Introduction: *Get Your Back Back* Project Introduction by Thehan

Welcome, we are Cambourne Electronics and Robotics Club (CERC). We will be presenting our project *"Get Your Back Back."* This project focuses on improving the posture of people sitting too long. In this presentation, we will talk about previous project ideas, Survey on how much exercise people do, research on the effects of having a good posture, and the proposed solutions using Machine learning technology

Research: Google Form Research by Pranaav:

We sent out a google form (survey) based on Physical Activity
The questions were like types of exercises, the amount of time it takes them to do exercise and obstacles they face for doing exercise.
Based on survey response Team Found Time is main constraint for not moving much.
As everyone knows benefits HIIT exercise, but team wanted to deal with root problem. So here is what we have been doing so far:

Coupons 4 Calories and 3D Game by Vivek:

One of our projects was called Coupons 4 Calories which measures your heart rate using a Bluetooth heart rate monitor. Our idea to motivate people to exercise was to let them have coupons for healthy food and in return, they would burn their calories.

Heart rate monitors has number of benefits as it measures exercise for people with different abilities and this in turn can benefit to reduce NHS's long term cost as the heart rate variability can detect disease at an early stage

We also worked on 3D game comparing a healthy and unhealthy village using Roblox.

The Other Two projects we have done by Anvi

Another project we considered was the mini:mu music project. The mini:mu is a fingerless glove you stich yourself, including two pouches for a micro:bit and it's battery pack. The main idea is when you tilt your hand, the micro:bit will detect it and play some music, but it is encouraged to use different ideas too. Our project idea was to connect a mini:mu to a computer, and when you tilt your hand in a certain way, the music will play, pause, become louder, quieter, that sort. This would encourage more movement, rewarded with music, especially in care homes for elderly people, who don't exercise so much as they don't feel they are able to. However, we couldn't go through with this idea because we had trouble connecting it to the music software on the computer. We're thinking of looking further into this idea, however. We also researched the Desk Cycle idea.

Benefits of Good Posture by Sreenidhi

My name is Sreenidhi and I will be explaining the benefits of our final solution and why the team thought good posture is the correct solution to our problem. Based on the feedback from our research, we realized that time was the main constraint for being active and therefore we selected good posture as the project to work on. Our muscles go into fatigue due to repetitive strain. Lactic acid builds up in the muscles making them prone to pain and injury. Taking micro breaks helps in body movement. Our solution helps to bring constant

posture awareness and alerts the user about the postures, which could then encourage users to take more breaks, stretch and move around.

Having a good posture is important because:

- It can help our muscles and joints by keeping them in the correct alignment.
- Breathing becomes easier and deeper because it allows our ribs to expand more easily.
- It promotes a healthy neck and spine by keeping the intricate structures in the neck and spine fit.
- It improves circulation and digestion because it allows the organs to assume their natural position and function.
- Our muscles go into fatigue due to repetitive strain. Lactic acid builds up in the muscles making them prone to pain and injury. Taking mini breaks helps to body movement.
- It also gives a positive mind-set. When we are happy our posture is usually upright whereas when we are unhappy our posture tends to slouch.

Final solution: Teachable machine by Aaron

We decided to use the computer's built-in camera and a tool called Google teachable-machine for our posture project, which uses Machine Learning to analyse various postures to let people know how they're doing.

This tool processes data using a training set from the cloud to come to a conclusion about the data that is given. With this app, you don't need to buy anything extra as we only use the camera on the device obviously with user permission. To train the machine for our needs, we gave the machine two groups, good and bad postures, and then filled them with pictures of people sitting in both ways. The computer analyzed this and can now give a percentage of good and bad posture values. Other apps such as Kemtai, YogaAi, and Zenia exist using the same technique, however, they are used while doing yoga or exercise.

How app works by Ted

What it does is check your eye alignment, and where they are in comparison to the computer. It also checks your shoulder-line to see if you are slouching. This uses the built-in camera on your PC or laptop. It then compares your image to a set of good and bad examples, determining if you have a good or bad posture. Then we could notify user with Green, Orange and Red Traffic light notification based on the posture.

Conclusion by Maya

We could also extend this app to monitor other health parameters like how long they are sitting, move moment of eyes, stress management, distance of monitor to eye and position of body to computer. There are some apps in market to help improve posture but none of them use the same concept of AI to correct the posture with no extra cost. Our project would benefit the most office worker in front of computers for long periods of time. Most of them are prone to get bad posture and back pain which could affect their daily life then end up not doing any exercise for the day.

Hope our solution helps to bring constant posture awareness and alerts the user about the postures, which could then encourage users to take more breaks, stretch and move around

Demo of Teachable machine