BK-SHOOT Statistics

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BK SHOOT PILOT TEST VIDEO

ABSTRACT

MY RESEARCH PROJECT FIT INTO TWO IMPORTANTS ASPECTS OF LIGHT AND ITS APPLICATIONS AND ALSO, APPLICATIONS FOR INFORMATION AND COMMUNICATIONS. BK-SHOOT STATISTICS PROJECT SHOWS HOW TO CREATE AND PROGRAM A SYSTEM WITH AN APPLICATION BY USING ARDUINO, ANDROID FOR TRACKING, DIRECTLY, BASKETBALL SHOOTS IN INDIVIDUAL OR COUPLES SHOOTING WORKOUTS. IT'S A VERY INTERESTING PROJECT WHICH COVERS MANY CONCEPTS AND COMPETENCES OF CURRICULAR AREAS OF HIGH SCHOOL – SUCH AS MATHEMATICS, TECHNOLOGY, PHYSICS, ETC.
BK-SHOOT STATISTICS CONTRIBUTES TO ACHIEVING FIVE OF THE SUSTAINABLE DEVELOPMENT GOALS (SGDS) OF THE UNESCO 2030 AGENDA.

KEYWORDS: ARTIFICIAL INTELLIGENCE TECHNOLOGY, BASKETBALL BIG DATA, ARDUINO AND ANDROIDS APLLICATIONS, STATISTIC APP.

THEORETICAL INTRODUCTION

ARTIFICIAL INTELLIGENCE IS A BRANCH OF COMPUTER SCIENCE. IT IS A NEW TECHNICAL SCIENCE THAT RESEARCHES AND DEVELOPS THEORIES, METHODS, TECHNOLOGIES AND APPLICATION SYSTEMS FOR SIMULATING, EXTENDING AND EXPANDING HUMAN INTELLIGENCE. ONE OF ITS MAIN GOALS IS TO ENABLE MACHINES TO PERFORM COMPLEX TASKS THAT NORMALLY REQUIRE HUMAN INTELLIGENCE TO COMPLETE. IN RECENT YEARS, ITS RAPID DEVELOPMENT HAS BEEN WIDELY USED IN SPORTS, ECONOMIC, AND OTHERS FIELDS.

BASKETBALL IS AN IMPORTANT ENDEAVOR IN THE LIVES OF MANY PEOPLE. ONE REASON IS THAT MANY OF THEM ARE ENGAGED IN THIS SPORT AS A WAY OF EXERCISING AND IMPROVING THEIR HEALTH AND LIFE STYLE. ANOTHER REASON IS THAT WATCHING AND KEEPING TRACK OF PROFESSIONAL SPORTS LIKE BASKETBALL IS A MAJOR ACTIVITY SHARED BY BOTH YOUNG AND ADULT INDIVIDUALS.

BIG DATA ANALYZES THE VARIOUS FACTORS OF THE PLAYERS THAT GIVE AN INSIGHT TO THE PLAYERS TO ANALYZE THEIR OWN STRENGTHS AND WEAKNESSES AS WELL AS THAT OF THE COMPETITORS THEREBY IMPROVING THE TEAM'S PERFORMANCE. WITH BIG DATA, IT IS POSSIBLE TO ANALYZE LARGE AMOUNTS OF THIS DATA AND UTILIZE IT. SINCE THERE IS A HIGHER DEMAND FOR THE SPORTS STATISTICS, BIG DATA IS THE IDEAL TECHNOLOGY FOR SPORTS LIKE BASKETBALL.

BK-SHOOT STATISTICS OBJECTIVES

1. KNOW WHAT IS ARTIFICIAL INTELLIGENCE (IA) AND BIG DATA (BD) APPLIED TO BASKETBALL.

2. CONDUCT INTERVIEWS WITH BASKETBALL PROFESSIONALS AND BIG DATA ENGINEERS.

3. CREATE AND PROGRAMMING AN APPLICATION WITH ARDUINO AND ANDROID FOR TO RECORD, DIRECTLY, BASKETBALL SHOTS IN OUR SHOOTING WORKOUTS.

