



Get your Back Back

Before this Idea

Team CERC were researching project ideas on how to motivate inactive people with all abilities. The team have come up with 4 projects below.

1) Using heart rate (because it is unique to individuals) monitors to measure activity and encourage them with a voucher scheme

You can view this project (80% done) with the link below:

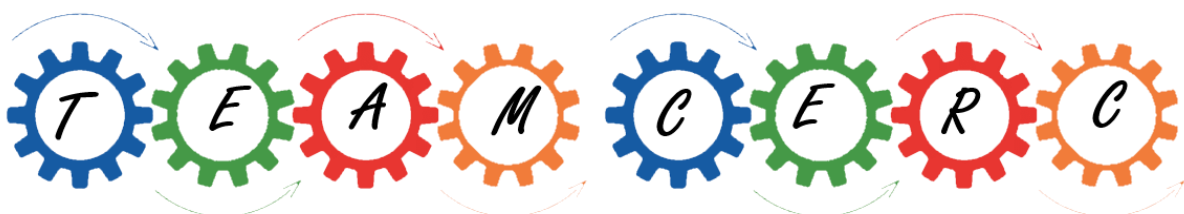
https://docs.google.com/presentation/d/1nn2BVca1-gAggM9Ch54JMn_vJPWWkZ37gZAKYitFHCM/edit?usp=sharing

2) Using the Mini Mu Electronics Kit to help/encourage people in care homes to do activities

3) By Using Roblox we could show the difference between a Healthy village compared to an Industrial Village and display them with a 3D Google Lens

4) A Desk cycle to help people who are working in offices

Tasks	Completed	People	😊
Coupons	5/10	Liam	😊
Cycle desk	0/10	Aaron, Anthony, Seanidhi	😊
Posture check	0.5/10	Mike, Aaron, Ted	😊
Mini MU	5/10	Aaron, Aaron Megan, Noah, Sarah, Seanidhi	😊





The Team wanted to do an innovative project that can be used remotely and tailored to personally using the latest technology.

Research behind this Project

Our team created a Google survey and collected the data from it.

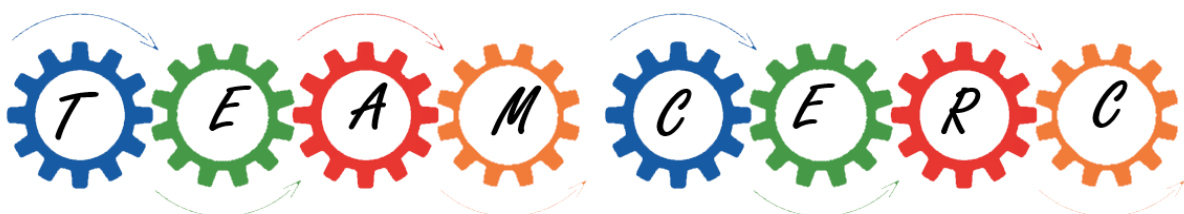
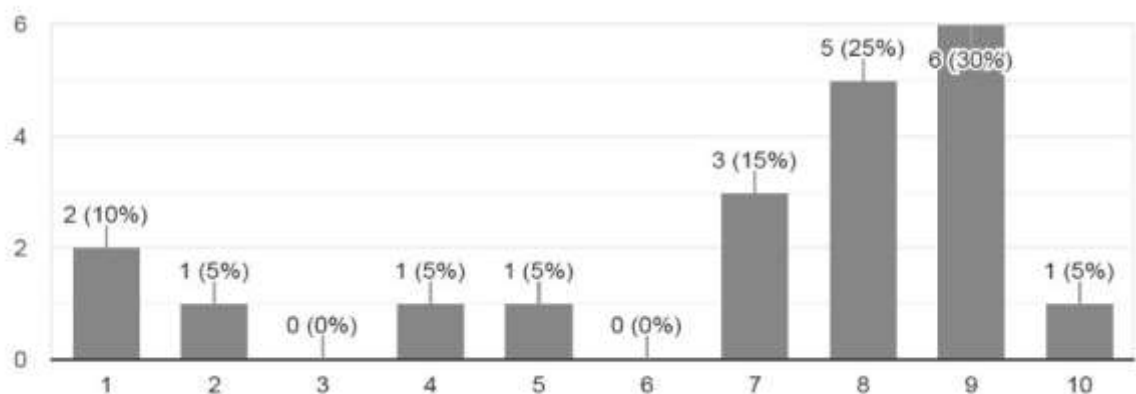
You can view the full Questionnaire with the responses as below

<https://drive.google.com/file/d/1w0a4hEzSSCUDvch97VuOgWmkLszoUoOh/view?usp=sharing>

Below there are two questions to address the main cause of the problem

If there was a financial benefit or coupons for amount of time you spent for exercise, would you like to do more exercise?

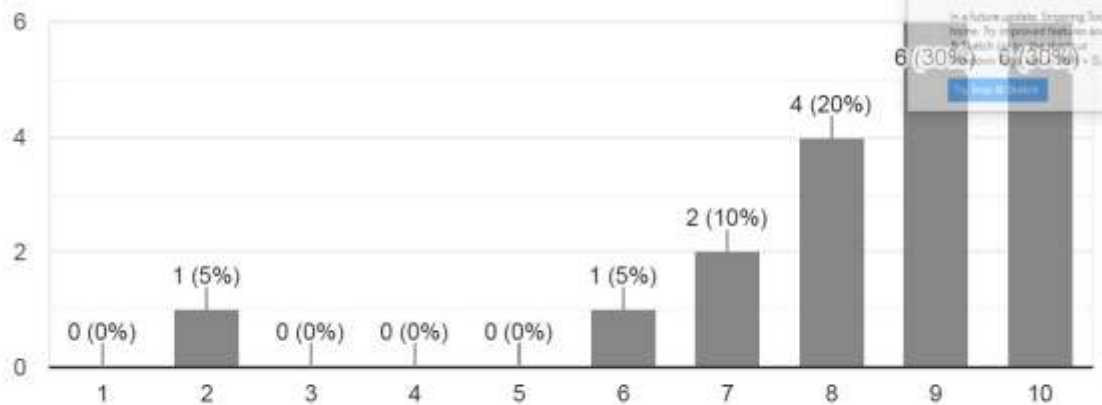
20 responses





Provided if you have time for exercise, Would you do more exercise?

20 responses



The team researched the topic and they could **not** find any AI computer solutions that addressed the problem of sitting too long in front of a computer.

There is total screen time and internet time on some operating systems like windows and Mac but that is the total time the computer is turned on.

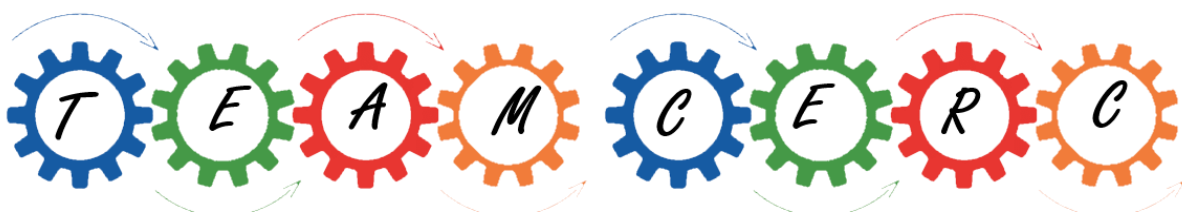
The team wanted to explore and taking mini breaks from sitting in front of computer after finding the advantages of HIIT exercises at regular intervals.

Overview

While researching about solutions **we realized that time is the main constraint**, we also came across Virtual Personal Trainers using AI Technologies like [Kemtai](#) and [YogAI: TensorFlow powered yoga instructor](#) –

We thought this technology is useful under lockdown when all gyms are closed, all fitness videos are helpful if you can go with the pace of video whereas this AI personal trainer will help to achieve your goals at your own pace.

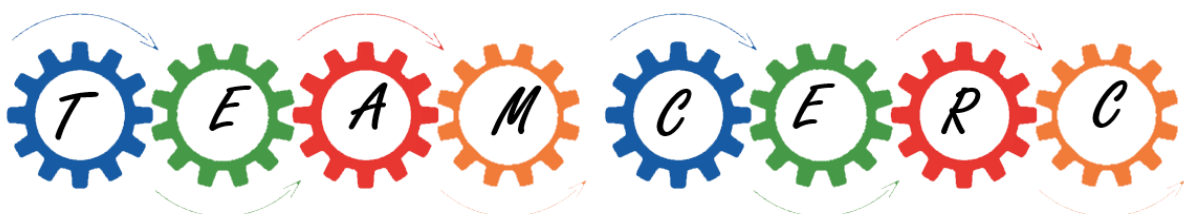
With limited knowledge of AI Team tried to learn different AI platforms available we came across Google AI platform [Teachable Machine](#) which is easy to train AI models and use it with your application.





The team thought having a good posture and taking mini breaks to move from sitting the whole day is fundamental or easier to achieve for most of office workers than motivate them to do exercises.

Here is a link to a mini play that we did: <https://youtu.be/B8RbmypnSAQ>



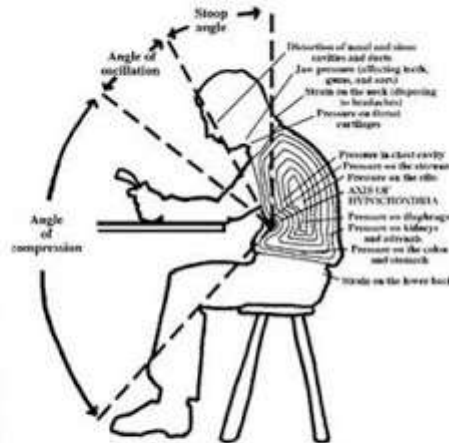


EFFECTS OF POOR SITTING POSTURE

- Inhibits blood flow to and from the heart
- Stifles breathing and diaphragm function
- Shortens muscles in front of body
- Stresses the lower back
- Hyperextends back muscles
- Closes off throat and windpipe
- Constricts the voice
- Habituates bending forward
- Adds pressure to kidneys, adrenals, colon and stomach
- Inhibits cerebrospinal fluid flow
- Inhibits learning
- Invites osteoporosis
- Impedes nerve force from the spine
- Restricts solar plexus (abdominal brain)
- May negatively impact sleep



Poor Sitting Posture



The Posture Theory Diagram

Get posture and activity sensor and improve your posture compatible with Apple iPhone 5S, 5C, 5, 4S, iPad (3rd and 4th gen), iPad Mini, iPod touch and Lift Clips for affordable price by using [LUMObac Coupons](#)



Teachable Machine is a web-based tool that makes creating machine learning models fast, easy, and accessible to everyone.

How do I use it?

Class 1

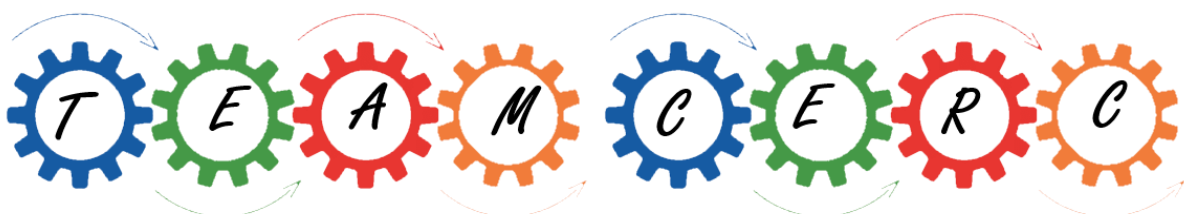
Class 2

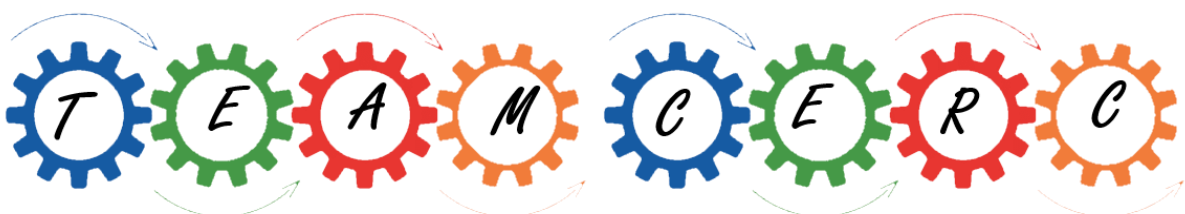
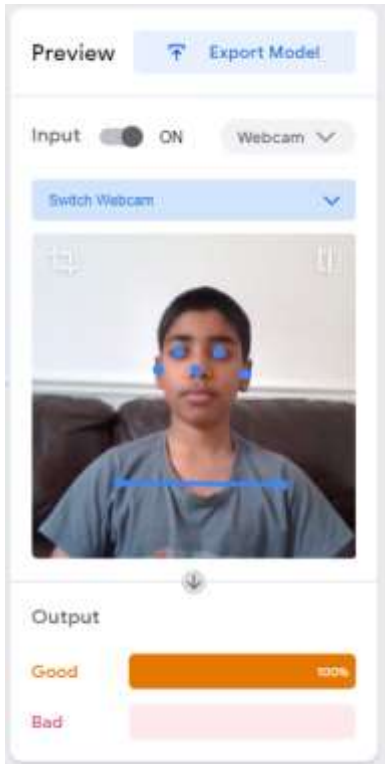
TRAIN MODEL

