

# Empowerment ICT Platform for Health Behavior Security

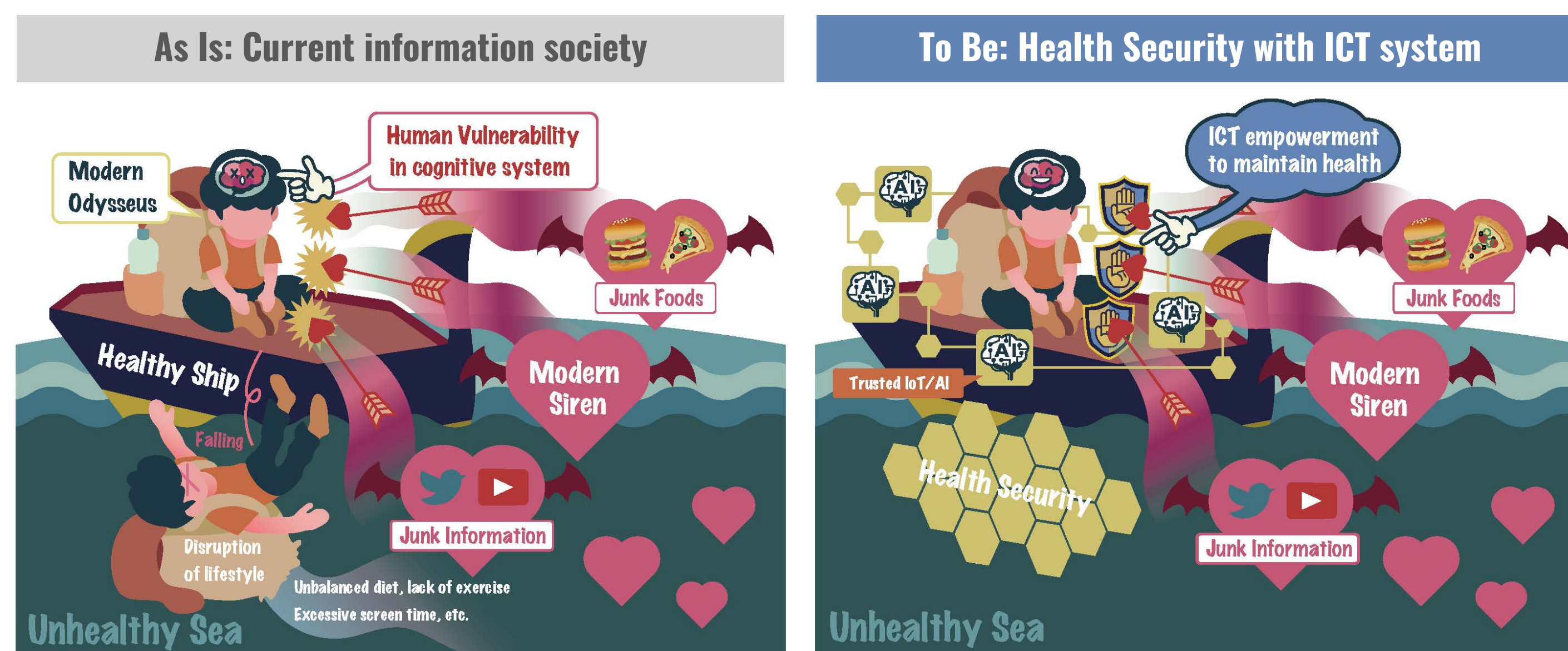
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## Project Challenge

This project aims to promote healthy behaviors in an era where information overload and temptation abound due to the rapid development of information technology. Modern society is saturated with unhealthy temptations, such as addictive digital content, that our primitive cognitive systems are ill-equipped to handle. The project seeks to mitigate these challenges by equipping individuals with the skills to navigate these temptations and make healthier choices through effective information delivery.



## Intellectual Merit

This project is committed to advancing ICT technologies and methodologies that enable individuals to maintain and re-establish healthy habits in a world full of unhealthy temptations.

Key aspects of the initiative include:

- (1) Treating healthy behaviors and lifestyles as essential assets,
- (2) Recognizing human cognitive and preference biases as key vulnerabilities,
- (3) Countering information that encourages unhealthy behavior as a significant threat.

The concept of "health behavior security" is critical to designing information that helps individuals skillfully navigate the complex web of modern deception.

## Broader Impact

This project promotes informed decision-making, benefits public health and reduces costs, and aims to create a society less vulnerable to unhealthy temptations through improved information literacy. It targets health professionals, policy makers, and individuals interested in wellness.

