

A System and Method to Capture Body Movements And Analyse The Activity Or Exercise Of Associated Body Muscle Or Group Of Muscles And Recommends Body Muscles Which Needed Medical Attention

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1. Background: What is the problem solved by your invention?

I. Problem Solved :

Our body made of flesh and bones and we need to follow some exercise to keep it healthy and strong. To keep our body healthy food is important at the same time some exercise also has a great role and we practice various exercise according to our health condition prescribed by Doctors. But Now a days in our busy schedule we can't get the chance to visit doctors for regular check up, so most of the time we visit Doctors after we experience some health issue(Exception: Who do regular health Check up).

So, to solve this problem we came up with an new idea. We thought, can we not design a system which will always observe our exercise pattern or pattern of body movement and take care of our health issue by notifying us prior to the occurrence of the health issue. Our idea is to design a system which will record our day to day exercise pattern or pattern of body movements and analyze the sufficiency of the exercise of each group of muscles and notify us with the alert about any decline in healthiness of any specific group of muscles in near future.

Our system records synchronized Body Movements (Using eTextile) of a person and then convert it to image frames and persist it to some DataBase. Then the stored image is compared with stored exercise pattern and related image frames to get the exercise which he is practising. The system then find out the exercised muscles/group of muscles by looking into repository where specific exercise or movement of body part to associated muscle mapping has been stored. Every time a muscle or group of muscle getting exercised, it is recorded. This way we build a heat map for the muscles/group of muscles' exercise frequency and then if the frequency value for exercised muscles/group of muscles go below a certain threshold value system immediately alerts the user and recommend exercise.

II. Related Work/Prior Art: Please List And Briefly Describe The Products, Publications, Patents, And Other Works That Are Most Closely Related To Your Invention. If Any Of These Works Solve Or Address The Same Problem, What Are The Drawbacks Of The Known Solution(S)?

[Ref 1] <https://en.wikipedia.org/wiki/E-textiles>

[Ref 2] <http://www.healthline.com/human-body-maps/arm-muscles/male>

[Ref 3] <https://www.freetrainers.com/exercise/musclegroup/abs/> -- Map of Exercise position to muscle impacted.

[Ref 4] http://www.intechopen.com/books/international_journal_of_advanced_robotic_systems/human-posture-recognition-based-on-images-captured-by-the-kinect-sensor

[Ref 5] <https://www.muscleandstrength.com/exercises>

[Ref 6] Patent US20080170123:

US 20080170123 A1 : Tracking a range of body movement based on 3d captured image streams of a user

US 7840031 B2 : Tracking a range of body movement based on 3D captured image streams of a user

None of the above prior art, either solely or cumulatively describes any of the below claims of this disclosure :

CLAIM:

1. System that can capture body movements and map to group of muscles that get exercised as a result of that body movement.

2. System that will store the heat map (frequency or number of times) of all the body muscles/group of muscles getting exercised as a result of claim 1 above at any particular time period e.g. daily or weekly.
3. System will check whether the exercised pattern (number of time) of muscles/group of muscles getting exercised of the person for every previous week (which is configurable) as found from claim 1 and claim 2 above, goes below a threshold value.
4. System will notify the user with proper alert to seek medical attention for particular muscle or group of muscles or body part if it is found that a group of body muscle is getting week or unhealthy as per claim 4 above.

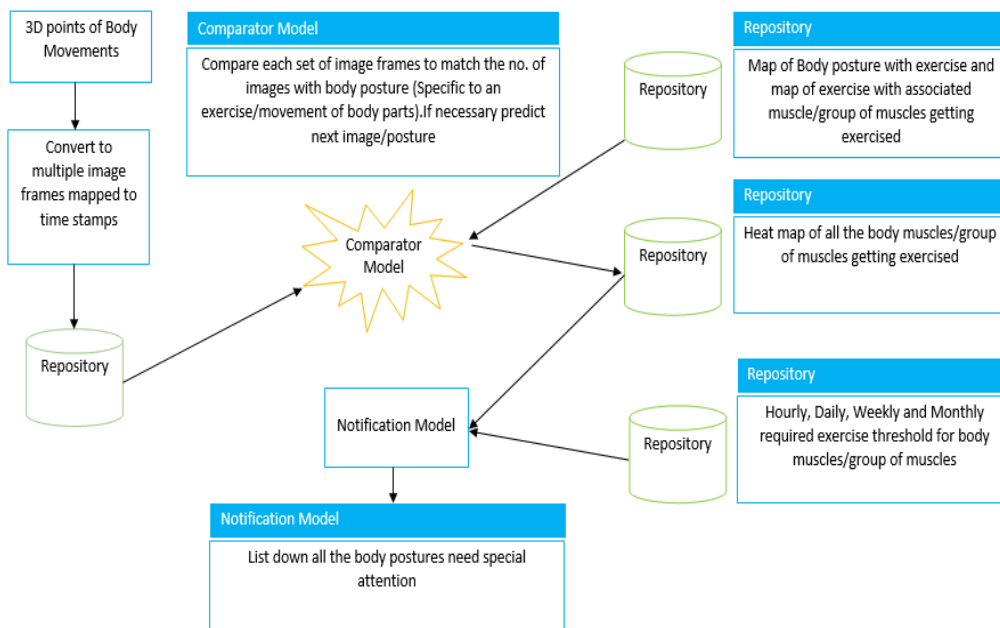
III. Summary Of Invention: Briefly Describe The Core Idea Of Your Invention (Saving The Details For Question #3 Below). Describe The Advantage(S) Of Using Your Invention Instead Of The Known Solutions Described Above.

A System and method to capture and analyze body movements and map the associated body muscle or group of muscles and identify body muscles which needed special attention

IV. Description: Describe How Your Invention Works, And How It Could Be Implemented, Using Text, Diagrams And Flow Charts As Appropriate.

The steps to implement the invention:

- 1) System or method will capture synchronized Body Movements (Using eTextile)[Ref 1] of a person .
- 2) System or method will convert the the data points into image frames and persist to a repository system.
- 3) System or method to priory store map of time synchronized body posture (ideally in the form of image) [Ref 5]with specific defined exercise name and map of exercise with associated muscle/group of muscles [Ref 3] that gets exercise.
- 4) System or method will compare each set of image frames (found in step 2) with image frames (found in step 3) to match the no. of images with body posture (Specific to an exercise/movement of body parts[Ref 4]) and if necessary predict next image/posture[Ref 6]. This will also consider the time synchronization or chronological order of the contiguous images. Based on a pre defined threshold of total number of images, "found in step 2" that got match with those " found in step 3 ", system will increase and record the count of specific exercise done, timing, frequency and the exercised group of muscles.
- 5) System or method will store the heat map of all the body muscles/group of muscles getting exercised.
- 6) System or method will check whether the exercised pattern of muscles/group of muscles getting exercised of the person for every previous week (which is configurable) goes below a threshold value[Ref 2]. If so then the system will notify the user with proper alert to seek medical attention for particular muscle or group of muscles or body part.



Exercise muscle mapping sample:

Ab Roller Crunch



Ball Trunk Twist



E-Textile:

