REALTIME GAMING TO STAY FIT GoFit

Minor Project - 2

Under the supervision of
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Problem Statement
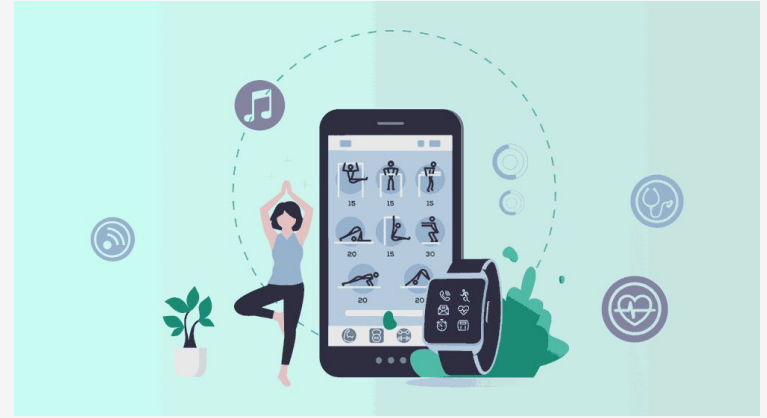
We all stay inside our homes and it's hard for people to exercise or workout.

Staying physically healthy is the most important thing right now in this situation.

On top of this, you keep procrastinating to get up from the bed and then never actually work out.

Staying healthy and fit shouldn't be this hard.

Solution

✓ GoFit is subway surfers like game where you control the player by actually jumping, moving left and right in your real world.

✓ We built a mobile application which detects motion by using accelerometer and gyroscope sensor which is developed by flutter (dart language) whose input are pushed by firebase to the interface (webpage) which is developed using HTML, CSS and THREE.js

Scope of the project
Global

Could be scaled to millions of people, world-wide.

