters are common in remote areas such as mountain areas and valleys.
- The base stations are destroyed, and the operator's signal is interrupted.
- Large search area, chaotic and complex building terrain structure

2

Victims are waiting passively for rescue and have no means to contact the rescue teams.



3

The scene situation is complex. Only rely on the intercom information is insufficient; need the multi-angle audio-video auxiliary survey.

4

Positioning is slow, and the rescue team cannot directly locate multiple locations to deploy the rescue plan better.

Solution

Mobile signal car

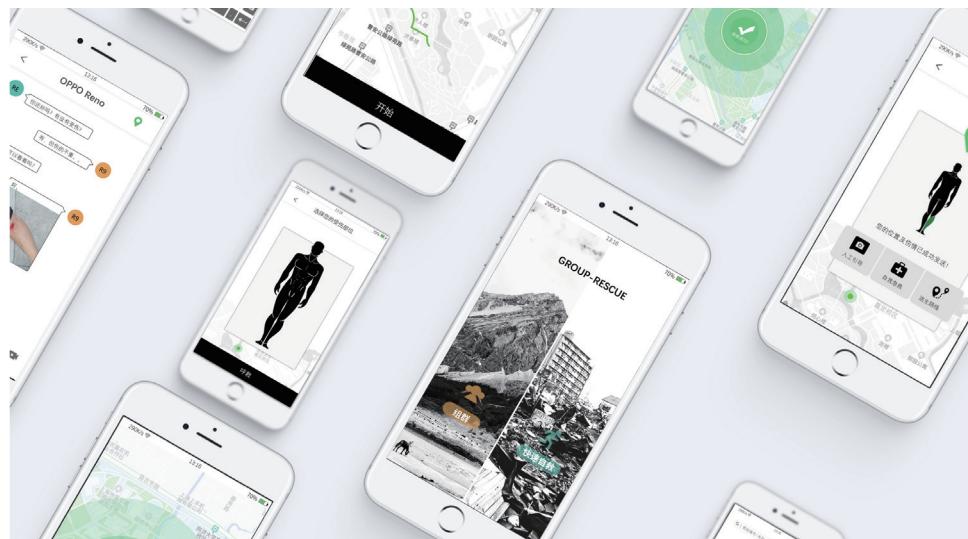
- Enhanced signal



Box type node

- Carried by rescuers for signal enhancement

- Suitable for victims self-rescue in disaster site and field
- Used for rescuers to obtain the specific location of injured people
- Provide wild group communication and mutual rescue methods for travelers
- Provide audio and video communication to convey injury information accurately
- Connected medical care and provided manual first aid instruction
- Outdoor escape route planning services



Solution

Point-to-Point

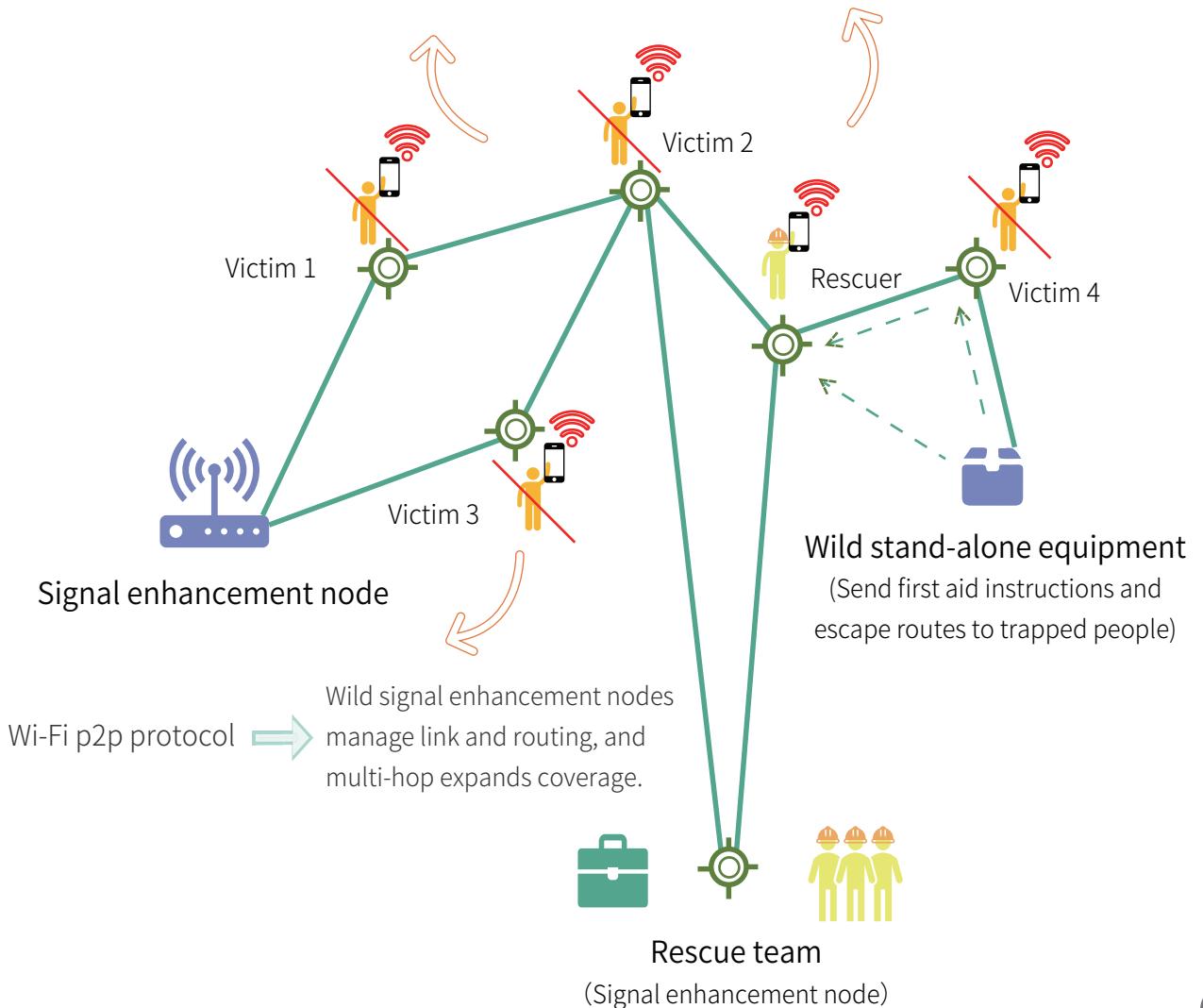
- Data can be transferred directly between any two points
- No data type is limited, mainly audio, video and text
- Can be deployed on mobile phones, watches or other devices

Regional public localization

- Quick location of other members
- Location of all devices in the P2P group can be displayed on the map

TCP protocol ➡ Two points for sending and receiving communication data

UDP protocol ➡ Broadcast own location and receive others' location



Personas

Margo



- Female
- 23 years old
- College student
- New member of snail travel student club
- Margo took part in the mountain climbing activity first time. The destination of the activity was Qiansongba Forest Park in Fengning Manchu Autonomous County, Chengde City. There was no cell phone signal, and she was afraid she would get separated from her teammates.
- Margo and his teammates need a way to connect.

