# Introduction of AI cloud service to light crayon

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Introduction

In recent years, application of new information technology such as AR (augmented reality), gamification and image processing in the amusement field is progressing. Our laboratory develops "light crayon system" using image processing technology .
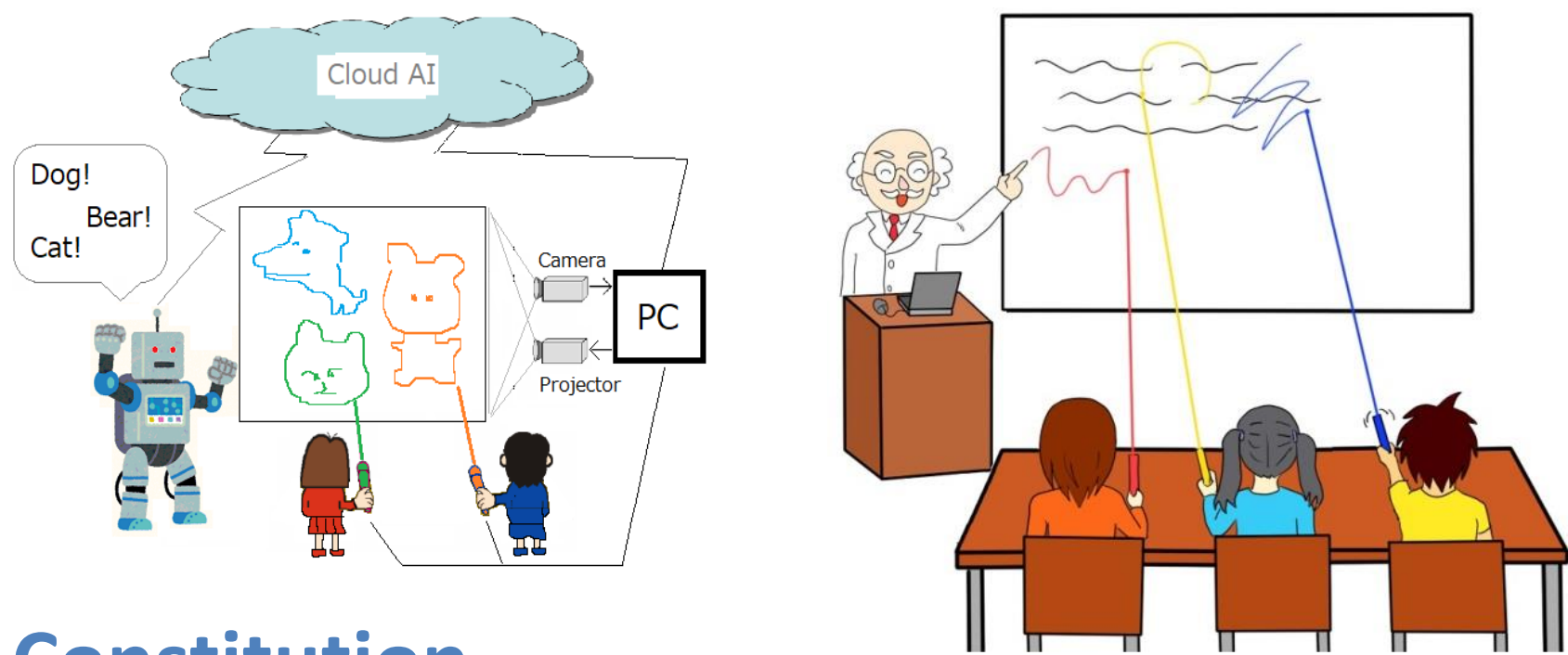