The global scope of a game that facilitates user's physically active lifestyles would be focused on creating an engaging and motivating experience that encourages users to incorporate physical activity into their daily lives.
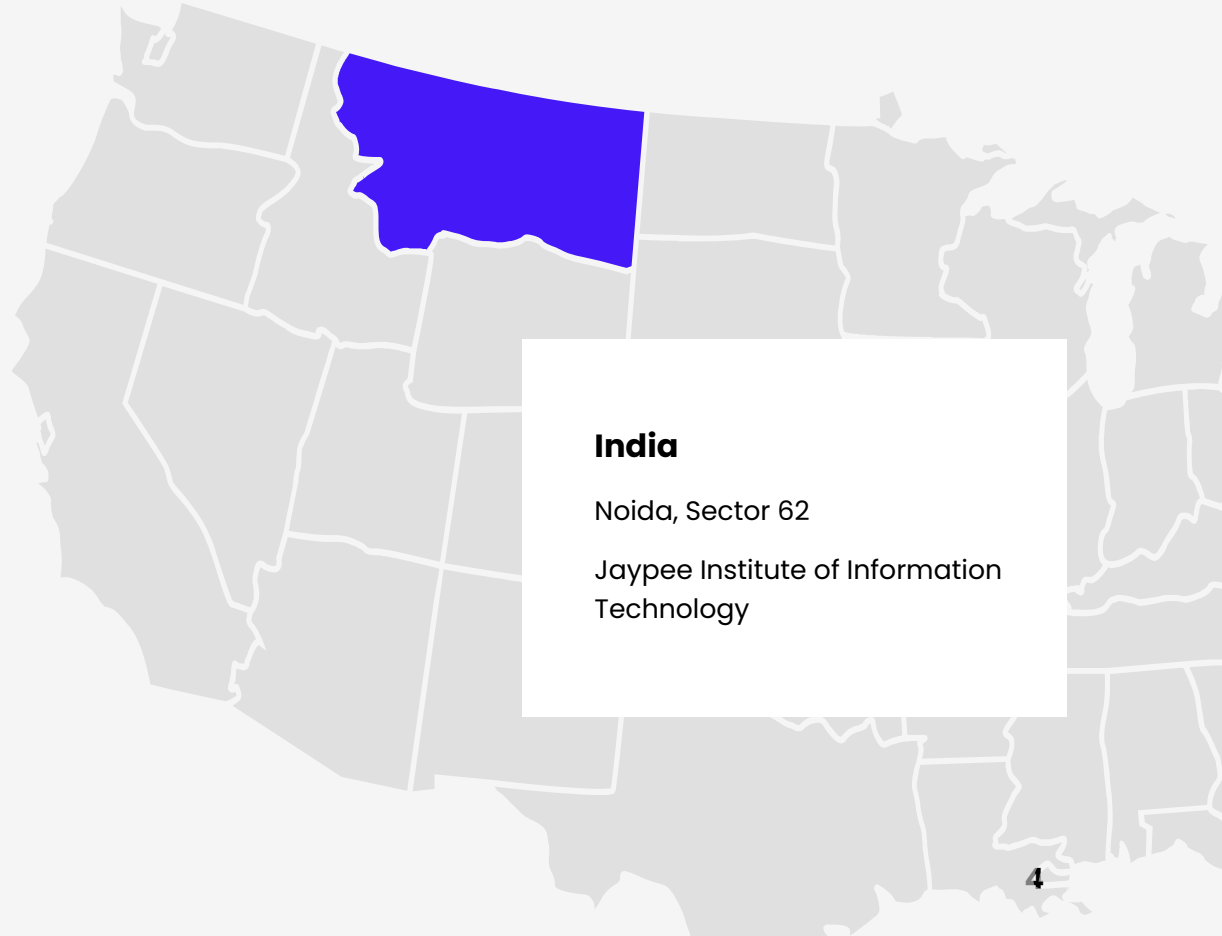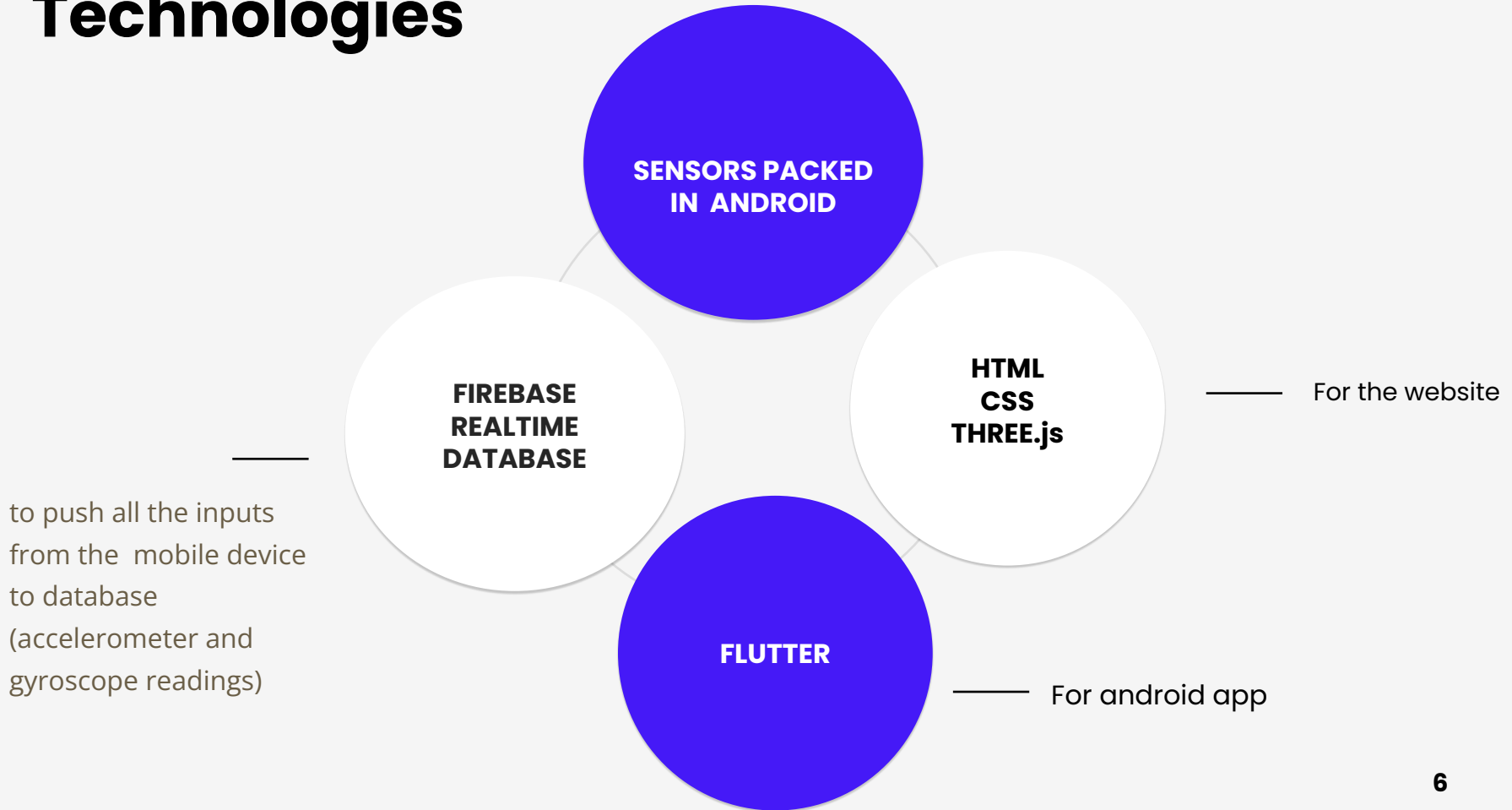
India