- Male
- 27 years old
- Volunteer teachers in mountainous areas
- Earthquakes often occur in Sichuan, so Shen downloaded the Group-Rescue app on his mobile phone in advance. During the earthquake, he was trapped in the corner of the office, the fallen chair hurt his leg, and he could not move.
- Shen needs to contact the outside world in time to get help and treatment.

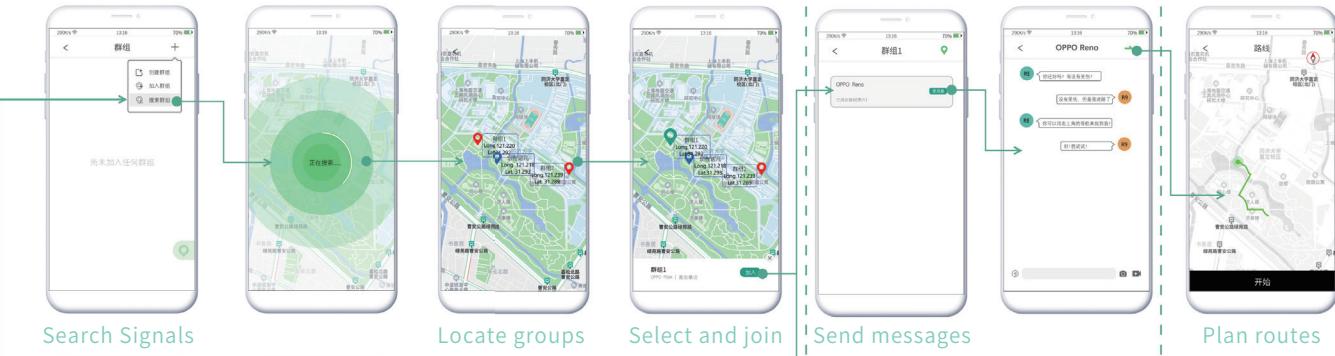


Kangcheng Shen

1. Margo

Margo

Margo arrived, before free activity



Margo reunites with his friends



Select the group mode

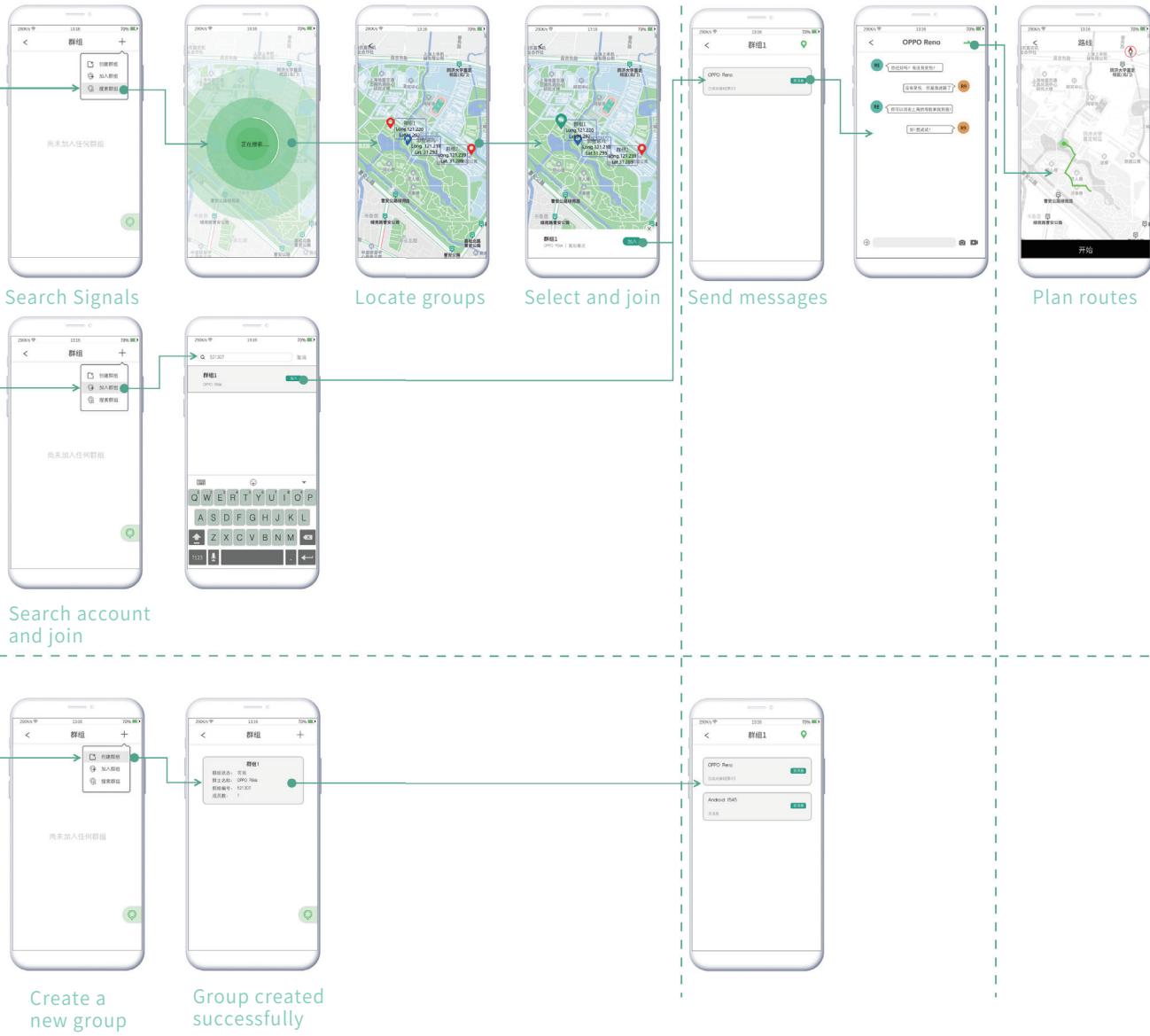
Search account and join

Create a new group

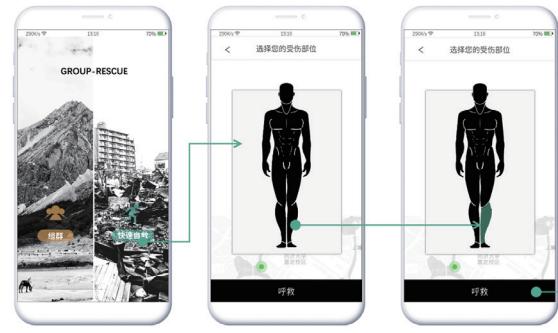
Group created successfully

Margo's teammate

Margo arrived, before free activity



Sudden earthquake, Shen's leg injured, he needed rescue guidance

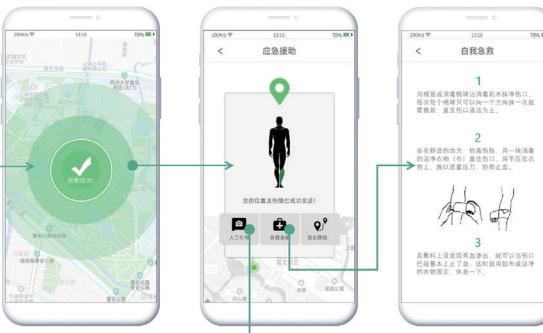


Self-help mode

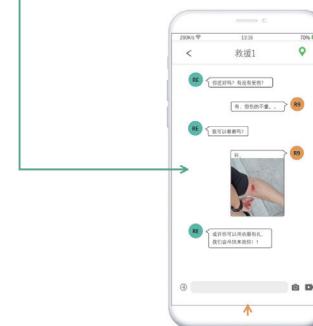
Select the approximate location of the injury

The system automatically selects the nearest rescue station to connect to

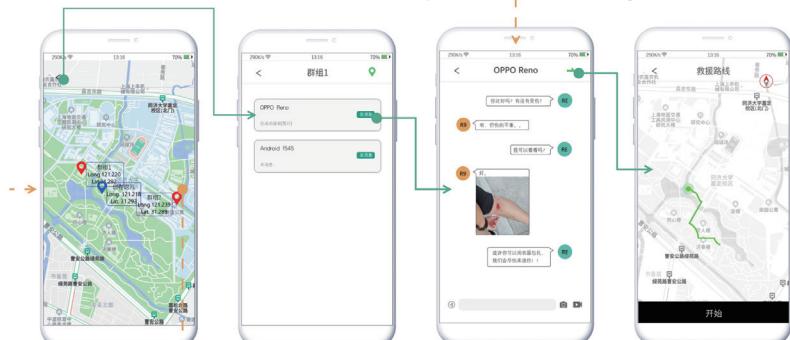