## Future Goals

The next year will focus on developing and testing ICT tools and programs to promote healthy choices. Expected outcomes are increased awareness of healthy behaviors, adoption of practices, and improved community health behaviors.

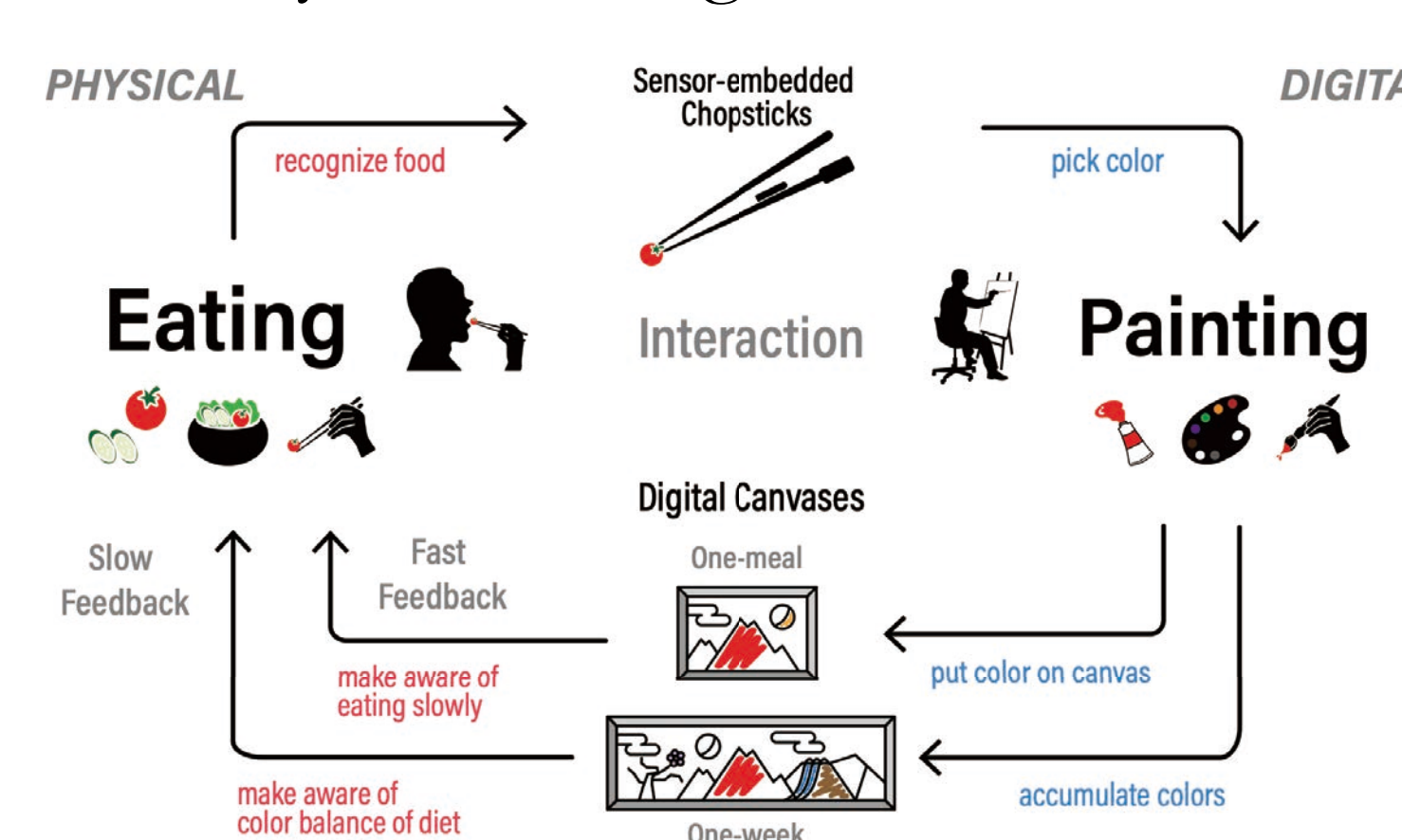
## Research Progress 1 : eat2pic project

**Background:** Traditional methods of promoting healthy eating often don't engage the psychological aspects of meal choice.

**Motivation:** To create an engaging, reflective way for users to think about their eating habits and meal choices.

**Challenge:** Changing complex human eating behaviors and encouraging a balanced diet and slower eating in a visually stimulating manner.