Noida, Sector 62

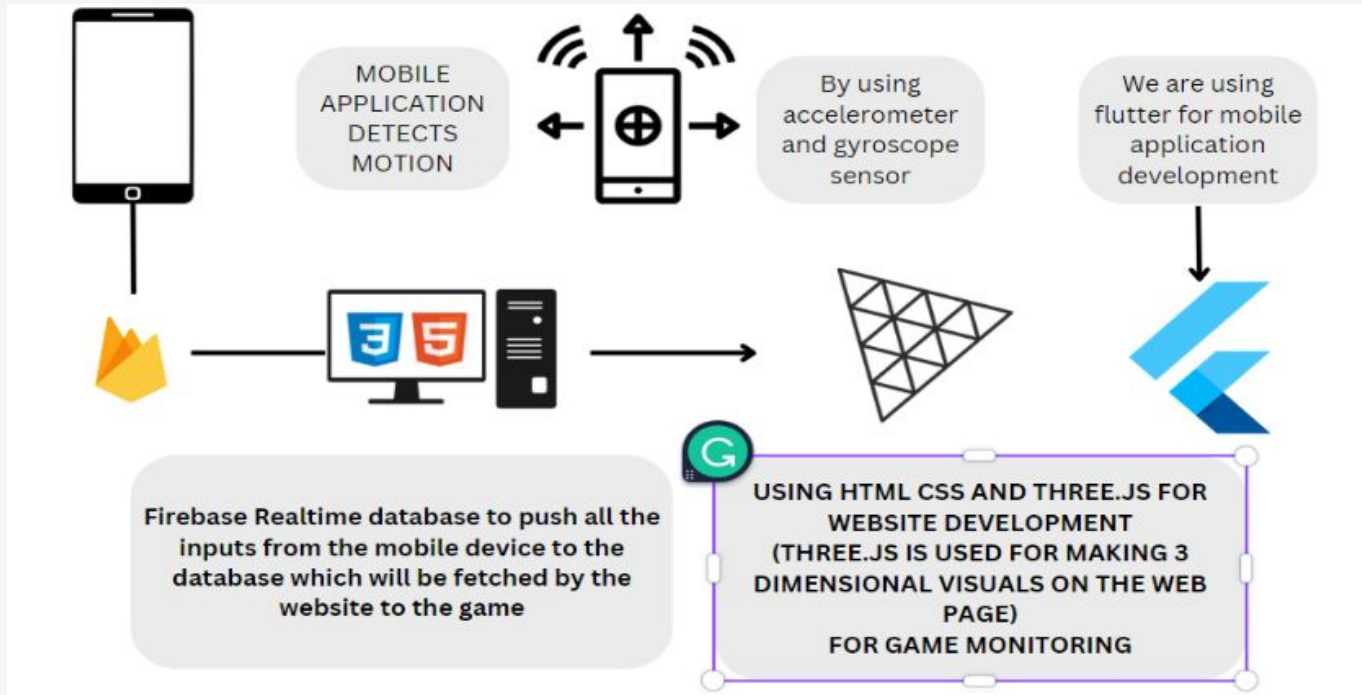Jaypee Institute of Information Technology