Shen received timely guidance and rescue



Self-rescue information from nearby wild equipment



Both sides communicate with each other, and rescuers provide initial assessment of injuries and first-aid guidance



The victim man was located on the map

Provide route guidance to the victim's location

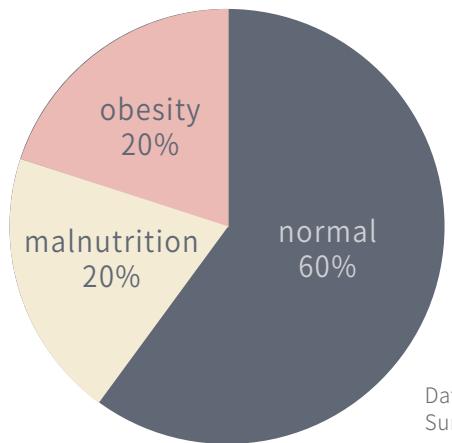
02



aWu

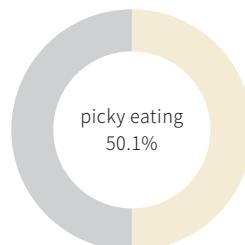
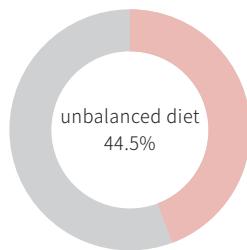
Intelligent Dinner Plate for Children Dietary Guidance

1 Nutrition status of urban children



Data source: Nutrition and Health Survey Report of Chinese Adolescents and Children

3 Children's unbalanced diet, picky eating is common, resulting in uneven nutrition intake



Research introduction: 1620 children aged 3-5 years were selected from Beijing and Shanghai by stratified sampling method

Background

2

The Comprehensive Test Report on the Health Status of Students in Zhejiang Province in Recent 5 Years shows that:

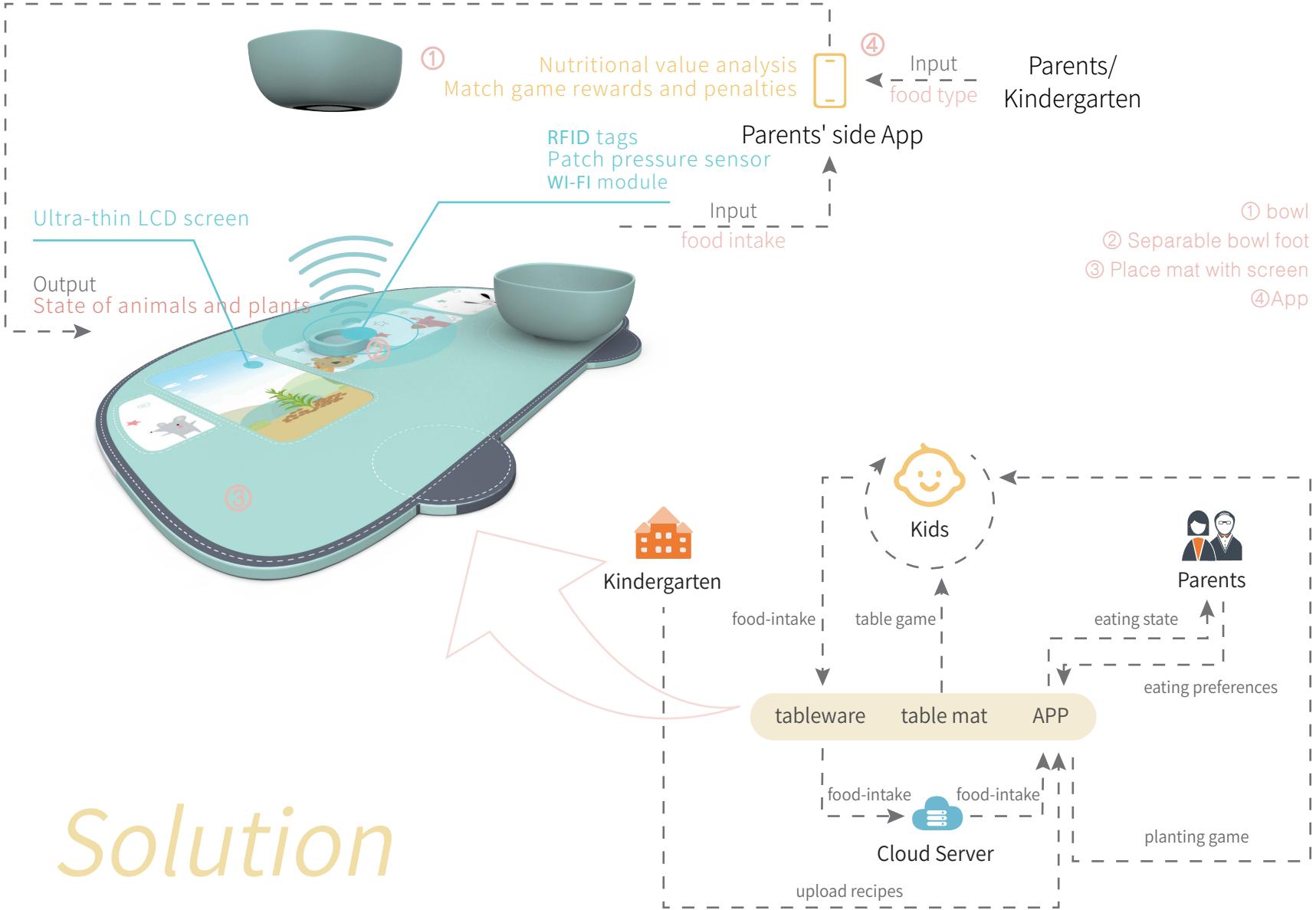
- the incidence of malnutrition reached 26.80%
- child malnutrition is mainly the result of poor nutrition