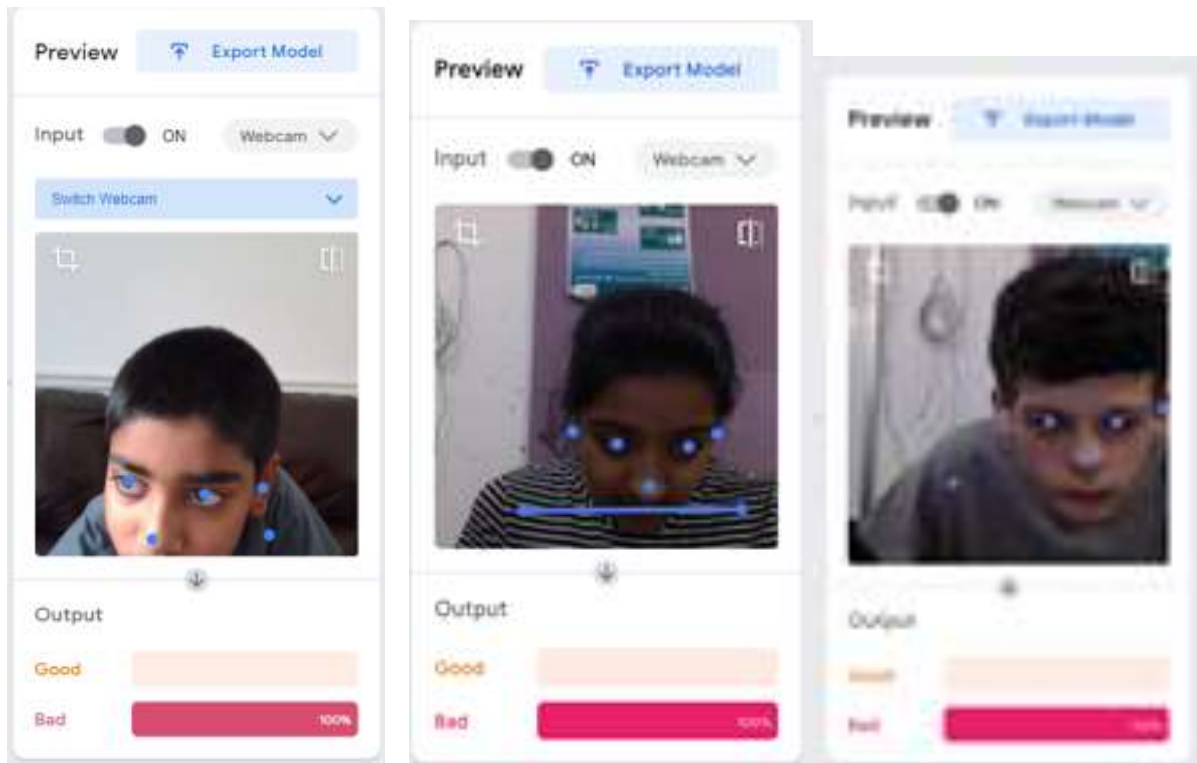
*** MYPROJECT ***

- Gather**
Gather and group your examples into classes, or categories, that you want the computer to learn.
[Video: Gather examples](#)
- Train**
Train your model, then instantly test it out to see whether it can correctly classify new examples.
[Video: Train your model](#)
- Export**
Export your model for your projects, sites, apps, and more. You can download your model or host it online for free.
[Video: Export your model](#)

The team trained the model with each kid and parent taking poses at each Lego session. Then we used the model to detect if the person is sitting correct in front of computer or not.







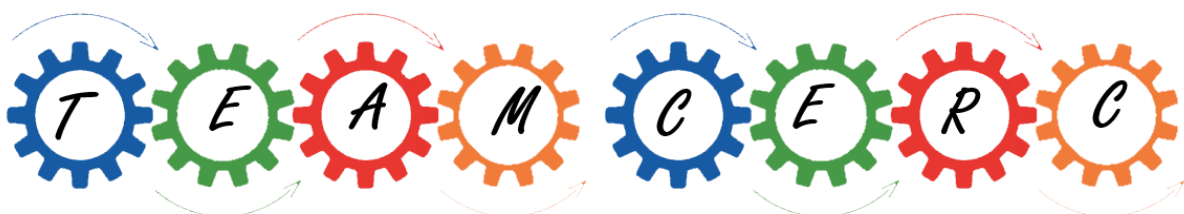
We are planning to implement this app as a background windows service like an Antivirus so it is always checking the **Persons sitting pose** and **how long they are sitting, how long they are watching** the computer.

Then give a *Green, Orange, Red* notification warning to take a break to get active.

Benefits of having a good posture

Firstly, having a good posture can help our muscles and joints by keeping them in the correct alignment so that our muscles are used correctly. A good posture will allow all muscles to work more efficiently, this will allow the body to use less energy, therefore, preventing muscle fatigue. It also helps prevent muscle strain, overuse disorders and even back pain and muscular pain.

Secondly, having a better posture benefits you because breathing becomes easier and deeper. When we slouch, our ribcage can sink down towards our abdomen which can cause a restriction to deep breathing. This can assist with improved



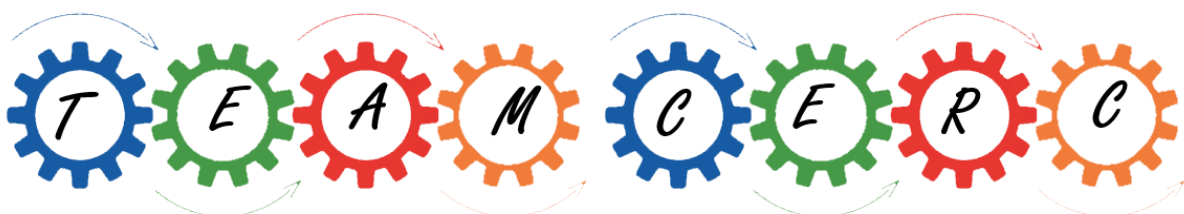


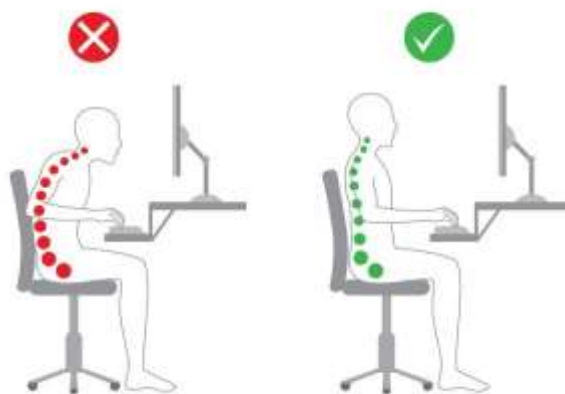
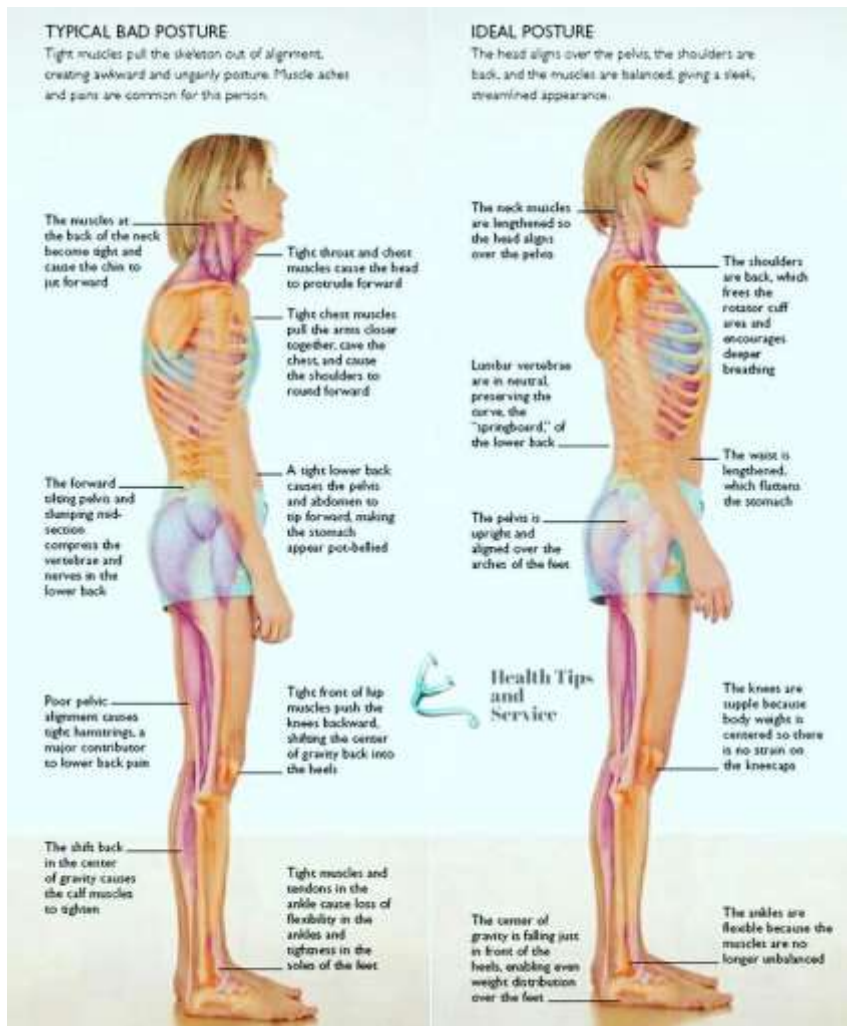
relaxation and concentration as we move through the day. Good posture allows our ribs to expand more easily.