MOTIVATION BEHIND THE PROJECT

- We all are stuck with our computers and mobile phones and it's hard for people to exercise or workout. Staying physically healthy is the most important thing.
- On top of this, people's working in IT firms or any other firms who have a busy schedule and they never actually work out. Staying healthy and fit shouldn't be this hard.
- So we are making your mobile device and computer systems a source of fitness, so that instead of hindering you from going out to physically work out they actually helps you to work out.
- We are trying to deliver it as a source of entertainment, so that people don't get bored while accessing this application. We are going to deliver it by making a 3D animation game.

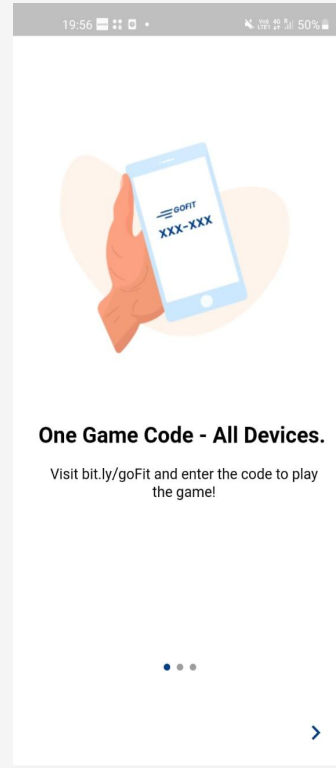# Technologies

SENSORS PACKED IN ANDROID

FIREBASE REALTIME DATABASE

HTML CSS THREE.js

FLUTTER

For the website

For android app

to push all the inputs from the mobile device to database (accelerometer and gyroscope readings)

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Working Design

MOBILE APPLICATION DETECTS MOTION

By using accelerometer and gyroscope sensor

We are using flutter for mobile application development

Firebase Realtime database to push all the inputs from the mobile device to the database which will be fetched by the website to the game

USING HTML CSS AND THREE.JS FOR WEBSITE DEVELOPMENT
(THREE.JS IS USED FOR MAKING 3 DIMENSIONAL VISUALS ON THE WEB PAGE)
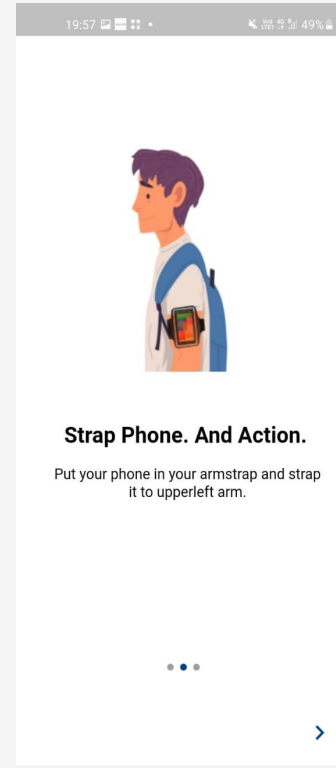FOR GAME MONITORING
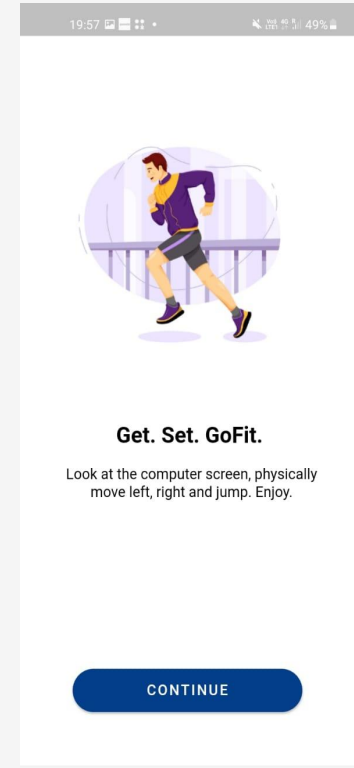
MOBILE APPLICATION

- *ONBOARDING SCREENS*

- Most of the logical work of this project is done in the mobile app.
- This application reads the accelerometer sensor value with the
- help of flutter sensor_plus package.

