THE USE OF PERSONAL TRAINER SMARTPHONE APP FOR CORRECT PHYSICAL EXERCISES

Adrian IACOBINI[1]

Abstract

The personal trainer app proposes to give for free the possibility to make correct physical exercises anywhere with the help of your smartphone, in order to combat the problem of the low rate of physical movement and the high rate of obesity.

With this special app we can use the phone gyroscope and accelerometer to guide the user in order to move correctly on predetermined axes. The study can serve as a support for the future development of sports related to mobile applications and future educational programs and also to promote this application among the young generation, the ones that are most in need of pro-movement gadgets.

Keywords: *training, mobile apps, mobile phone, personal training, leisure sports*

JEL classification: *I 10, I 12, I 15*

Introduction

Obesity and the health problems deriving from this are a worldwide issue, Romania went form 8,2 obesity rate to 23,4 obesity rate in just a few years, the major factors playing this alarming raise are inadequate nutrition and sedentariness.

Smartphones are considered also the revolution of the 21st century, transforming our lives almost every day. They have become as much of an obsession for today's youth but also the best source of accessing the internet apart from the computers is the "Smartphone" (www.techiefeast.com, 2013). The purpose of this study is to highlight the importance of everyday life technology and the positive effects this can have on our health.

Thus with a simple mobile smartphone placed on the sternum of the subject we can use the phones gyroscope to calculate the axes in which the body moves, and if the subject does an incorrect movement, we know that it will move on other axes, thus the phone will emit a warning signal.

The objectives of this study:

- Reviewing the similar programs
- Establishing a beta program for a smartphone application that helps the subject make a correct squat

[1] Adrian Iacobini, School Sports Club no 4, Bucharest, adrian.iacobini@gmail.com, 0731766979

1. The research methods

Specialized literature review: The bibliographic documentation was conducted in order to spot similar apps that could help us make improvements to our idea and collect the material required for the theoretical and methodological study. „Scientific research is a process that is aiming to discover the new, starting from real existing knowledge " [EPURAN, 2005, p. 131]. Through research in the domain we found out the huge market available for this type of program, with over 2 billion smart phones soled in the last two years (Gartner, nov, 2013).

Observational techniques are "an important aspect of many action research studies and of case studies whether undertaken by participants or outsiders" [EPURAN, 2005, p. 204]. We used the observation method in order to create the "correct movement" data that would be programmed into the mobile application.

The experimental method is "essentially by the tendency towards coherence of an experience controlled relational system. ... The purpose of experimentation is to confirm the existence of a relationship between two orders of facts " [FRAISSE, 1968, p. 74; 92]. Among the experimental forms known in scientific research, in the preliminary study we use the verification experiment – used to determine if the subject does the correct or incorrect movement the smartphone will raise alert for an incorrect exercise execution.

The cybernetic method is an interdisciplinary science that deals with the laws and general and common mechanisms of organization in different systems, with self-regulation with the possibility of mathematical formalization. This method first appeared as the command science and is marked by the 1948 Norbert Winear publication "Cybernetics or the command science and communication on beings and machines" [EPURAN, 2005, p. 119]

This method was used when programming the application that will make an alert signal if the exercise is conducted outside the preprogrammed axes.

2. The experiment content

The study was conducted during 20.04.2013 – 01.10.2013, and by analyzing the smart phone app market we discovered that there are over 100.000 sport related apps only in the Google play online smart store.

We developed the application in order to be used on the android system, by using the latest version of the Java JDK x86 version, with the default options and the Android SDK 32-bit ADT-Bundle version for Windows, in order to prevent compatibility issues.

To record the correct movement we used Sensor Kinetics Pro that provides us with all of the movement data on the Roll – Pitch - Yaw plus it allowed us to apply filters to the data stream, save the raw sensor and view the data in a tabular format right on your phone.

After placing the smart phone on the chest of the subject (figure 1) we gave indications for a correct set of 3 squats (figure 2) and collected the data of the roll, pitch and yaw.

