American International University-Bangladesh (AIUB)

Department of Computer Science and Engineering
Faculty of Science &Technology (FST)
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CSC4182 – HUMAN-COMPUTER INTERACTION

Section: A

Project Title: Real-life game controller system controlling with the body.

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❑ Introduction

Real-life game controller system controlling with the body the Chrome Dinosaur Game is a hidden game in the Chrome browser that you can play when the internet goes down. The objective of this game is to simply avoid obstacles by jumping. By hopping when you do, this gadget may control the dinosaur game in real life. It accomplishes this using an Arduino Leonardo because it supports the Keyboard library and a force-sensing resistor to detect hopping. This report presents a tangible user interface Real-life game controller system Chrome Dinosaur Game that is controlled by Arduino and is used for avoiding obstacles by jumping.

❑ Project Background

➢ Identification Of problem

People of all ages, from children to the elderly, are dependent on technology in today's modern world due to its constant growth. This is true for a variety of reasons, including business, entertainment, and a myriad of other uses. In fact, modern life is impossible without the use of technology. Children and elderly adults are constantly seated or standing in the same location, using their hands to control computers or mobile phones for their own purposes. Most of the time, we spend hours fixed to one spot, like a statue, in the same position, using technology compulsively for our own work or enjoyment without moving a single muscle or being aware of the myriad events taking place all around us. As movement causes our blood to circulate in a constant stream inside our bodies, which is beneficial to us as it maintains us healthy, being stale and not adhering to the movement for hours can produce many detrimental long-term problems in our body. Thus, inactivity prevents blood from flowing continuously, which can result in extreme discomfort throughout the body and possibly paralysis, heart obstructions, and heart attacks. Children's bodies experience numerous damaging inside issues as a result of irregular blood flow. The fact that persons with particular disabilities find it considerably harder to get over their incapacity to click buttons in order to utilize their technology is another issue

with using hands and pushing buttons to control technology. As a result, they are unable to get the gratification of using the technology themselves in this situation and typically have someone else use it for them. The fact that we can't immediately get our technology to perform what we want it to when we click a button to use it presents another challenge. The technology must process the user's instructions after we press a button to command it, and then it must wait a specific amount of time before performing the task we have given it. Modern human minds and the functioning of our technology cannot be synchronized. When pressing buttons to control technology, our ability to be flexible in our interactions with it falls short of expectations.

➤ Background study

Human-computer interaction enables the communication between people and machines (HCI). A method for further fusing the physical and digital worlds is the tangible user interface, or TUI, which imbues digital data with a palpable quality. Physical objects known as tangible user interfaces (TUIs) are able to convert user actions into events that are fed into a computer interface. User interfaces and interaction techniques that highlight the tangibility and naturalism of the interface are generally referred to as "tangible interaction." Now we can easily find it in a variety of real-world applications, including virtual reality, gaming, robots, sign language recognition, etc. Possibility of a natural method of human-technology interaction with the tangible user interface. In order to leap into the Chrome Dinosaur Game, we want to create a device that can jump into real life. It accomplishes this using an Arduino Leonardo to detect jumping and a force-sensing resistor. Finally, the systems under consideration benefits and drawbacks are discussed.

➤ Goals

Our game-controlling mechanism will be based on physical interaction. When the need arises for the game, both we and it will jump into real life. Jumping is the only way to dodge obstacles in this game. It accomplishes this using an Arduino Leonardo because it supports the Keyboard library and a force-sensing resistor to detect hopping. We are going to build a game-controlling system with help of the body interaction.

❑ Methodology

All of the codes needed to create this real-world game controller system game were created and run in the Arduino IDE. Any age group can play this game. The game is a lot of fun to play and watch.

➢ Methods & tools

Method:

1. Using the schematic from the "Schematics" section at the bottom of the page, construct the circuit.
2. Upload the code that is located in the "Code" section on the page's bottom.
3. Modify lines 3 and 4's threshold values.
4. (Optional) 3D print and attach the belt clip from the "Custom Parts and Enclosures" section at the bottom of the page.
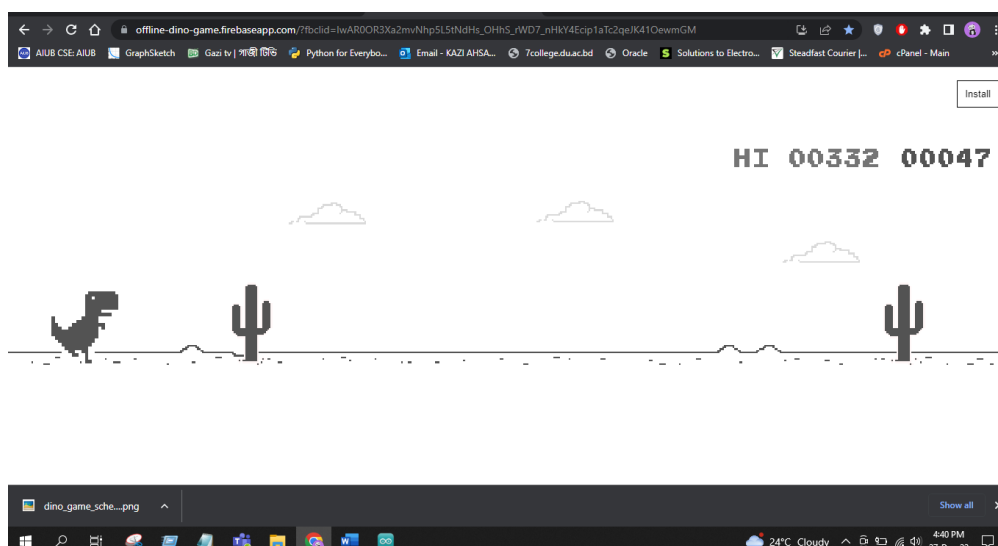5. Plug in the device then launch Chrome to start the game!