One Game Code - All Devices.

Visit bit.ly/goFit and enter the code to play the game!

PAGE 1

Strap Phone. And Action.

Put your phone in your armstrap and strap it to upperleft arm.

PAGE 2

Get. Set. GoFit.

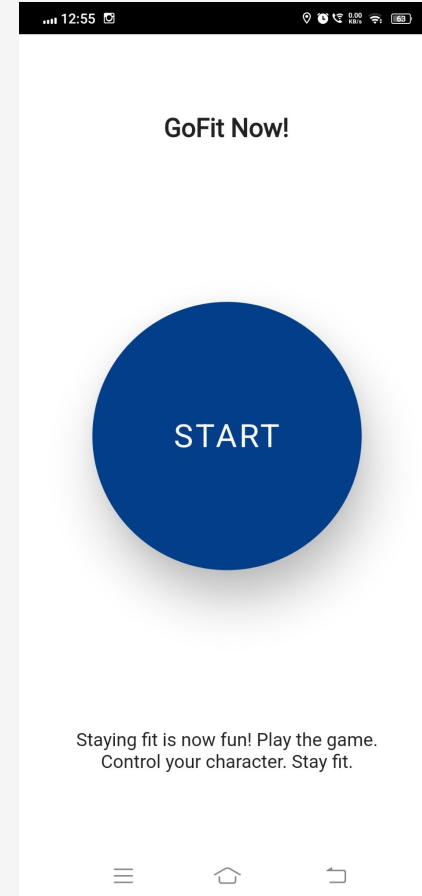Look at the computer screen, physically move left, right and jump. Enjoy.
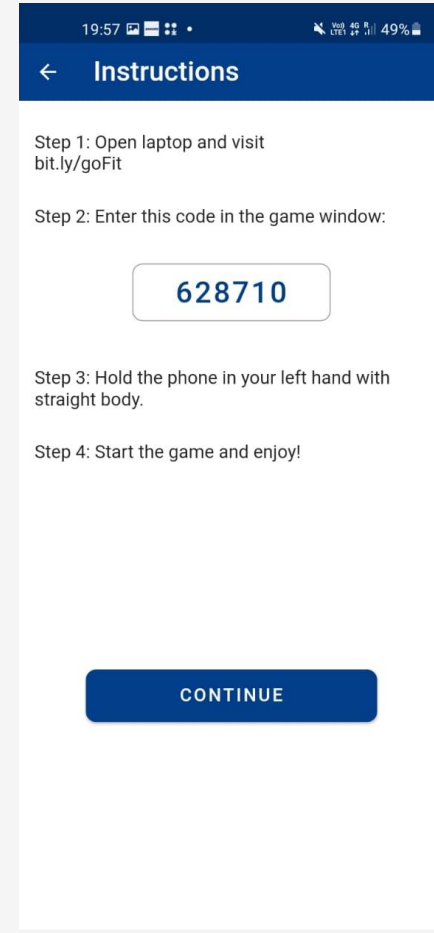
CONTINUE

PAGE 3

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START PAGE

This is the starting application page, after starting the application the user is ready to connect the mobile phone with the web page.

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INSTRUCTION PAGE

Here you get the game code and also the instructions on to use the app.

19:57   Instructions

Step 1: Open laptop and visit bit.ly/goFit

Step 2: Enter this code in the game window:

628710

Step 3: Hold the phone in your left hand with straight body.

Step 4: Start the game and enjoy!