4

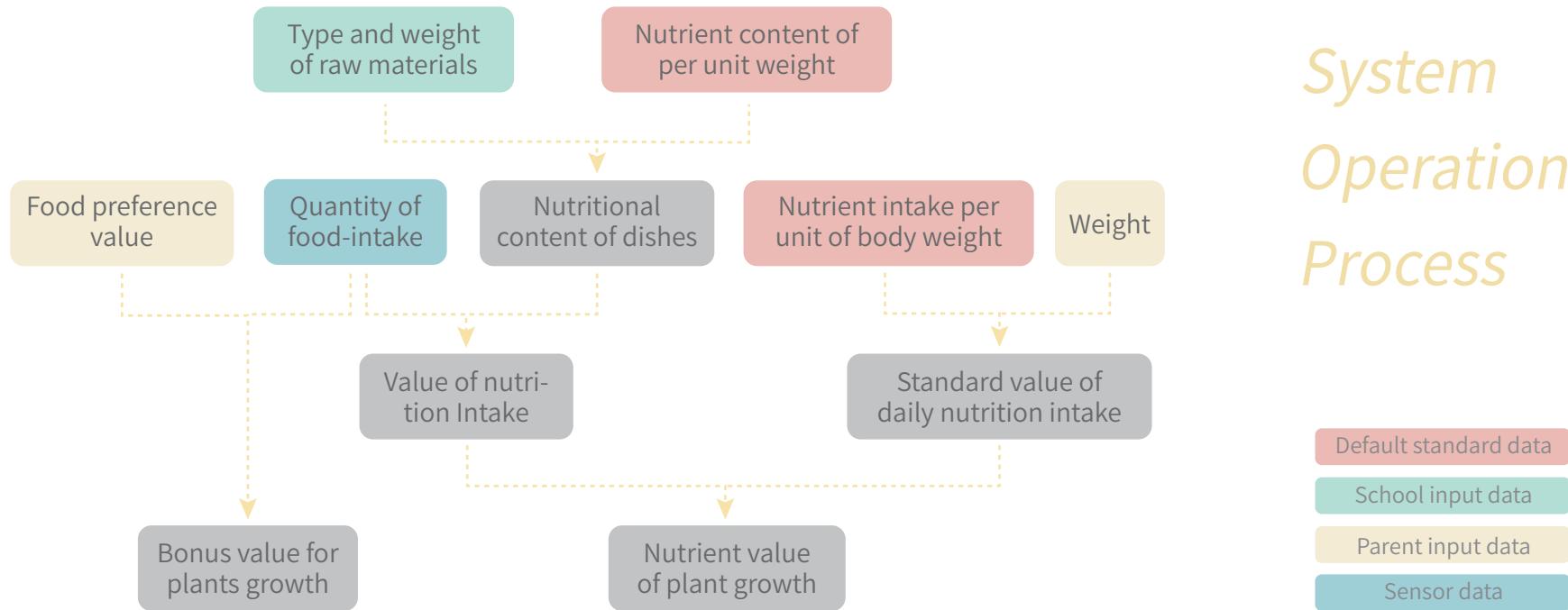
- Lu
- 5 years old
- Like meat, sweet; hate vegetables
- Like to listen to stories while eating
- Like to watch videos while eating



What if we use interactive methods to get kids to eat balance?



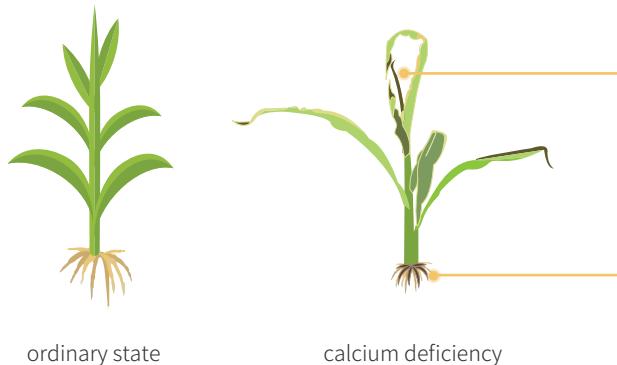
System Operation Process



Quantity of Food-intake + Balanced Level of Eating ==> Animal/Plant Growth



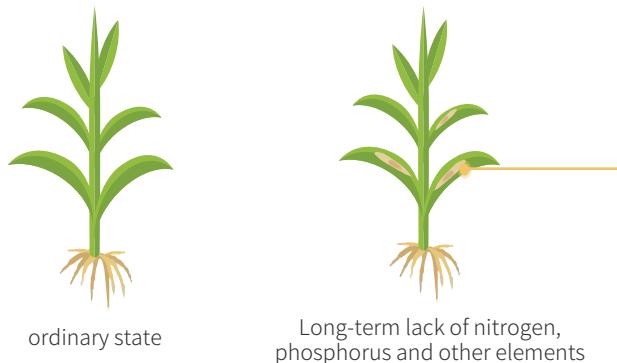
Conversion Method



- Leaf margin dehiscence
- die at growing point

- Few and short roots
- Few new roots
- Old roots come brown

1
Lack of essential elements (e.g. calcium)
==> Stunted growth of animal / plant

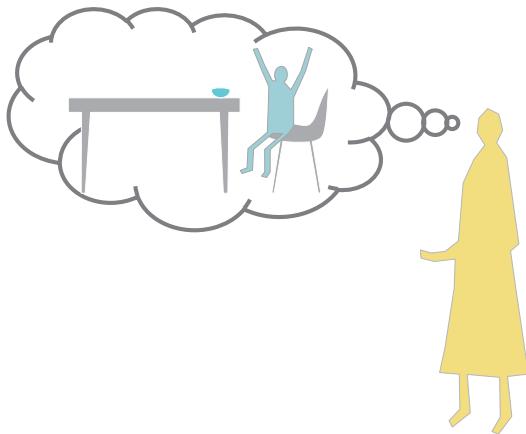


- Too weak resistance
- Suffer from leaf blight

2
Chronic lack of essential elements (e.g., phosphorus)
==> Stunted growth of animal / plant



3
Balanced diet with a normal level of nutrient intake
==> Healthy growth of animal / plant



What did my child eat today?