**Approach:** Utilizing visual stimuli by transforming meal selection into coloring landscape images, leveraging sensor-equipped chopsticks and digital canvases to encourage mindful eating and dietary diversity.

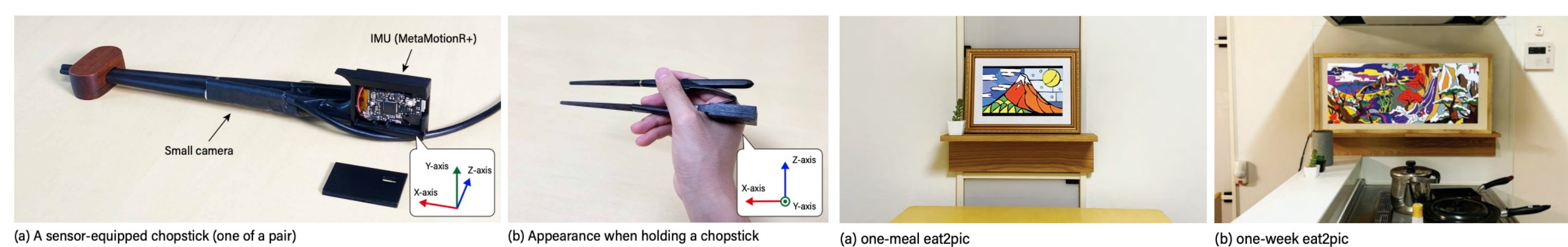
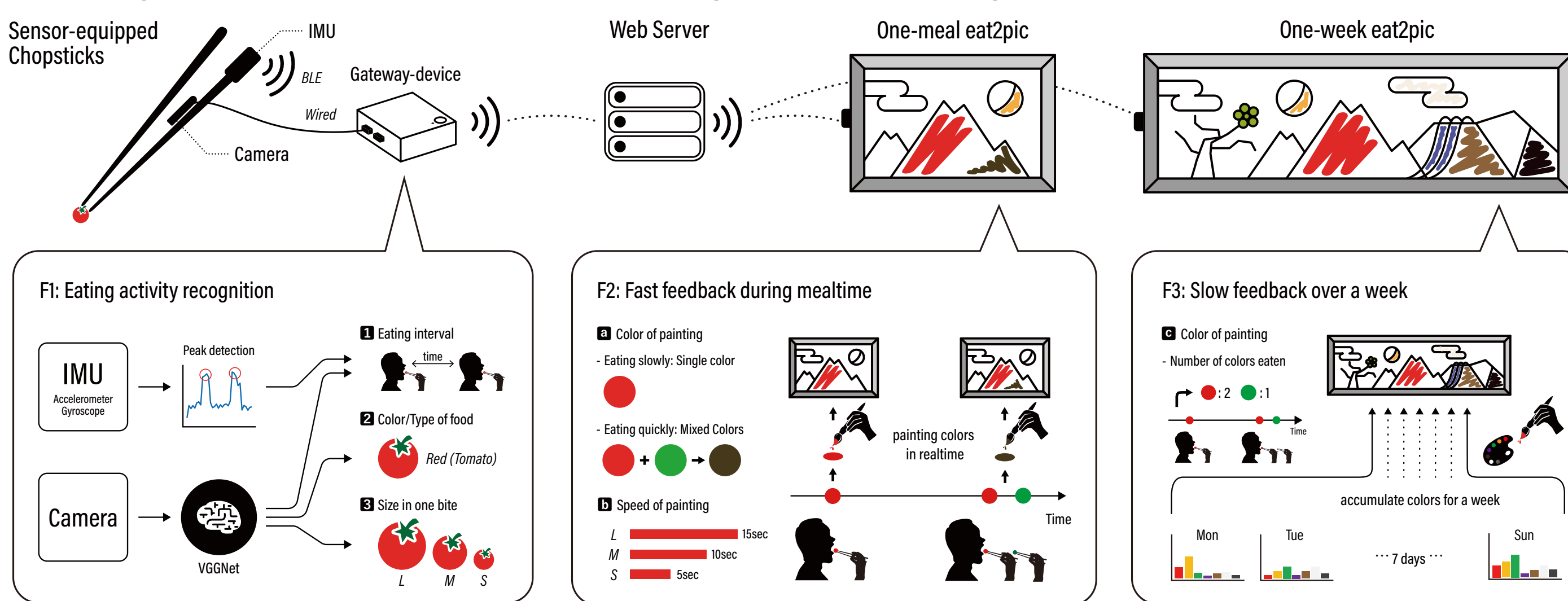