CONTINUE

START PAGE

This is the starting application page, after starting the application the user is ready to connect the mobile phone with the web page.
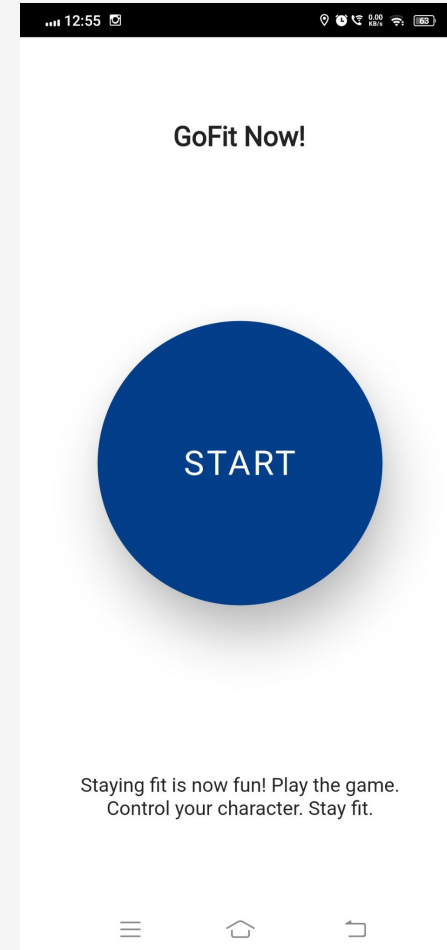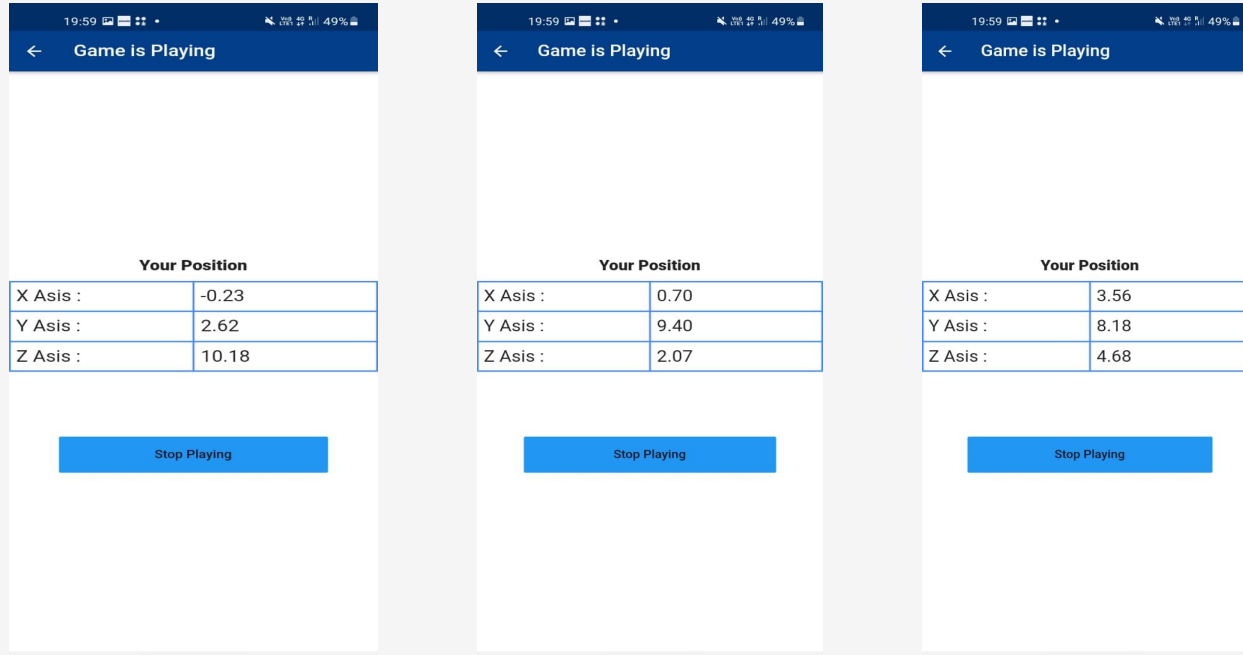
POSITION TRACKING BY ACCELEROMETER (INTERNAL HARDWARE)
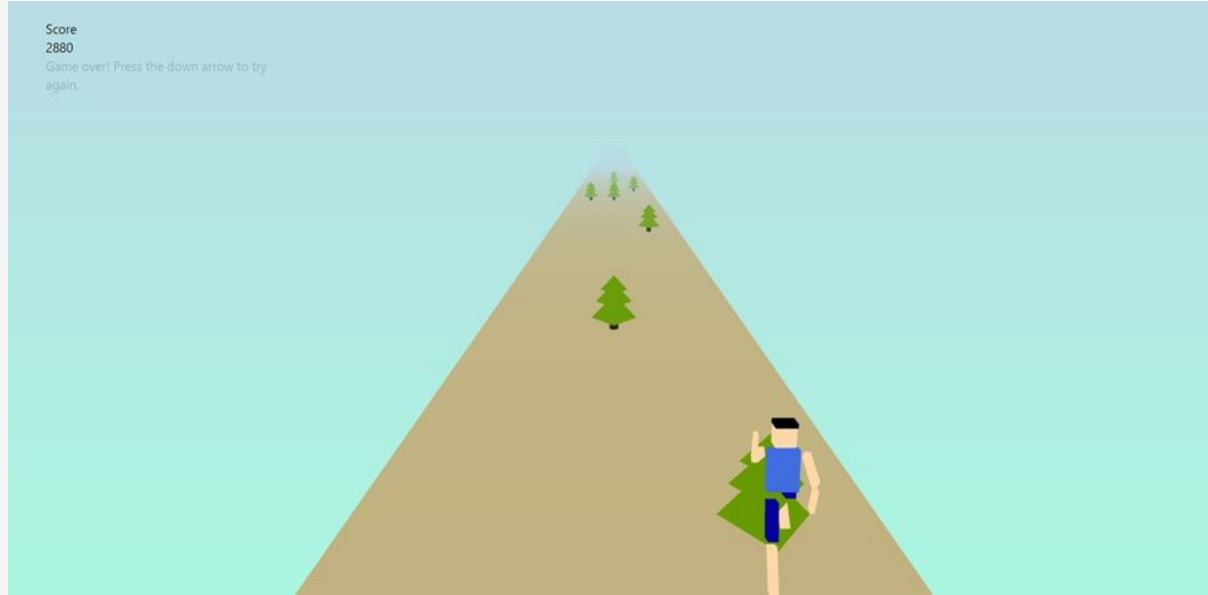

