Time Using and Exercise Helper in Daily Life

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Abstract—In modern times, people work hard every day with busy life. From morning to night, live their time as busy as bee. Forgetting live their lives as a mortal. As a result, we want to do something for them to remember living their real live with exercising, with many trivia.

I. INTRODUCTION

To achieve our goal of making something to improve people's life habits, we want to build a system with many different type of sensor to detect the data of people's exercising and then send them to a device such as cellphone, to let people can control their exercising easily and conveniently. Hence get a healthy body and better life.

II. BACKGROUND

a) Kinect

Kinect is a device including 3 cameras that can detect the 3D vision and with speaker that can detect voice developed by Microsoft. It is used as the Vision detecting and gesture training part in our project.

b) Arduino

Arduino is an open source hardware and software system that can connected with many sensors and usually used as the illuminate kit of learning system engineering. It is used as the wearable device part in our project.

c) App Inventor

App Inventor is a graphic interface app developing software for Android app. And it was developed by google, and now serviced by MIT. It is used as the platform of building user interface in our project.

d) Open CV

Open CV (Open Source Computer Vision Library) is an open source that are used to do image processing and Machine Vision. It is used as the vision monitor in our project.

e) Dropbox & Web Scraping

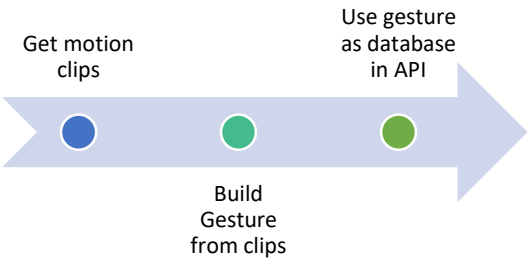
Dropbox is a cloud drive that can connect with the folder in computer, so that it can make the data transmission more convenient. We also use the technique of web scraping to get the data from Dropbox for our app.

III. METHOD

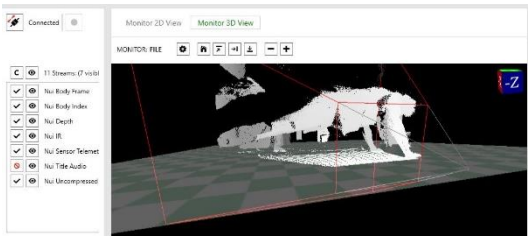
a) Vision Detecting

In this project, we use visual detecting to detect the motion of workout with

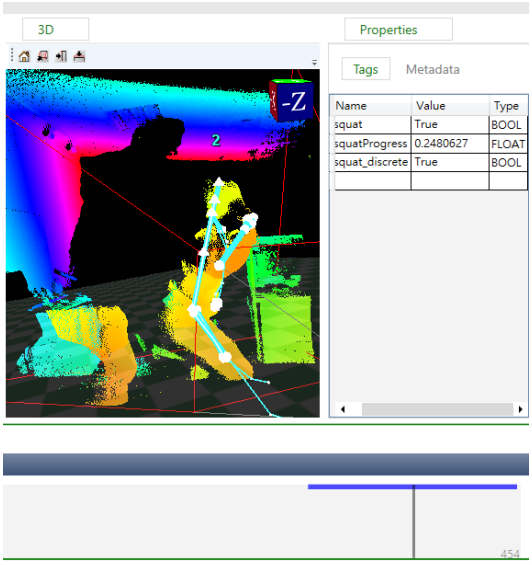
Kinect API.



In the beginning, we use K studio to record the clips of our motion.



Then, we use visual gesture builder to choose the clips we want and the build it as the database.