Figure 1 Chest piece

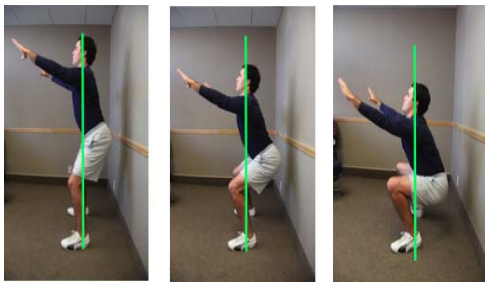


Figure 2 Squats

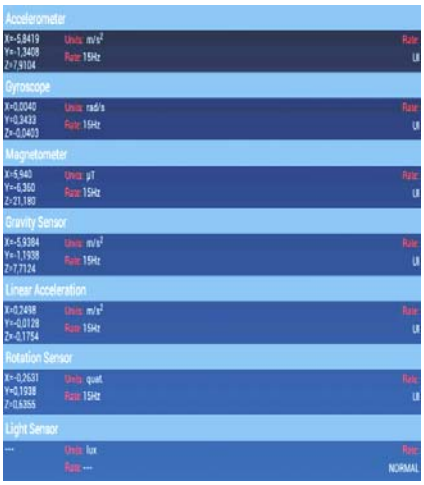


Figure 3 Correct Data

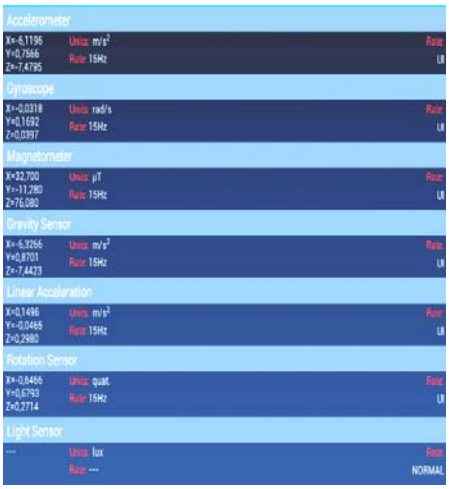
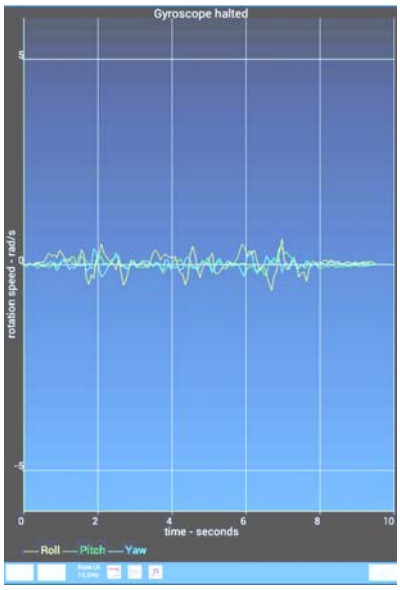


Figure 4 Incorrect Data

Figures 3,4,5,6 will show the collected data, with which we programmed the phone gyroscope to emit an audio signal whenever the subject would get out from the predetermined axes, thus alerting him if the squat is incorrect. If the subject gets out of the predetermined roll as seen in figure 6 the program will make an audio alert.



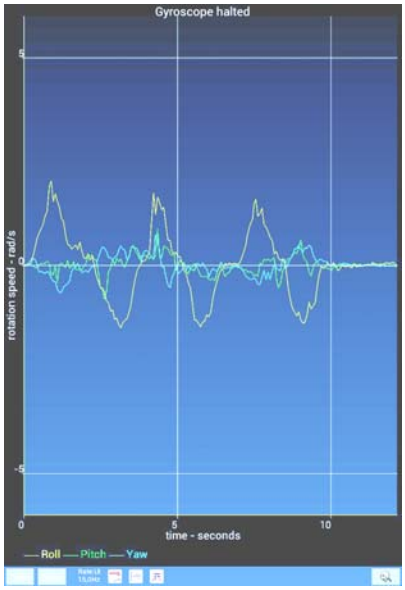


Figure 5 Correct Squat **Figure 6 Incorrect Squat**

In the experiment we placed the mobile smart phone on the chest of the subject and gave him the task to make a set of 30 squats.

In experiment one the subject made the squats, but we only recorded the data. There was no alert turned on. After the measurement we observed that from the 20th squat, the subject got out of the correct roll predetermined axes, and continued doing this incorrect exercise to the end.

In experiment two the application alert was on, every time the subject got tired and did an incorrect squat he received a sound alert and corrected his movement.

3. Conclusions

- The collected data shows the huge market available for such a mobile smartphone application, on the android market or IOS store;
- By using the phones gyroscope we can guide a correct movement of a subject that is making a certain physical exercise;
- A subject corrects itself, after the alert sound;
- By making correct physical exercises we can optimize the benefits it brings on our organism, without any other risks on our health;

- The application works as a personal trainer helping the subject make a correct movement and also motivating the user by confirming that he does a proper workout;
- The study can serve as a support for the future development of the sport related mobile applications and future educational programs.

4. Proposals

- We recommend the usage of this special mobile smartphone application for every person regarding they are exercising home or at the gym;
- Promoting this application to the young generation, the ones that are most in need of a pro-movement gadget;
- Developing other applications for other type of exercises like pushups, pull ups, abdominal exercises etc;
- Placing the application on the Android Market or IOS store in order to generate revenue, that can be used in further development of applications;
- Developing applications for specified sports like dancing, gymnastics, basketball, football, ice skating, athletics etc.

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