As a result of good posture, it improves circulation, heart rate control and digestion. Good, upright posture allows the organs to assume their natural position and function, whereas poor posture can cause undue compression of the internal organs in the abdomen.

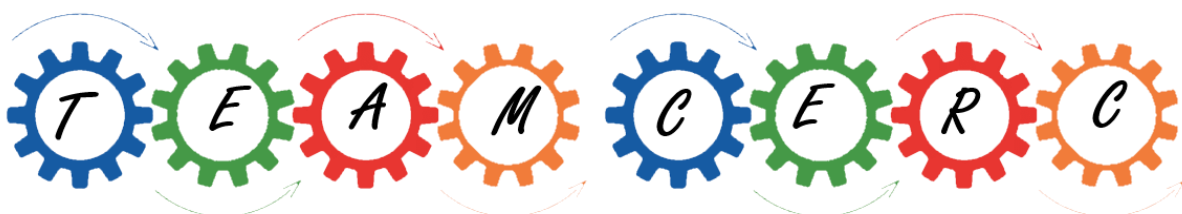
Additionally, good posture promotes a healthy neck and spine. Having a correct posture is a simple but very important way to keep the intricate structures in the neck and spine healthy. This is especially important for people who spend many hours sitting in an office chair or standing throughout the day. Poor posture and inadequate back support can add stress and strain to the muscles and joints of the spine. Over time, there can be shortening of the ligaments and muscles of the spine with the possibility of ongoing pain, stiffness, and discomfort.

Lastly, proper posture gives us a positive mind-set. Posture affects our frame of mind, and our frame of mind can affect our posture. So, when we are well and happy, our posture tends to be upright and open. In contrast, when we feel down or in pain, we often sit or stand slouched.





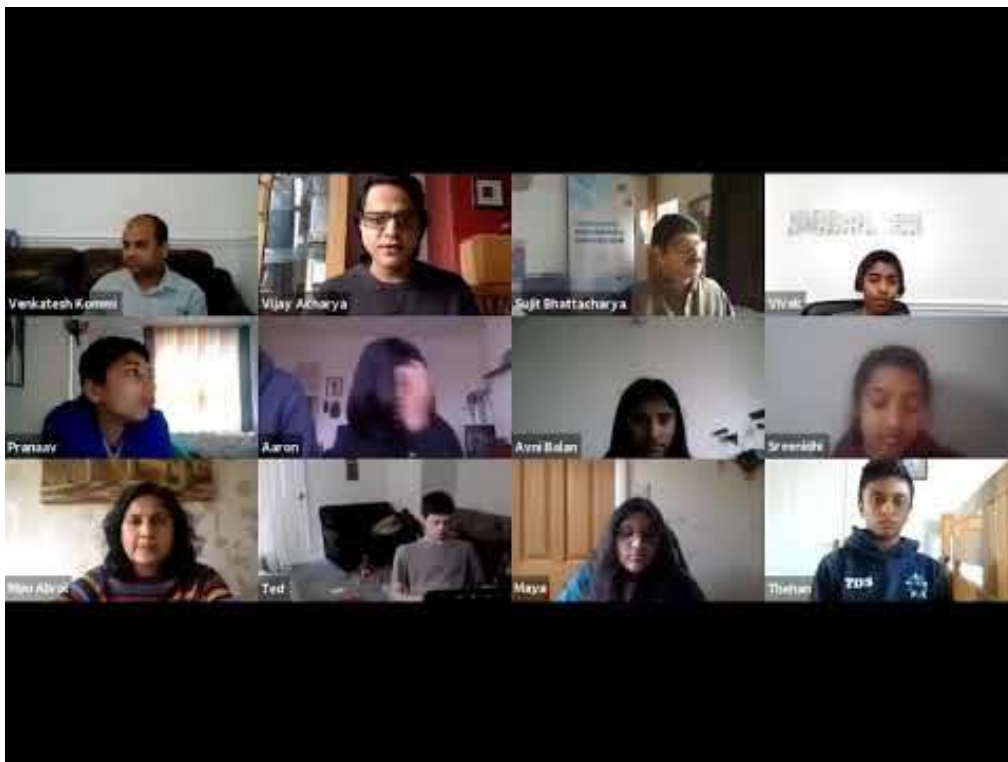
What do experts think about this project and what is their input