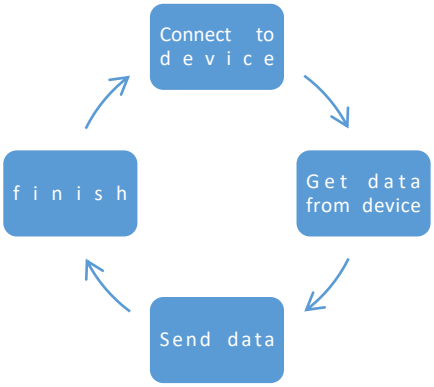


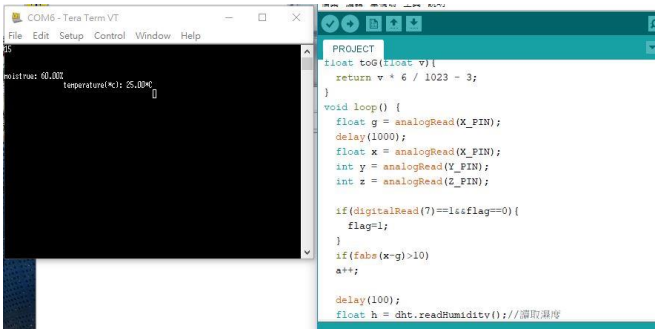
At last, we use those databases in the program as the data to recognition the degree of certainty of the motions user do with the database and then counting how many times user do the specific motion.

```
if (pGestureResult->get_Progress(&fProgress) == S_OK)
{
    if (squat.success != true)
    {
        if (fProgress > 0.6f)
        {
            // output information
            wcout << L"Detected Gesture " << sName << L" " << fProgress << endl;
            cout << "successful!!!" << endl;
            file = fopen("C:\\Users\\user\\Dropbox\\test.txt", "w");
            squat.count++;
            fprintf(file, "squat : %d\n", squat.count);
            fclose(file);
            squat.success = true;
        }

    }

    else if (squat.success == true)
    {
        if (fProgress < 0.5f)
        {
            cout << "motion end" << endl;
            squat.success = false;
        }
    }
}
```

b) Wearable Device

In this project, we utilize two sensors to get data to represent our situation. One is Temperature and humidity sensor, another is Pedometer. Besides, we need to enter data into text because the app can read data. We use program, which called Tera Term. Tera Term can get data from communication port and enter data to text. Therefore, we can see data will be revealed in text.



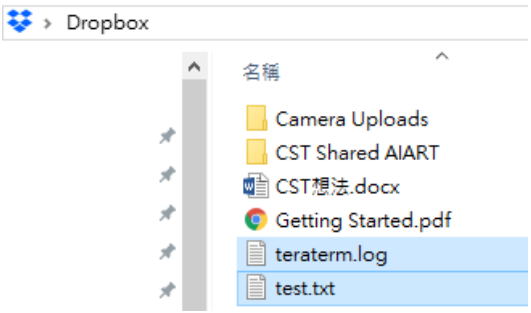


c) Reminder

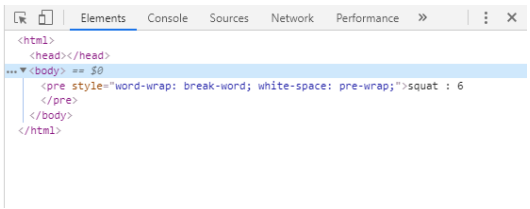
We use the text file in the mobile recording data and the check box function in app inventor getting data to build the reminder.

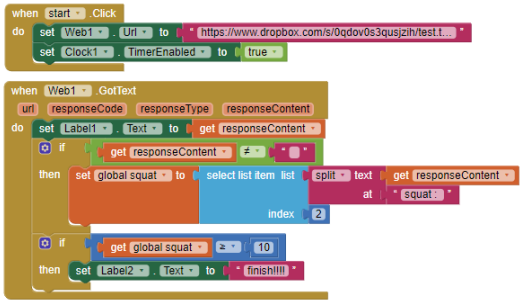
d) Data Transmission

We first use Dropbox as a media to store data we have got from C++ program of Kinect API and from Arduino Sensor.



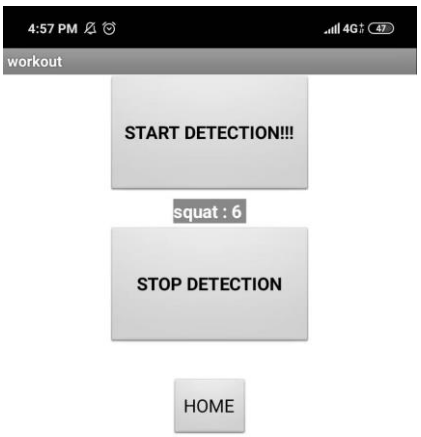
Then we use the web related functions in app inventor to get the data we have stored in the Dropbox by scraping the text in the HTML.

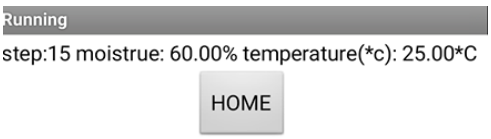




IV. RESULT

In our final system, it will connect the Arduino, Kinect and our app as a system that can use vision detector to detect the workout motion that user has done, use Arduino with Gyro sensor to detect the steps that user has run. Finally, it can let users see the result of their hard exercising. They can also keep the goal they want to reach in the reminder to urge themselves.





V. CONCLUSION

To build this system, we use the concept of wearable device to make our sensor, and use Kinect to detect our motion. In modern society, many people have their own wearable devices to wear. So we hope one day we can improve our system all to wearable devices without large devices. Also, we look forward to having more and more functions which not only embedded in system but can be used to make our everyday lives more and more convenient.

VI. REFERENCE

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