### Use Case Scenario of eat2pic

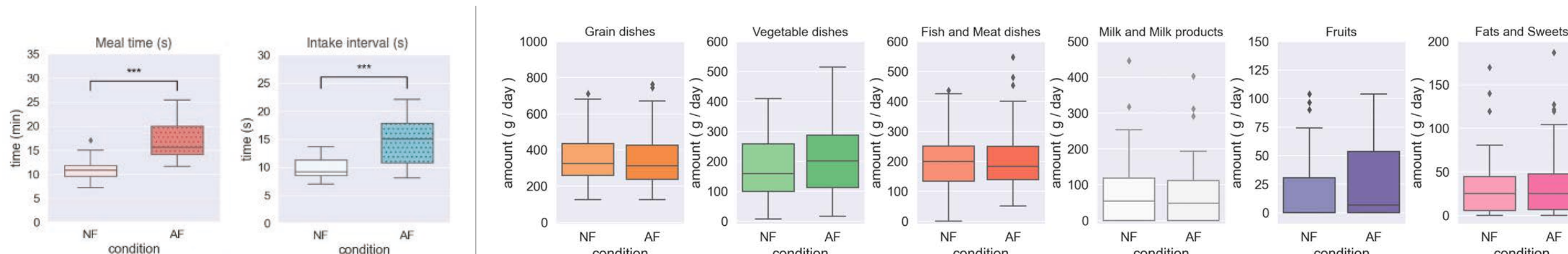


### System Design and Implementation of eat2pic

The eat2pic system provides two functions: (1) automatic diet tracking of how the user consumed each mouthful of food and (2) ambient visual feedback with stylized painting representations of eating habits describing the user's behavior in terms of each single meal and over a given week.



### Evaluation Results



Confirmed the effect of preventing fasting with one-meal eat2pic (N = 20).

Observed a trend toward increased awareness of color balance in the diet and increased intake of fruits and vegetables with one-week eat2pic (N = 30, over a period of 1 month).

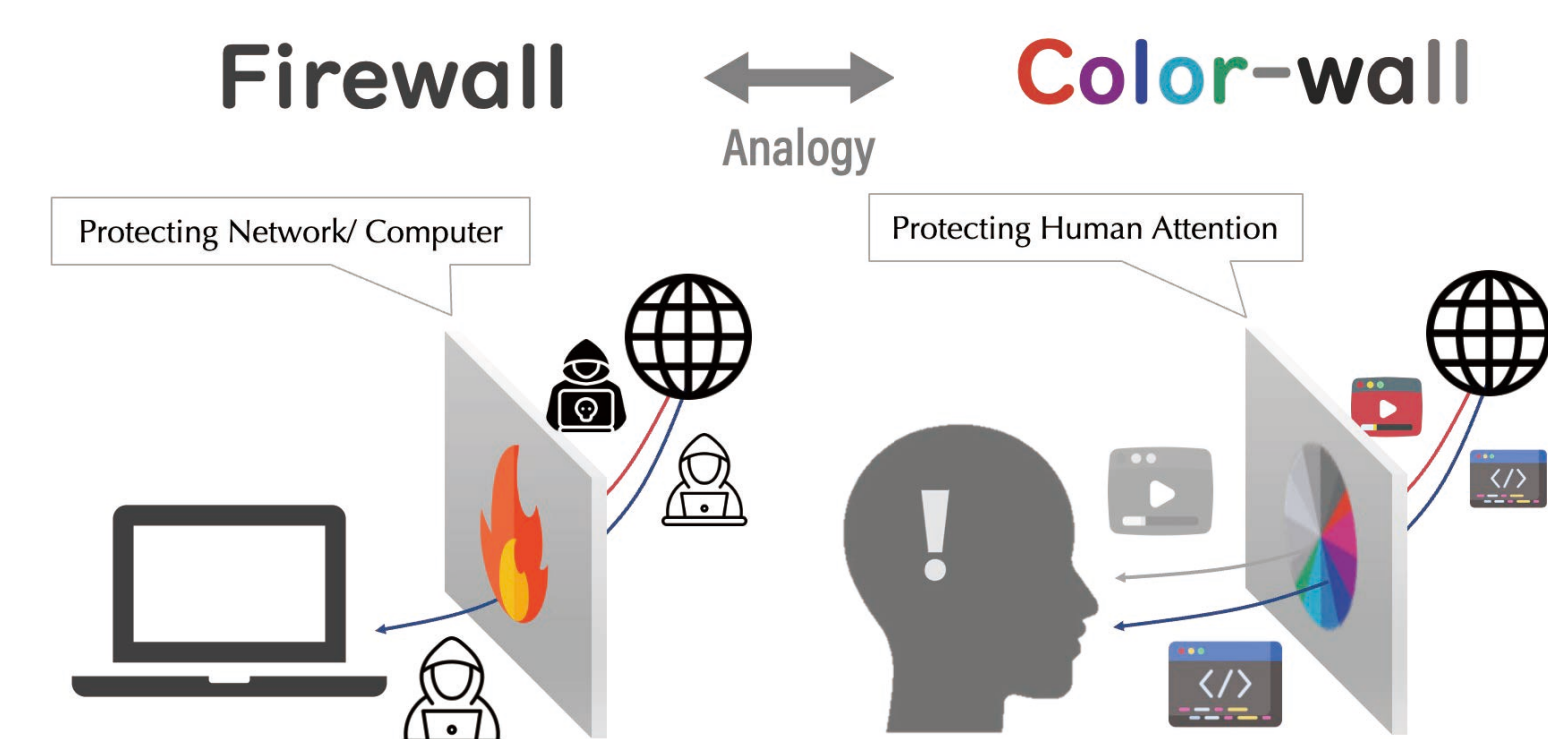
## Research Progress 2 : color-wall project