This is the ultimate page of our mobile application, which tracks your position in 3 dimensional axis and keeps on pushing your values in the database, if there is a sudden change in the values your character will jump,move sideways according to these readings.

Landing Page

Score
2880
Game over! Press the down arrow to try again.

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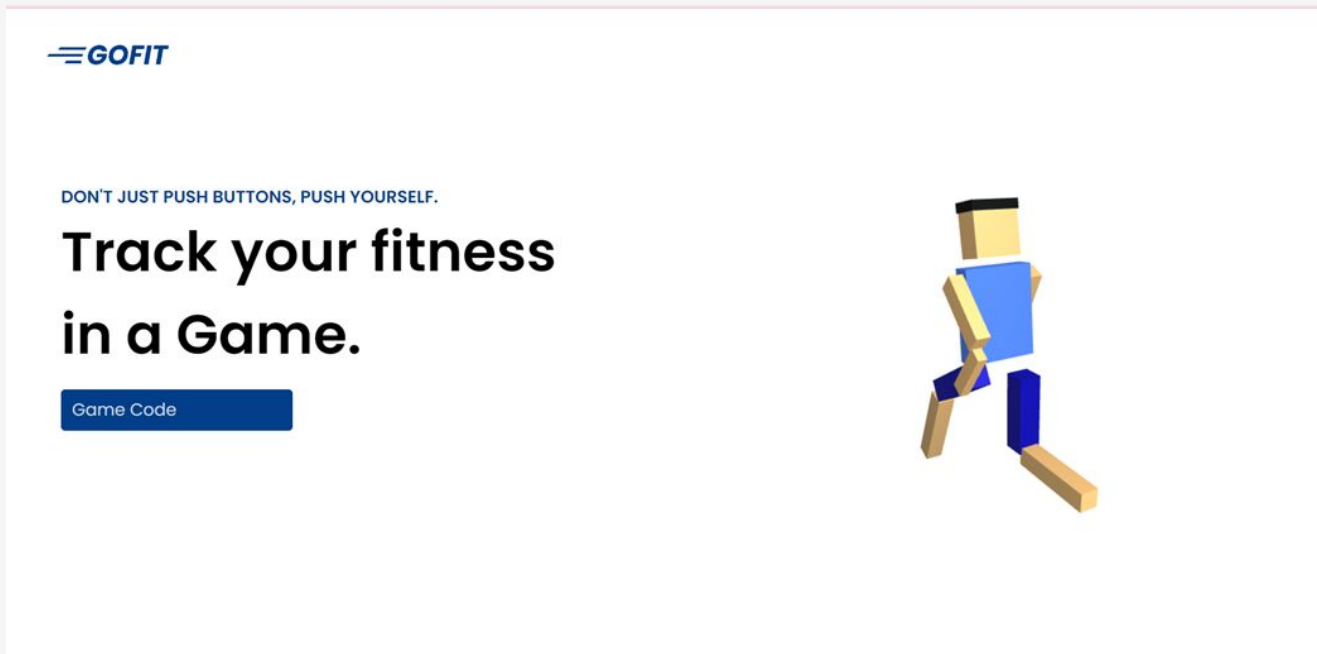
HOW IT WORKS