Constitution

This system mainly consists of light pointer, PC, camera, projector, screen. The light pointer is a device corresponding to a brush. By holding this light pointer in front of the screen, you can draw lines freely. This system is not merely tracking the trajectory of the optical pointer and the drawing with the projector. We are trying to implement two functions to enhance amusement. First, it is the distinction between the drawers. In other words, it is a function to have the drawing person attribute for the tracked track. The other is to return an interactive response to the drawing content.
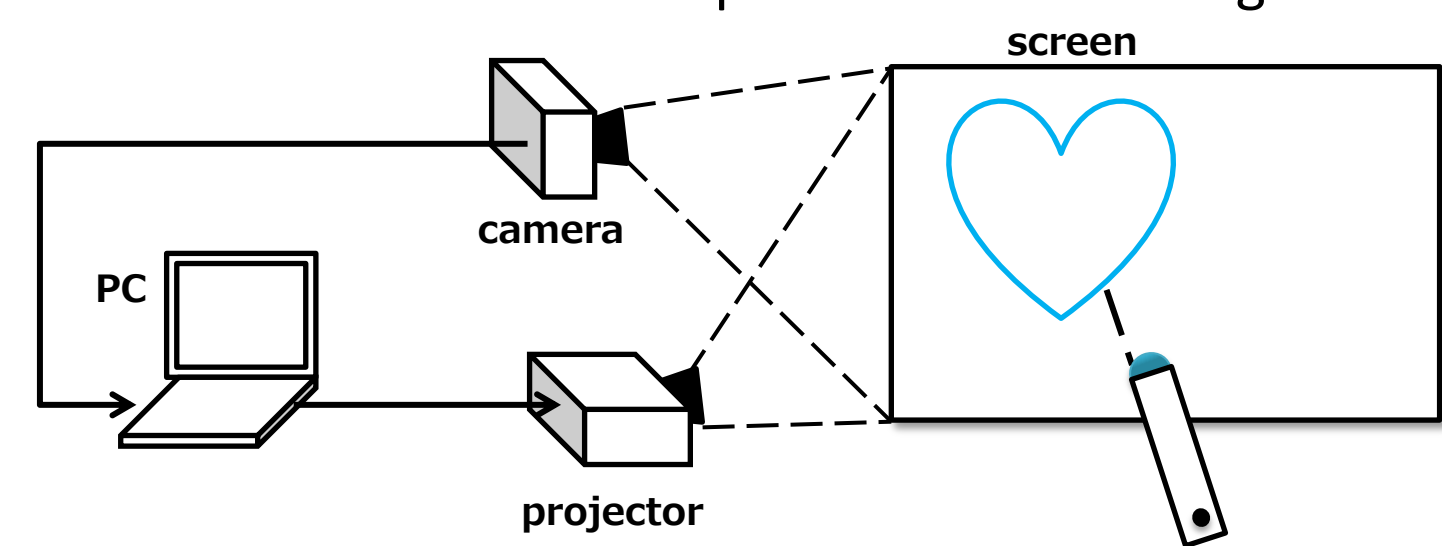
## Introduction of recognition system by cloud service

We use "Custom Vision" which is the image recognition service of "Microsoft Cognitive Services". This is a service that can create a custom image recognition engine using images prepared by the users, and call it from the Web API.
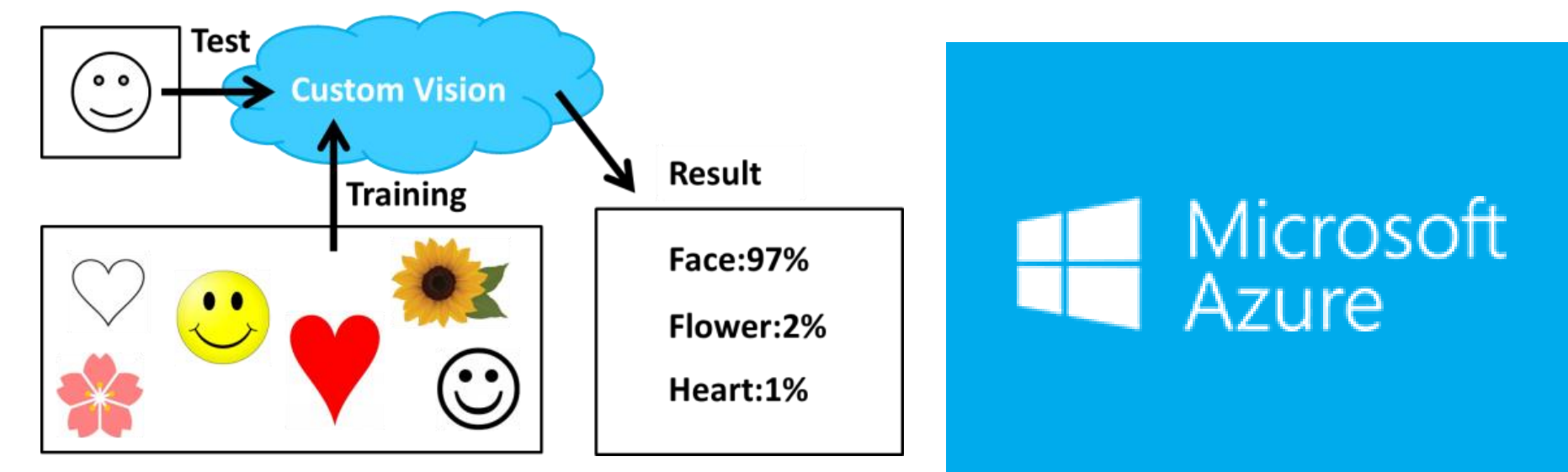