**Background:** The Attention Economy exploits color psychology to capture and retain user attention, contributing to digital distraction.

**Motivation:** To find a defense against the overwhelming digital distraction by diminishing the visual appeal of seductive digital content.

**Challenge:** Counteracting the pervasive distraction in digital environments without diminishing the utility of digital devices.

**Approach:** Implementing a system that grayscales distracting content on screens, using color psychology to redirect user focus towards primary tasks and reduce digital engagement with non-essential media.



### Use Case Scenario of color-wall



### Large-scale evaluation of color-wall strategy

**Experimental Field**

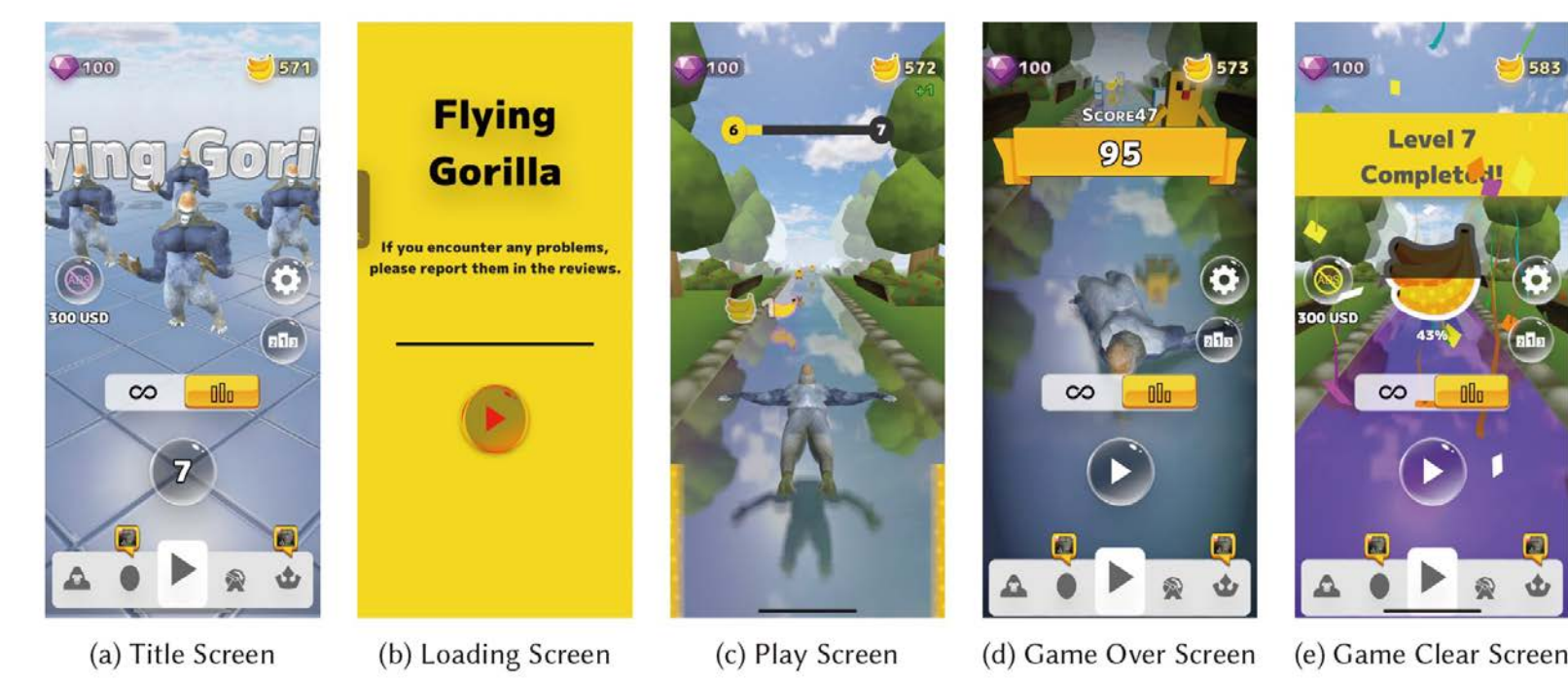
**Game:** "Flying Gorilla"