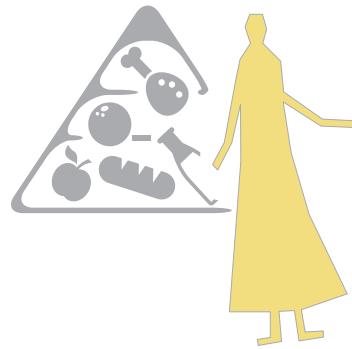
1

U s i n g



Is the nutrition enough?

2



15



What should I have for dinner tonight?

3

Flow

How can I make my child like eating?



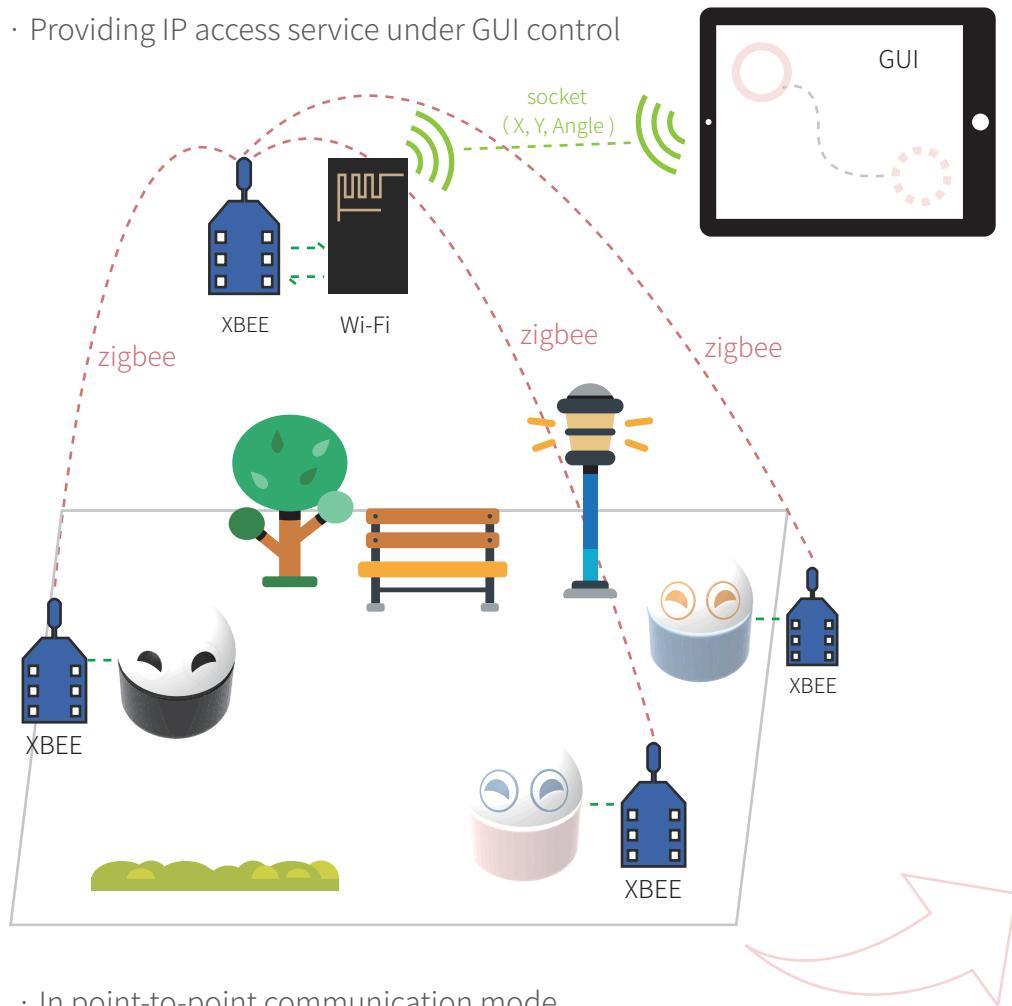
Swarm Robot

· Narrative Interactive Applications of Swarm Robot



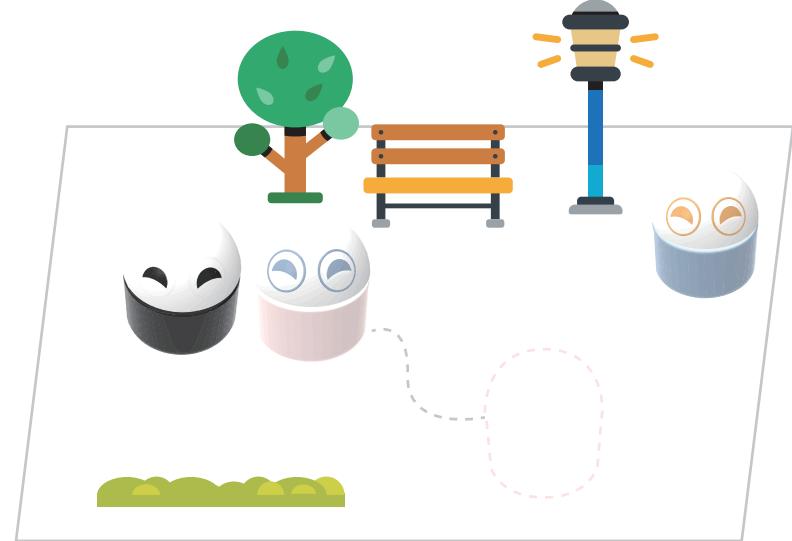
03

- Wi-Fi is in AP mode
- Providing IP access service under GUI control



- In point-to-point communication mode
- A central node XBEE sends and receives packets from a Wi-Fi module through a serial port and sends them to the destination address XBEE

Communication Principle



- Robot receives instructions from the GUI and makes corresponding movements

Color variation



- 416 Chinese were asked to choose which colour best fits each emotion.