Preliminary experiment

First, a program for identifying images prepared by himself / herself to Custom Vision was constructed in Visual Studio using C#. In Custom Vision, we train the images of face, heart and flowers beforehand, and the result of reply in which the image of the face is identified by Custom Vision is shown in Fig.
In this recognition example, the recognition result was 0.99937655 for "face", 0.0016693566 for "heart" and 1.22087741 × 10 - 7 for "flower".


face6.jpg
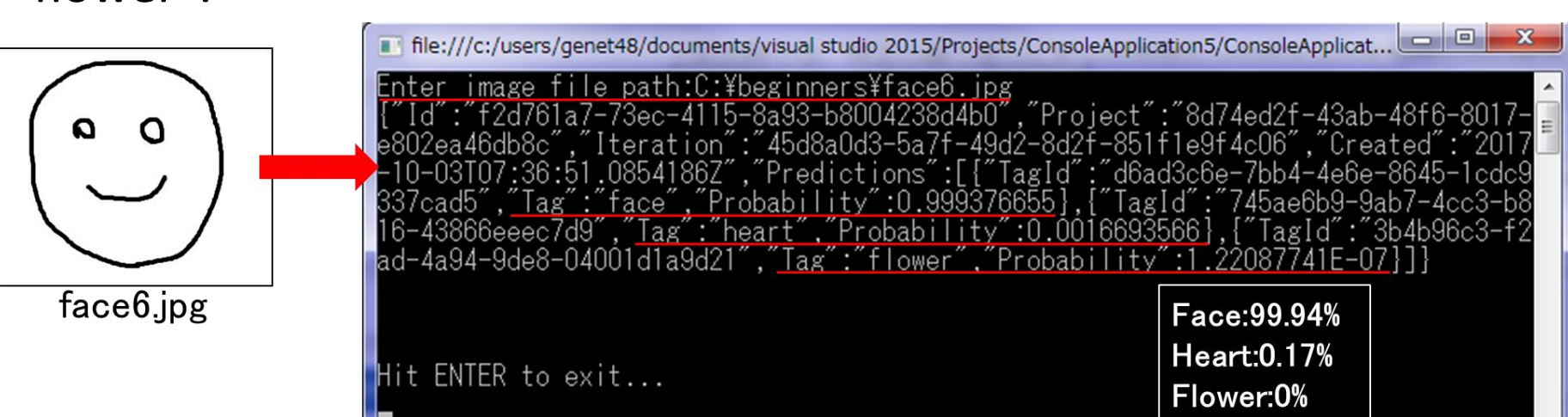
Equipped with image judgment system