**Type:** Endless runner game

**Active User:** Approximately 200,000 people

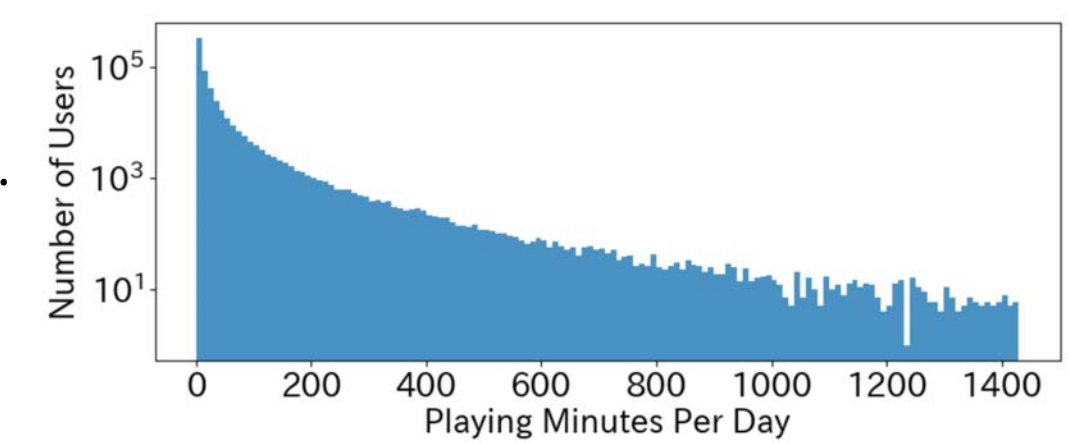
**Platform:** iOS & Android mobile game app

"Flying Gorilla" is a mobile game where players navigate an endless runner environment by controlling a gorilla to collect bananas and avoid obstacles through swipe or tap controls.



**Distribution of user engagement time from March to May 2023**

The right figure shows that some users play for longer periods of time. 16,107 users (6.61% of total) played for over 120 minutes per day, 6,941 users (2.85% of total) played for more than 240 minutes daily.



**Experiment Details and Evaluation Metrics**

**Number of participants:** Approximately 30,000 users

**Duration:** 2 months

**Conditions:** Users were randomly divided into two groups

- Control Group: Regular version

- Experimental group: Grayscale version

**Evaluation metrics:**

- App usage intervals (retention rates for 1 day, 2-3 days, 4-7 days)

- Playtime (average daily playtime)

**Results Summary**

**Retention Rates:** Users in the grayscale group showed a decrease in retention across all intervals compared to the control group:

- 1-day retention rate decreased by 13.6%.

- 2-3 day retention rate decreased by 15.8%.

- 4-7 day retention rate decreased by 12.3%.

**Playing Time:** The average daily playing time was lower in the grayscale group:

- Color Version: Average 6.07 minutes, SD 20.45.

- Grayscale Version: Average 4.49 minutes, SD 11.63.

|                        | Decrease Rate in Grayscale Version |  |
|------------------------|------------------------------------|--|
| 1 day retention rate   | -13.6%                             |  |
| 2-3 day retention rate | -15.8%                             |  |
| 4-7 day retention rate | -12.3%                             |  |

|                   | Average (min) | Standard Deviation |
|-------------------|---------------|--------------------|
| Color Version     | 6.07          | 20.45              |
| Grayscale Version | 4.49          | 11.63              |