Eye patterns



- 403 participants chose the fittest eye pattern-emotion associations, and we evaluated their choices on a 7-point Likert scale.
- Eye patterns design used Daniel and Adam's research result on cross-cultural eye-widening and eye-narrowing theory about human emotions as a reference

Motion designs

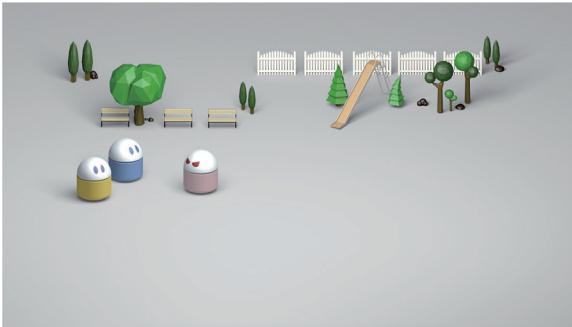
Emotion	Motion
Calm	Continuous smooth linear motion
Happy	Quick movement or rotate/Circular movement
Surprise	Quick movement or rotate/Move toward other robots or objects
Sad	Slowly move far from others/Slow,repetitive, small-angle rotation
Angry	Quick vibration/Quick move far away from other robots
Disgust	Quick move far away from other robots or objects
Fear	Fast, discontinuous movement/Move far away from other robots or objects

User experiments & Results

Robots animations

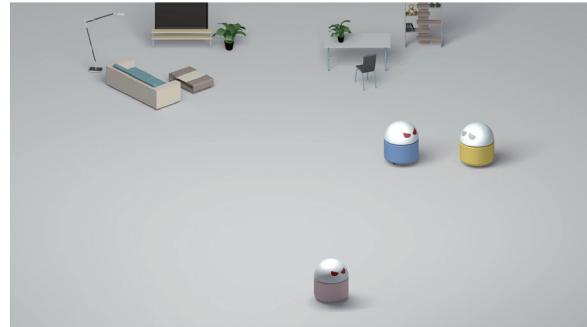
for effectiveness tests of emotion expression on robot emotion parameters selected before

1



a story about a conflict between a couple (played by A, B), after C shows up, A leaves sadly

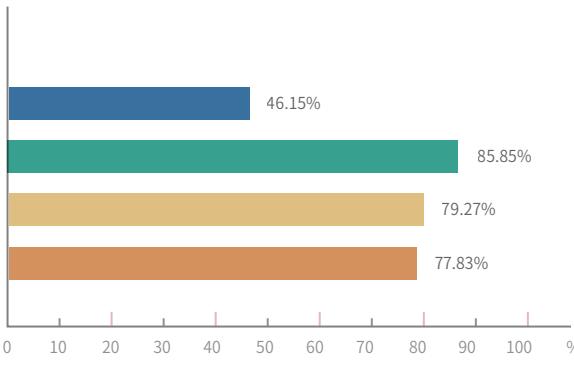
2



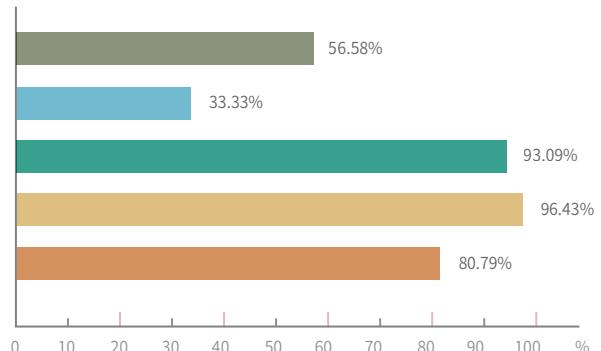
a story starts with B quarrelling with A and story ends in B reconciling with A under the mediating help of C

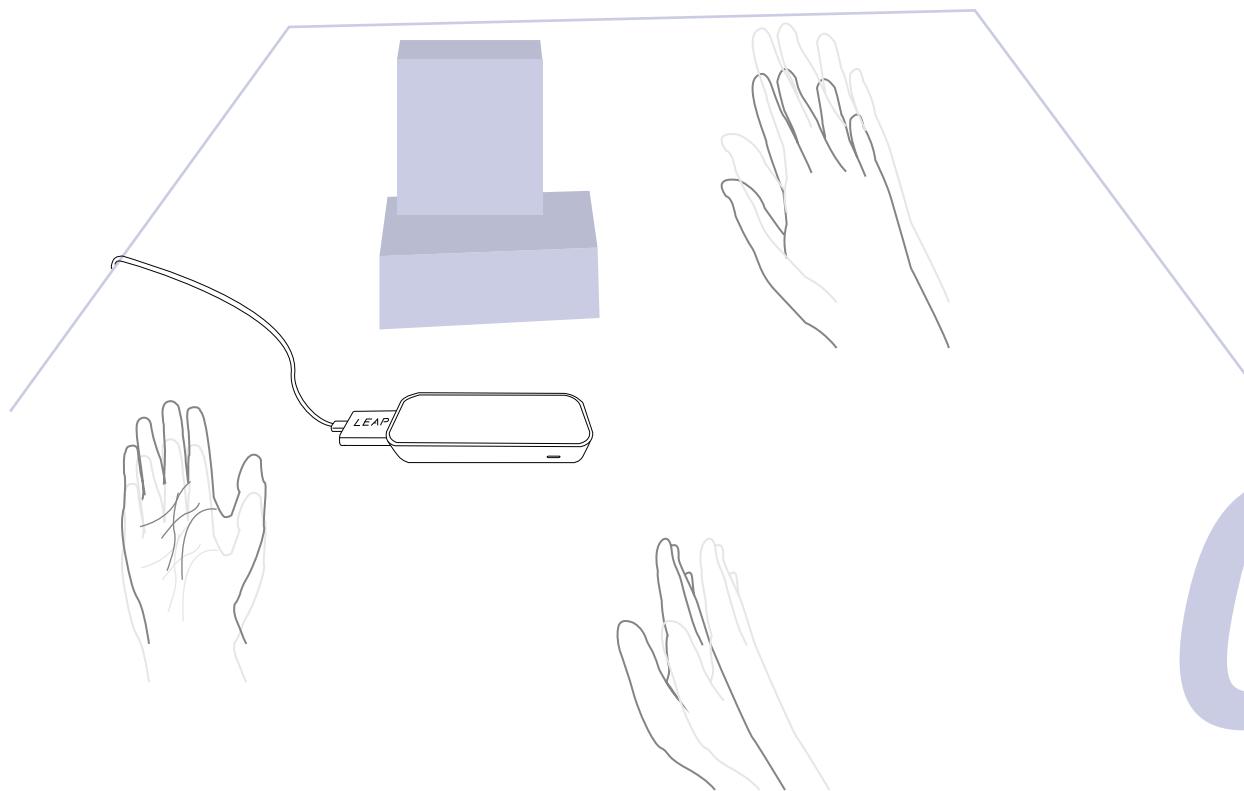
Emotion accuracy

judged by 38 participants ranging from 18 to 35 years old (18 of them were 16-22, 13 of them were 23-28, 5 of them were 29-35)