We drew a picture of a face with a light crayon system, photographed using a USB camera, and the image taken was judged by Custom Vision Service and evaluated. In addition, we prepared a sound file of each tag beforehand and constructed a system to hit the picture drawn by reproducing the sound file of the tag with the highest evaluation by Custom Vision Service.
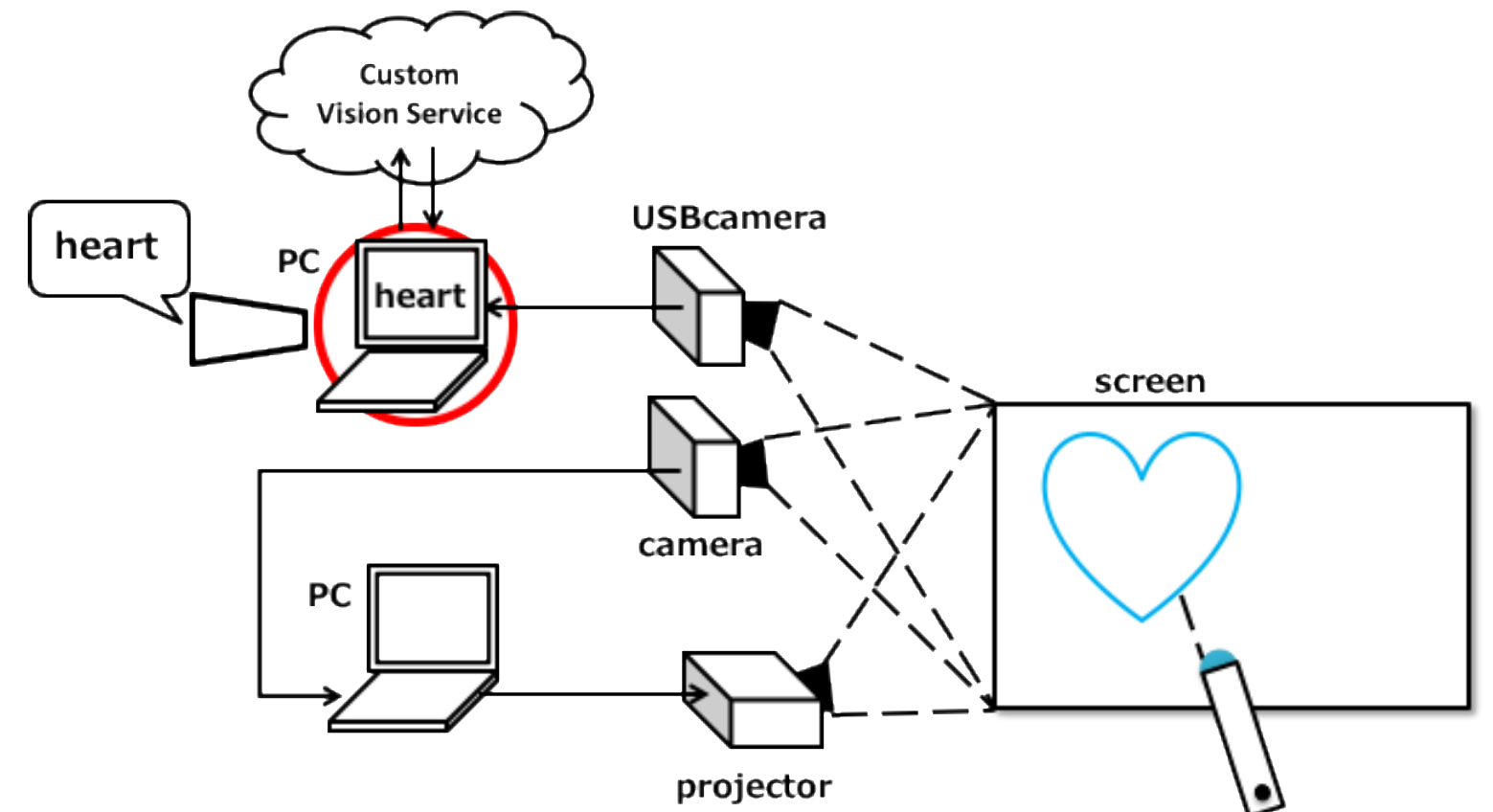
Results

The Custom Vision Service was trained and evaluated to identify faces, triangles, and squares. I participated in "the Keihanna Science Experience Festival" and conducted a questionnaire. We compare it with the questionnaire result of the light crayon system before loading the image processing system of USB camera and consider it.

