SE 216 – SOFTWARE PROJECT MANAGEMENT
Spring 2023-2024
Project Proposal

Section 1 / Group-8

True Posture

Problem Definition

Sport has a vital role in human life. It is effective in keeping people physically and mentally healthy. Many people join gyms and exercise to stay healthy. Despite this, by doing the movements in the wrong form, they harm their spine health. In addition, they cannot exercise the area they target sufficiently due to incorrect form, or they cannot do the movements because they do not know them exactly.

People need to work with personal trainers during the learning process, but they cannot benefit from this opportunity because they are financially insufficient or the number of trainers is low. Some of those who do it with the correct form reduce the effect of the movement or get injured by keeping the time interval too short or long. Due to these problems, the incentive for sports is decreasing. Also, objective measurements cannot be made in institutions such as the military and the Olympics.

Therefore, the aim of this project is to develop an application, which can be downloaded by people on their own phone, that maximizes the efficiency of movements while minimizing physical damage and loss of time by performing the movement in a correct posture. This algorithm will protect the health of athletes by analyzing mistakes in posture and correcting them with feedback. Additionally, more accurate results can be obtained in competitions. It will also be effective in saving the time of coaches and athletes.

Background Information

A correct form of exercise is important for people to develop their bodies properly and avoid injuries. In order to direct people to do the exercises in proper form, there are videos, and also apps, that show the exercise correctly and gyms where people have personal trainers. Also, in competitions such as military selection or Olympics, there is a judge who decides who should be selected or get a high score. However, there are some problems with these facilities.

Some people who are tracking their postures by watching videos or using apps may not know whether they are doing the exercise in the correct form or not. They also, generally, cannot be able to track the time interval of the exercise.

Personal trainer is the person who shows the correct form, repetition, and time interval of the exercise. However, many people, especially in poor countries, cannot afford personal trainers or go to the gym.

The judgement in competitions and selections should be very objective and focused in order to evaluate the people correctly. However, there are some cases where the competitors are evaluated wrongly due to misjudgement.

These situations show the need for other solutions to help people who want to do exercises in proper form.

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Objectives

Target Area or Movement Request: When users open the app, they are prompted to select the target area or specific exercise they wish to perform. Subsequently, high-quality animations prepared in advance are displayed according to their choices, enabling users to learn the correct form visually.

Movement Accuracy Feedback: The app facilitates users to monitor themselves using the camera, and employs image processing techniques to analyze the accuracy of the performed movement. It then provides detailed feedback to the user, indicating what percentage of the movement was performed correctly and offering advice on points of improvement for any inaccuracies detected.

Promote Correct Exercise Form: Ensure that the app's feedback on the exercise form is validated by a team of professional gym trainers, achieving a concurrence rate of 90% or higher between the app's feedback and the trainers' assessments. This serves as an indicator of the app's core functionality effectiveness, based on expert evaluation.

Movement Timing Accuracy: The app evaluates whether the user performs movements within the correct time frame by monitoring their actions through the camera and conducting timing analysis. Subsequently, the app provides feedback to the user, indicating whether the movement was executed within the correct timing and offering suggestions for improvement in case of timing errors.

Objective and Accurate Evaluation: The app also provides objective evaluation for the competitions that depend on whether the movement is done correctly or not. This evaluation confirms that the results are not biased.

29.02.2024

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Project GitHub Account

https://github.com/SE216-8/TruePosture

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