■ Sad ■ Fear ■ Surprise ■ Angry ■ Happy ■ Calm



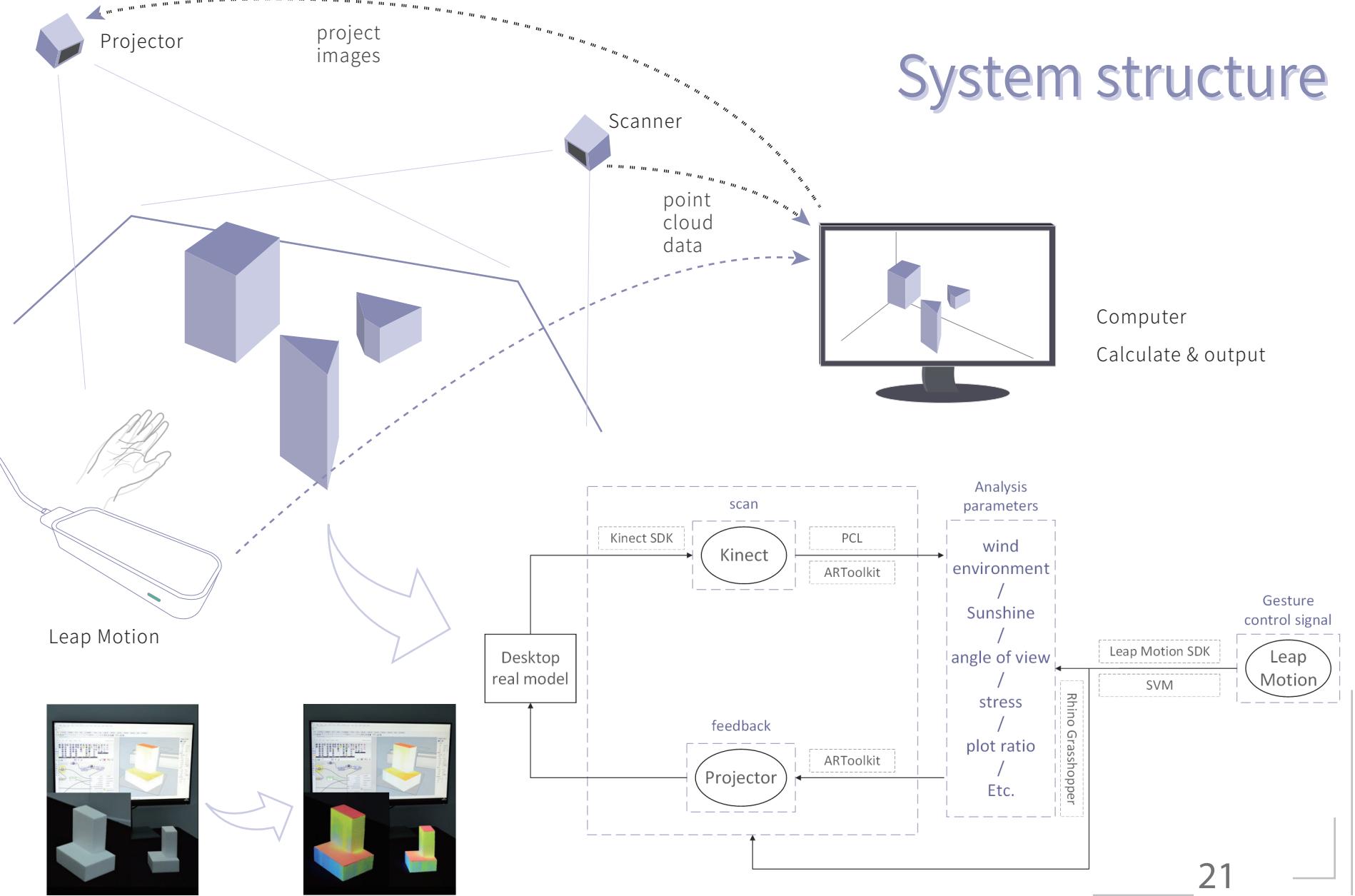


04

Architecture Design System

A MR and Gesture Control-based Computer-aided

System structure

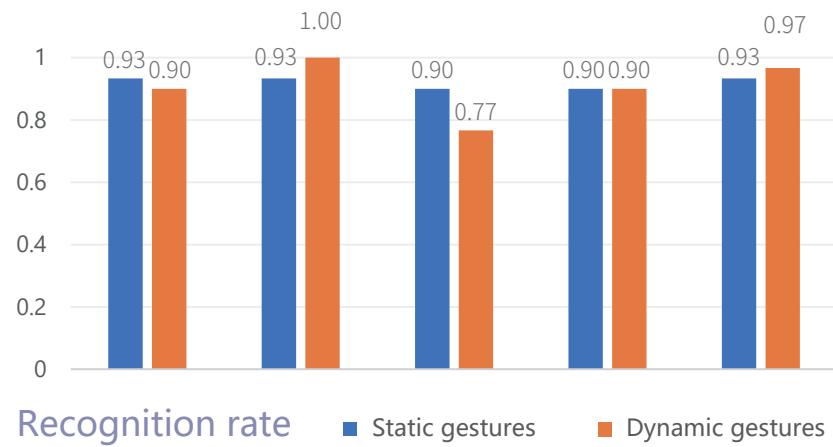


Gesture definition



Algorithm

- Summarize speed thresholds for different dynamic gestures
- Get the frame images with Leap Motion SDK
- Add bone feature data to optimize SVM recognition results
- $5 \times 2 \times 30$ classification tests
- Accuracy of gesture recognition increased more than 3.3%.



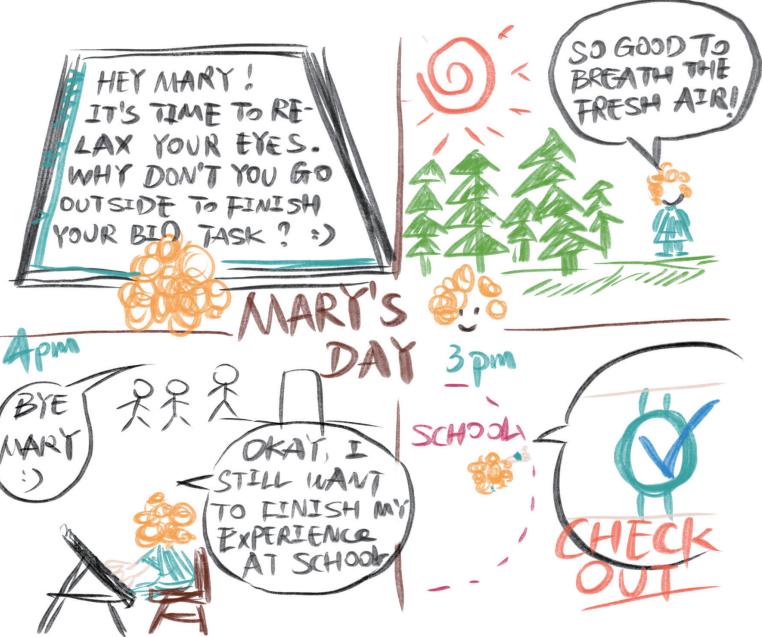
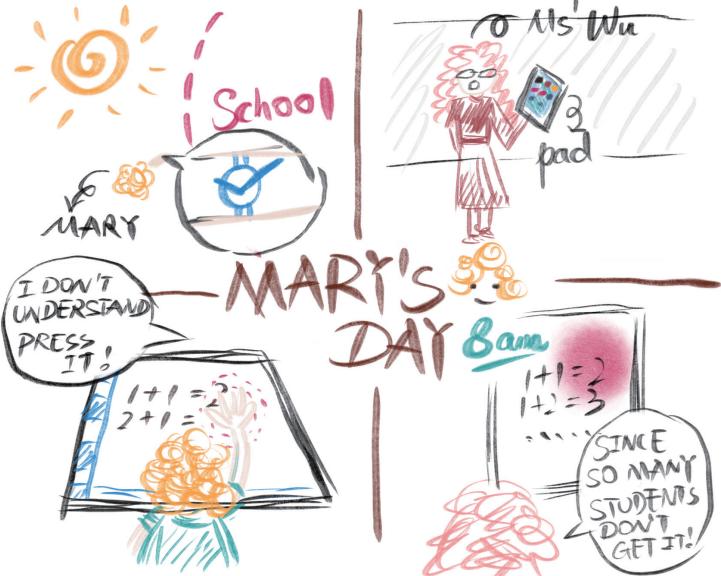
05

