

## YOUNG PHOTONICS CONGRESS 2021

My research project fit into two of the YOUNG PHOTONICS CONGRES 2021 categories:

- ✓ LIGHT AND ITS APPLICATIONS.
- ✓ LIGHT APPLICATIONS FOR INFORMATION AND COMMUNICATIONS.

**Project:** The Shooting Counter, B-Shoot, BK-Shoot, ishoot. ShooTec

My research project shows how to create and program a system with an application with Arduino, Android and light for tracking, directly, basketball shots in individual or couples shooting workouts.

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4<sup>th</sup> of ESO

## RESEARCH OBJECTIVES

1. Know what is artificial intelligence (IA) and big data applied to basketball.
2. Create and programming an application with Arduino and Android for to record, directly, basketball shots in our shooting workouts.
3. Deepen and put into play applications where light is essential.
4. Design light box to put the whole mechanism of the application easily and easy to place in different basketball hoops.
5. Organize a charity contest (to play with the system to know the workout statistics in real-time and after the training) , contributing to objectives 3, 4 and 10 of the ODS , to do the pilot test with the players of the teams in the quarry my basketball club (Bàsquet Manresa - BAXI) MANRESA in Manresa ( Barcelona) and with the primary/secundary students of Oms I de Prat School.

## COMPONENTS USED IN THE PROJECT / SOFTWARE APPS

### 1. ARDUINO IDE

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux.

### 2. MIT APP INVENTOR

App Inventor is a software development environment created by Google Labs for the development of applications for the Android operating system .

## MATERIALS

1. *MCU 8-BIT, ARDUINO NANO, AVR, ATMEGA328*
2. *HC-05 TRANSMISSION MODULE VMA302.*
3. *E18-D80NK ADJUSTABLE INFRARED PROXIMITY SENSOR MODULE*
4. *VIBRATION SENSOR*
5. *HUMIDITY AND TEMPERATURE SENSOR*
6. *THROUGH HOLE RESISTOR, 100 OHM, MCCFROW4J SERIES, 250 MW, ± 5%, AXIAL LEADED, 250 V*
7. *RESISTOR 1K OHM*
8. *1 RESISTOR 2,21K OHM*
9. *1 RESISTOR 1K OHM*
10. *3 RESISTOR 100K OHM*
11. *8MM RGB LED LAMP COMMON ANODE (10 PCS)*
12. *9V BATTERY (GENERIC)*

## RESULTS

Test of the system created that allows to practice basketball shooting by seeing the statistics in real time via your mobile phone.

## CONCLUSIONS

- I have created a system proved to be very accurate, with very few false positives and rare false negatives. In addition, our system allows you to continue training or play at home floating the pandemic or confinement.
- My research work supports three of the UNESCO Sustainable Development Goals (SDGs); 3, 4 and 5. (Good health and well-being, quality education and gender equality).
- It is really amazing to play with the system to know the workout statistics in real-time and or after the training, game against mates or participating in a contest.