Before

■ strongly agree ■ agree ■ disagree ■ strongly disagree

After
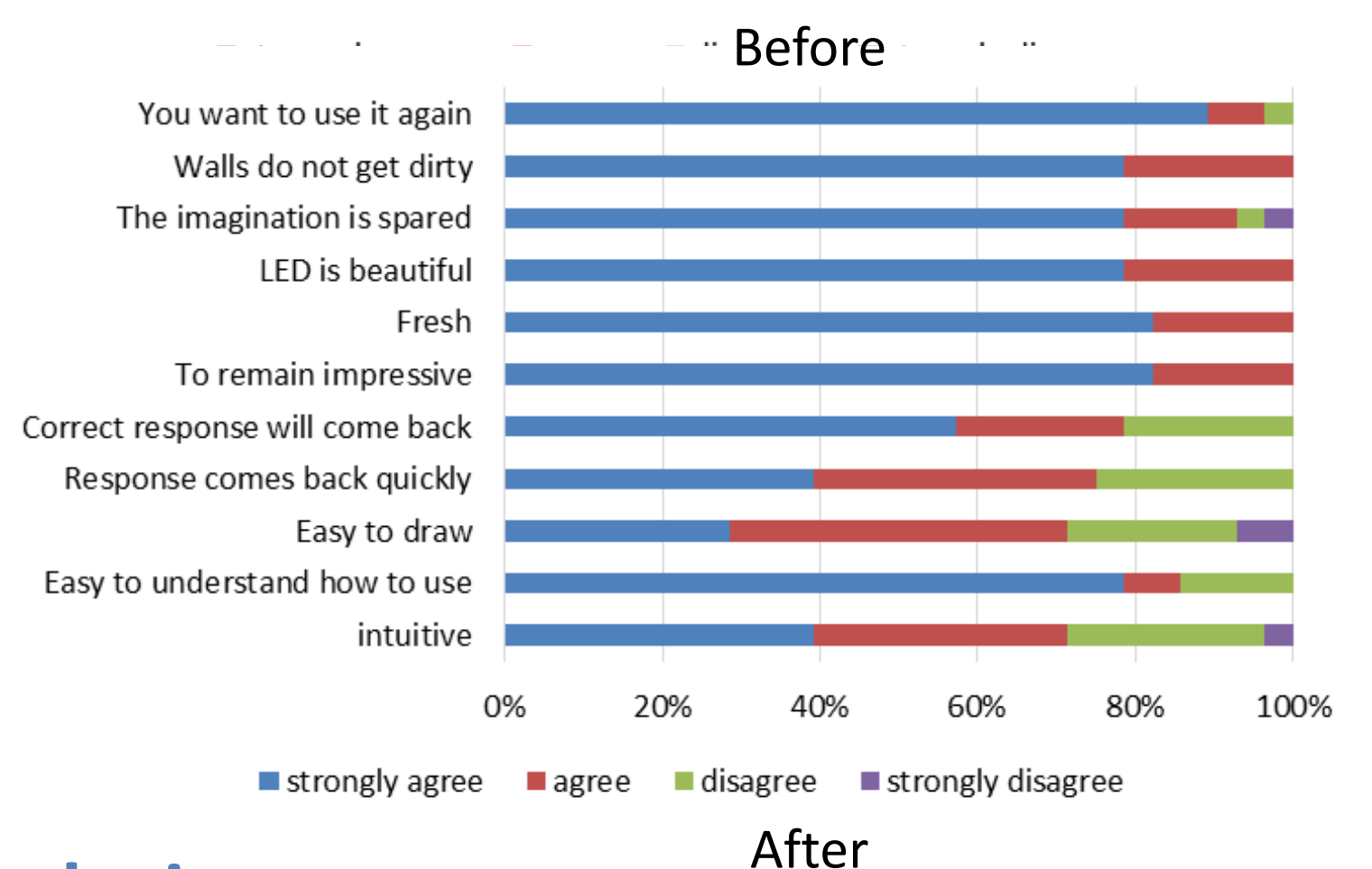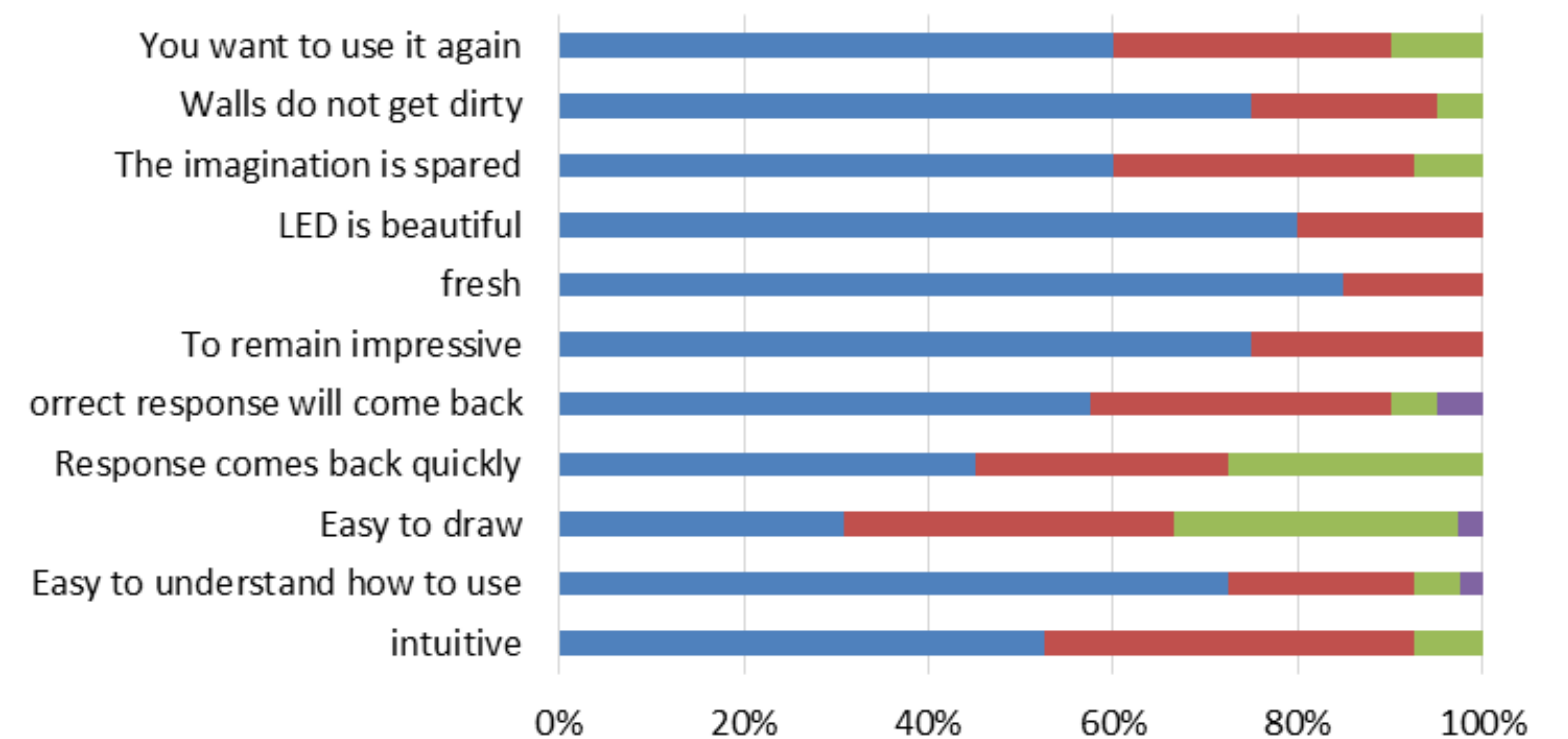
Conclusions

We have constructed a system that make the pictures drawn by the light crayon system recognized in real time continuously by Custom Vision and outputted by voice. As a result, the amusement property greatly improved. And, we try to three-dimensional visible the light pointer's trajectory.