Art Works

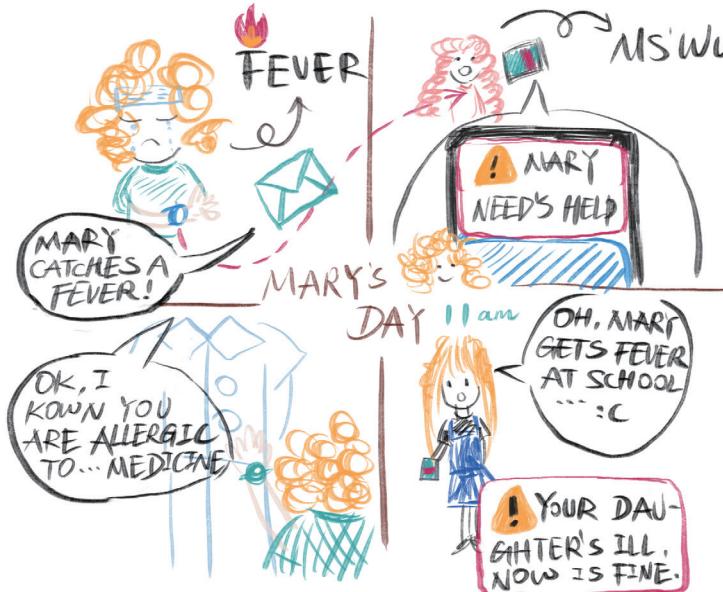


BOLAN

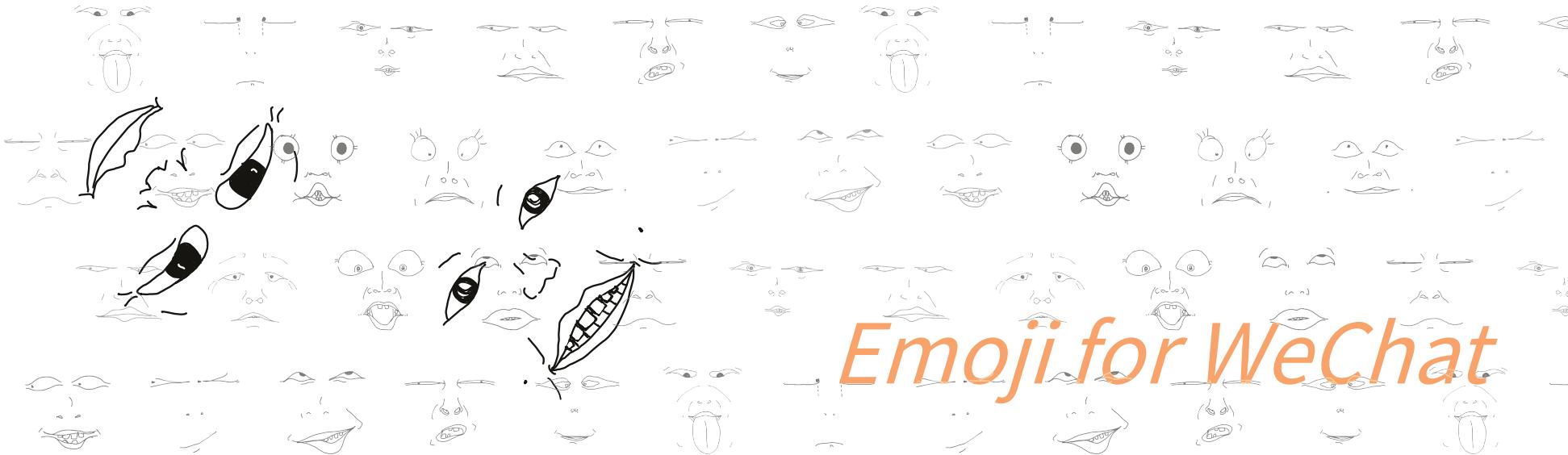


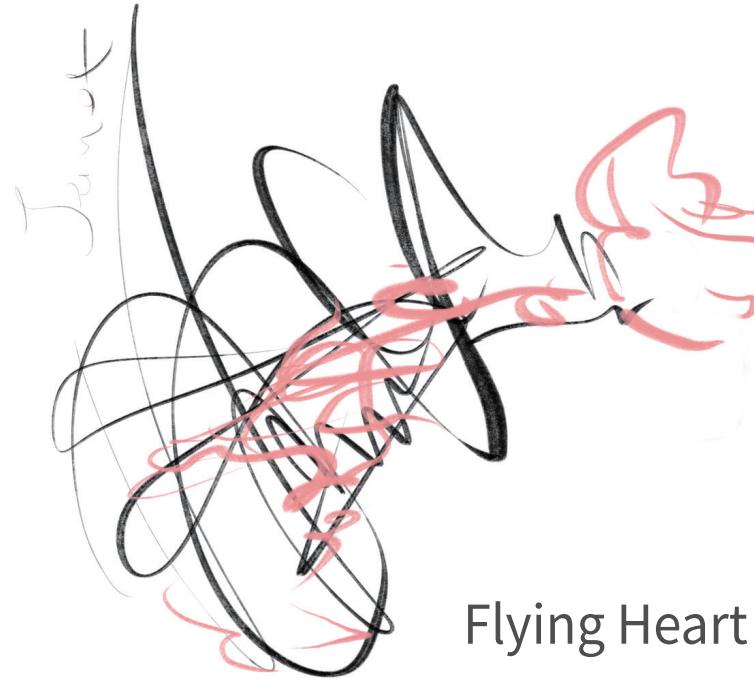


Mary's day



Emoji for WeChat





Line Pictures

The Robot



The End