4. DEEPEN AND PUT INTO PLAY APPLICATIONS WHERE LIGHT IS ESSENTIAL.

5. DESIGN A DYNAMIC ANCHORAGE SYSTEM OR LIGHT BOX TO PUT THE WHOLE MECHANISM OF THE APPLICATION EASILY IN DIFFERENT BASKETBALL HOOPS.

6. 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, 5, 11 AND 16 OF THE SGDS (UNESCO), TO DO THE PILOT TEST WITH THE PLAYERS OF THE TEAMS IN THE QUARRY.
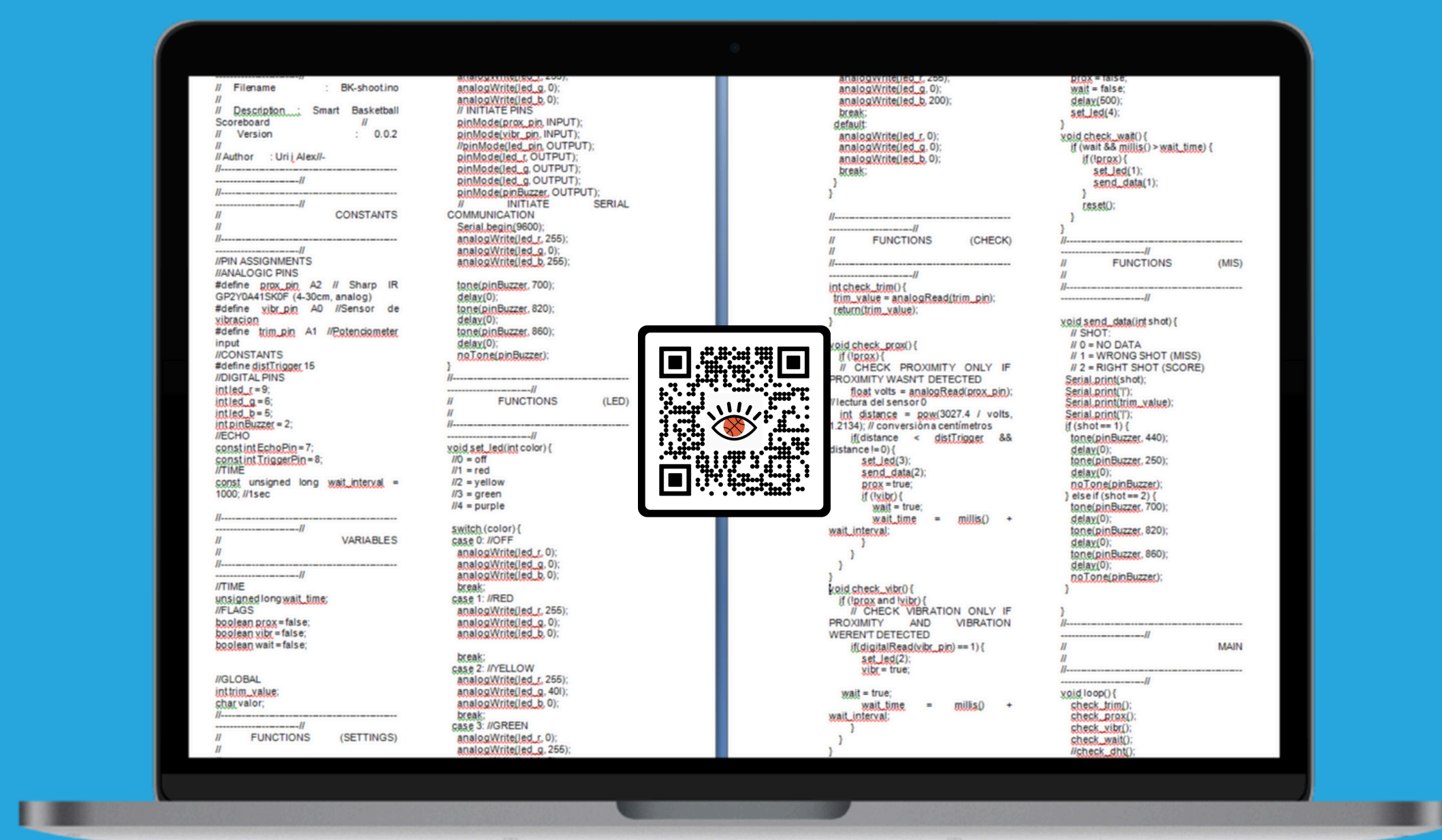
MATERIALS AND SOWFTWARE APPS