- Our app and website are both connected through firebase realtime databases which reflects the required change based on our movement (i.e LEFT=1, RIGHT=2, and JUMP=0).

- This sensor value gives us the acceleration about all the three axis i.e x-axis, y-axis and z-axis.

- We have created our own algorithm which will help the avatar to take an action(LEFT, RIGHT and TOP) when the any axis accelerometer sensor satisfies the following condition.

CODE

```
void initState() {
  // TODO: implement initState
  super.initState();
  accelerometerEvents.listen((AccelerometerEvent event) {
    setState(() {
      x = event.x;
      y = event.y;
      z = event.z;
    });
  });
```

```dart
47      }
48
49      @override
50      Widget build(BuildContext context) {
51        sixth = fifth;
52        fifth = fourth;
53        fourth = third;
54        third = second;
55        second = last;
56        last = z;
57
58        //Jump
59        if (y > 15) {
60          print("Jumped");
61          realtimeUpdateAction(0);
62        }
63        //Left
64        if (third < 0) {
65          if (last > (sixth * 2)) {
66            print("left");
67            realtimeUpdateAction(1);
68          }
69        }
70        //Right
71        if (fifth > (sixth * 1.3)) {
72          if (fourth < 0.5 || third < 0.5 || second < 0.5 || last < 0.5) {
73            print("right");
74            realtimeUpdateAction(2);
75          }
76        }
77
78        return Scaffold(
79          appBar: AppBar(
80            title: Text("Flutter Sensor Library"),
81          ),
```

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OUR ALGORITHM

```
sixth = fifth;
fifth = fourth;
fourth = third;
third = second;
second = last;
last = z;
//Jump
        if (y > 15) {
        print("Jumped");
        realtimeUpdateAction(0);
        }
        //Left
        if (third < 0) {
        if (last > (sixth * 2)) {
        print("left");
        realtimeUpdateAction(1);
        }
        }
//Right
        if (fifth > (sixth * 1.3)) {
        if (fourth < 0.5 || third < 0.5 || second < 0.5 || last < 0.5) {
        print("right");
        realtimeUpdateAction(2);
```

Motion Sensors

- Most Android-powered devices have an accelerometer, and many now include a gyroscope; these hardware-based sensors can derive their data.

- Motion sensors are useful for monitoring device movement, such as tilt, shake, rotation, or swing. The movement is usually a reflection of direct user input , but it can also be a reflection of the physical environment in which the device is sitting.

- All of the motion sensors return multi-dimensional arrays of sensor values for each SensorEvent.

- For example, during a single sensor event the accelerometer returns acceleration force data for the three coordinate axes, and the gyroscope returns rate of rotation data for the three coordinate axes. These data values are returned in a float array (values) along with other SensorEvent parameters

Mobile Setup

➢ You strap your phone on your arm or hold it in your hands.

➢ Stand in front of your laptop with the website open

➢ A game starts playing on the laptop where your character is running and obstacles are coming from the front.

➢ You have to actually jump, turn left and right to control your character which will be detected by the motion sensors.