Tools are the following:

1. Arduino Leonardo
2. Force Sensing Resistor
3. Resistor 10k ohm
4. Jumper wires (generic)
5. Sandale
6. Wires
7, USB Cable
8. Buzzer
9. Switch

➢ Implementation planning
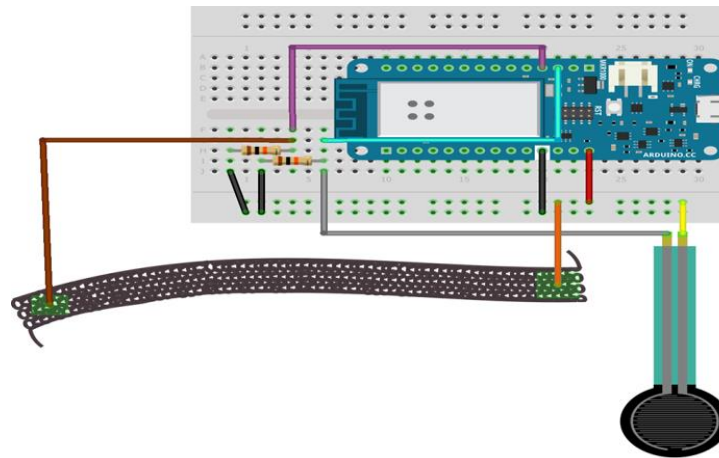
➢ Implementation

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File Edit Sketch Tools Help

Arduino Leonardo

Dinosor_Game_Controller.ino

```
1    #include <Keyboard.h>
2
3
4    const int switchh = 2;
5    const int buzzer = 6;
6    int buttonState = 1;
7
8    int forceThreshold = 900;
9
10   void setup() {
11
12
13     Keyboard.begin();
14     Serial.begin(9600);
15
16     pinMode(switchh, INPUT);
17     pinMode(buzzer, OUTPUT);
18
19     digitalWrite(switchh, HIGH);
20     digitalWrite(buzzer, LOW);
21
22   }
23
```

Output

File Edit Sketch Tools Help

Arduino Leonardo

Dinosor_Game_Controller.ino

```
22   }
23
24   void loop() {
25
26     buttonState = digitalRead(switchh);
27     //  Serial.println(buttonState);
28
29     int forceValue = analogRead(A2);
30     Serial.print(" force: ");
31     Serial.println(forceValue);
32     //Serial.print(" force: ");
33     //   Serial.println(buttonState);
34
35     if (buttonState == 0) {
36
37       if (forceValue > forceThreshold) {
38         Keyboard.press(' ');
39         //      Keyboard.println("How are u?");
40         digitalWrite(buzzer, HIGH);
41         delay(500);
42
43       }
44       else {
```

Output

File Edit Sketch Tools Help

Arduino Leonardo

Dinosor_Game_Controller.ino

```
37       if (forceValue > forceThreshold) {
38         Keyboard.press(' ');
39         //      Keyboard.println("How are u?");
40         digitalWrite(buzzer, HIGH);
41         delay(500);
42
43       }
44       else {
45         Keyboard.releaseAll();
46         digitalWrite(buzzer, LOW);
47       }
48
49     }
50     else {
51       Keyboard.releaseAll();
52       digitalWrite(buzzer, LOW);
53     }
54
55     Keyboard.releaseAll();
56     digitalWrite(buzzer, LOW);
57
58   }
59
```

Output

❑ Result

The game ran very smoothly. It is very fun for kids. All ages people can experience that game. People can do their exercise with this game. A wonderful technique to get people moving in today's society is through tangible user interfaces because people are too reliant on technology and too unwilling to leave their homes.

❑ Discussion

➢ Findings

There are no major findings in our Real-life game controller system game but if you don't jump before the delay time which is set on the Arduino Ide code it might jump earlier. Always need to flat your feet in the forcing sensor which is in the Sandle.

➢ Analysis

The ability of the heart and lungs to supply oxygen to your muscles is improved by a regular jumping routine. Your heart and circulatory system benefit from the rise in heart rate and pulse. It is regarded as one of the best activities for maintaining heart health. Jumping is a coordinated, demanding action that enhances bone density while fostering motor planning, balance, muscle development, and coordination. If anyone plays that game for 20 minutes it will very helpful for his health.

❑ Conclusion

➢ Recommendations

Real-time enjoyable workout including jumping and bouncing. Both the intellect and the muscles are strengthened by it. Children who participate in such activities are consistently seen to be happy. Such children also do well in school. Your child's thinking becomes balanced as a result of jumping. Even under dire circumstances, he maintains his happiness and composure, which makes his recall and grasping ability superior to others. Playing this real game-controlling system tangible game is recommended for all types of people who can want to lead a happy and healthier life.

➢ Conclusion

The real-life game controller system controlling the body of Chrome Dinosaur Game has been executed properly. We are all aware that nothing in this world is perfect, and our works have some flaws. But our game has many benefits. Those benefits are really helpful for mankind. All age groups can benefit from jumping. It's more of a game for youngsters than a way to keep them active.