The team has presented our idea to Apurva who is a senior Physiotherapist at Progress. She has been working at Spire Cambridge Lea Hospital since 2005. Apurva's special interests include shoulders, necks, workstation assessment, ergonomics and posture re-education. She has also completed Pilates training.

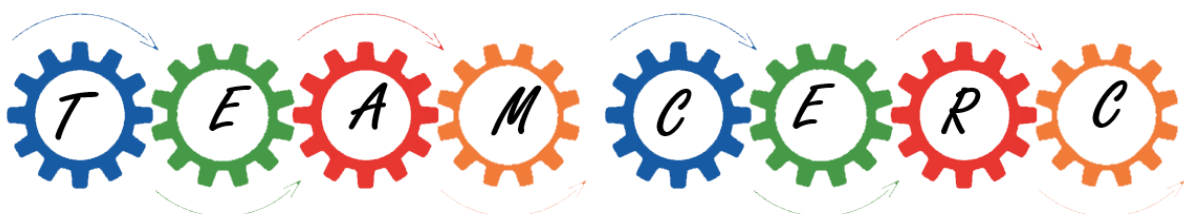
Apurva also offers treatment with Acupuncture, taping and strapping. Apurva is a very keen badminton player which gives her a good know how on racket related sporting injuries to help tailor rehabilitation goals.



(Click above picture to see Apurva's feedback)

<https://drive.google.com/file/d/1FGKnrRlkO9gcF-NBTIT3i3oXFyWm-qmp/view?usp=sharing>

(Click above link to see full video presentation)





Also we presented our project idea to Scientists from Institute of Metabolic Science, Cambridge University.

<https://www.ims.cam.ac.uk/>

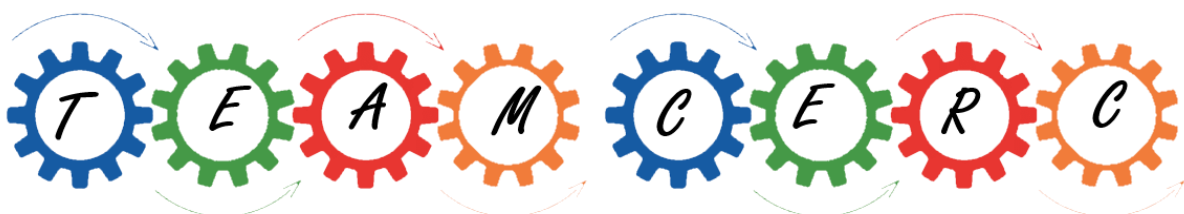
Attached link to their feedback below

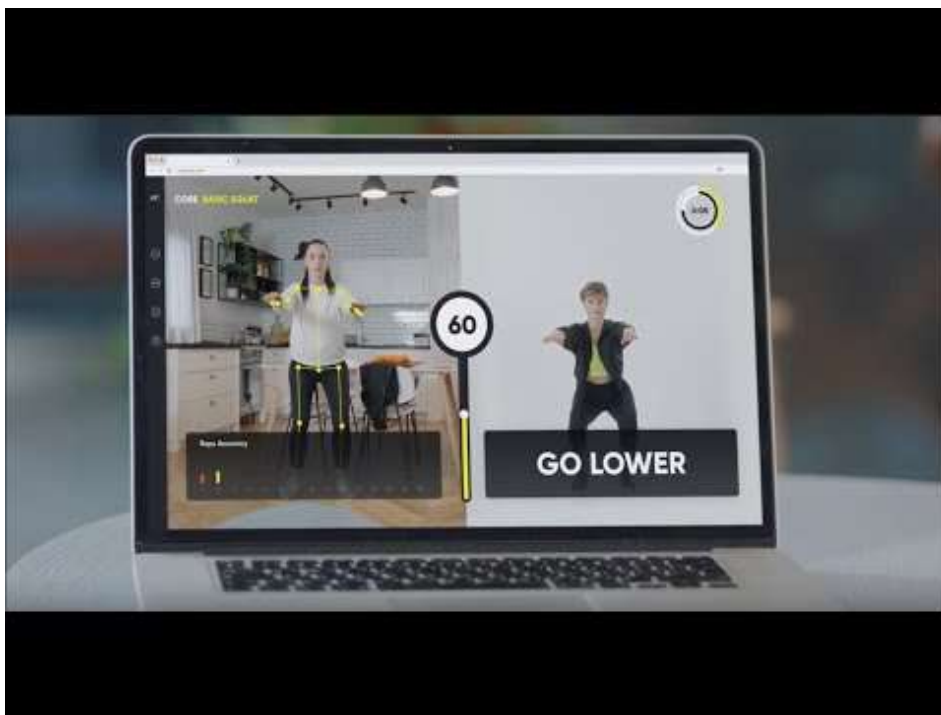
https://drive.google.com/file/d/1yV_KC-Qgna9Ushft5BKpu7p8citm5GpQ/view?usp=sharing

References

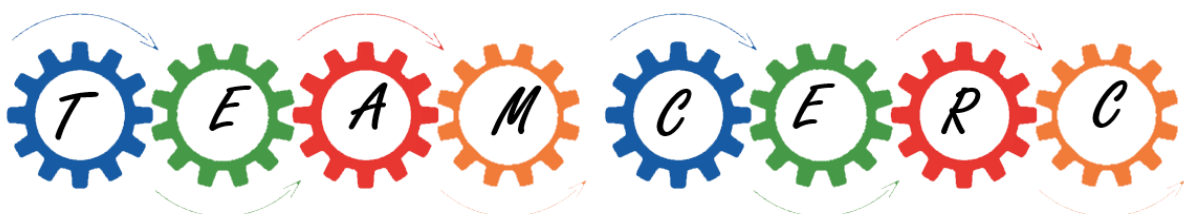
<https://app.kemtai.com/welcome>

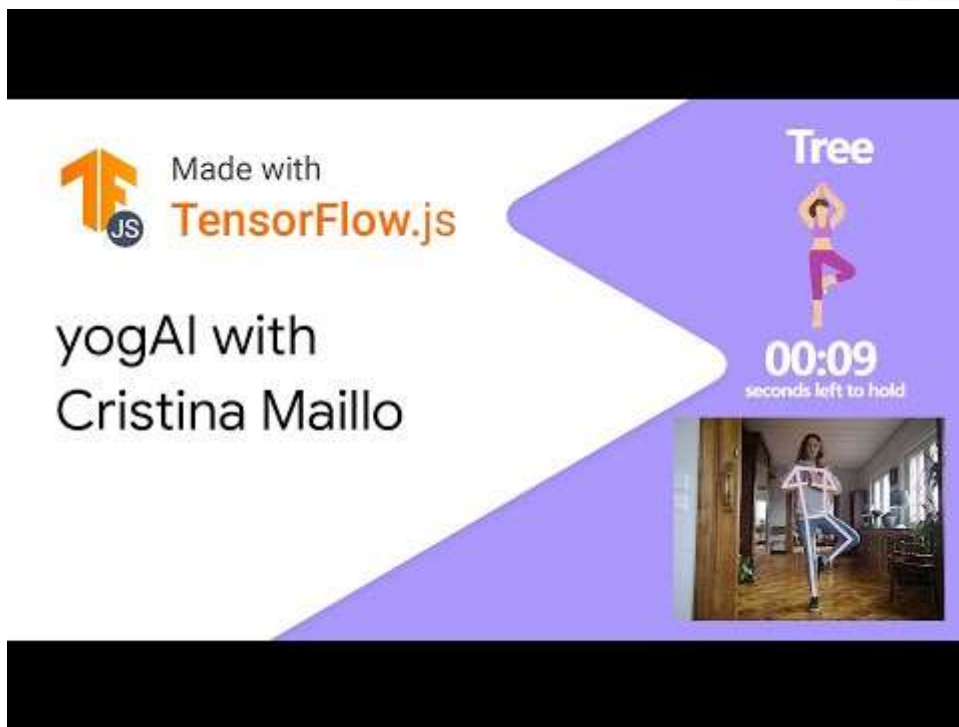
<https://teachablemachine.withgoogle.com/>





[\(21\) Kentai - Your Personalized Home Fitness Experience - YouTube](#)





[\(21\) YogAI: TensorFlow powered yoga instructor - Made with TensorFlow.js - YouTube](#)

[\(21\) AIDEN physio assistant by Shivay Lamba - Made with TensorFlow.js - YouTube](#)

[Why good posture matters - Harvard Health](#)

[The Many Benefits Of Good Posture - Elevate Fitness \(elevatesyracuse.com\)](#)