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, CCFR0W4J, 250, AX. LEADED 250 V
7. RESISTOR 1K OHM.
8. RESISTOR 2,21K OHM.
9. RESISTOR 1K OHM.
10. RESISTOR 100K OHM.
11. ·8MM RGB LLUM LEDCOMMON ANODE (10 PCS)
12. 9V RECHARGEABLE BATTERY.
13. BOX TO PLACE THE APPLICATION.
14. 2 MAGNETS TO PLACE THE APPLICATION IN THE BASKET.

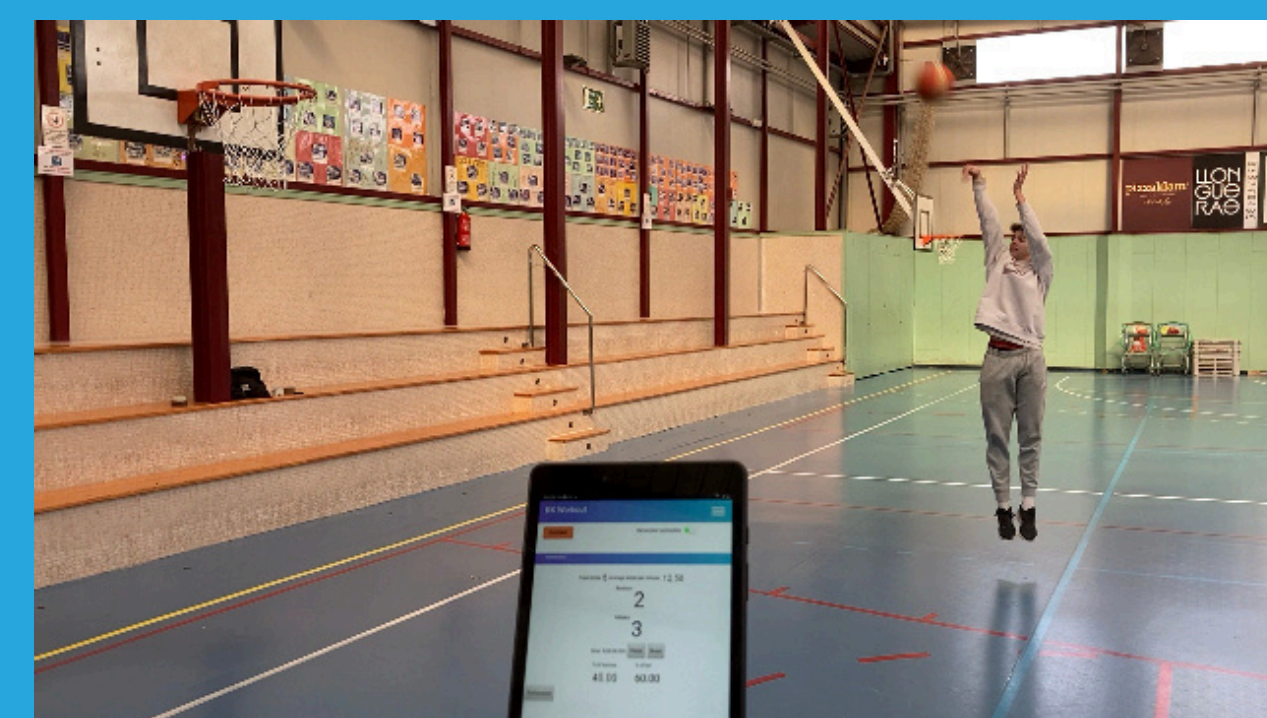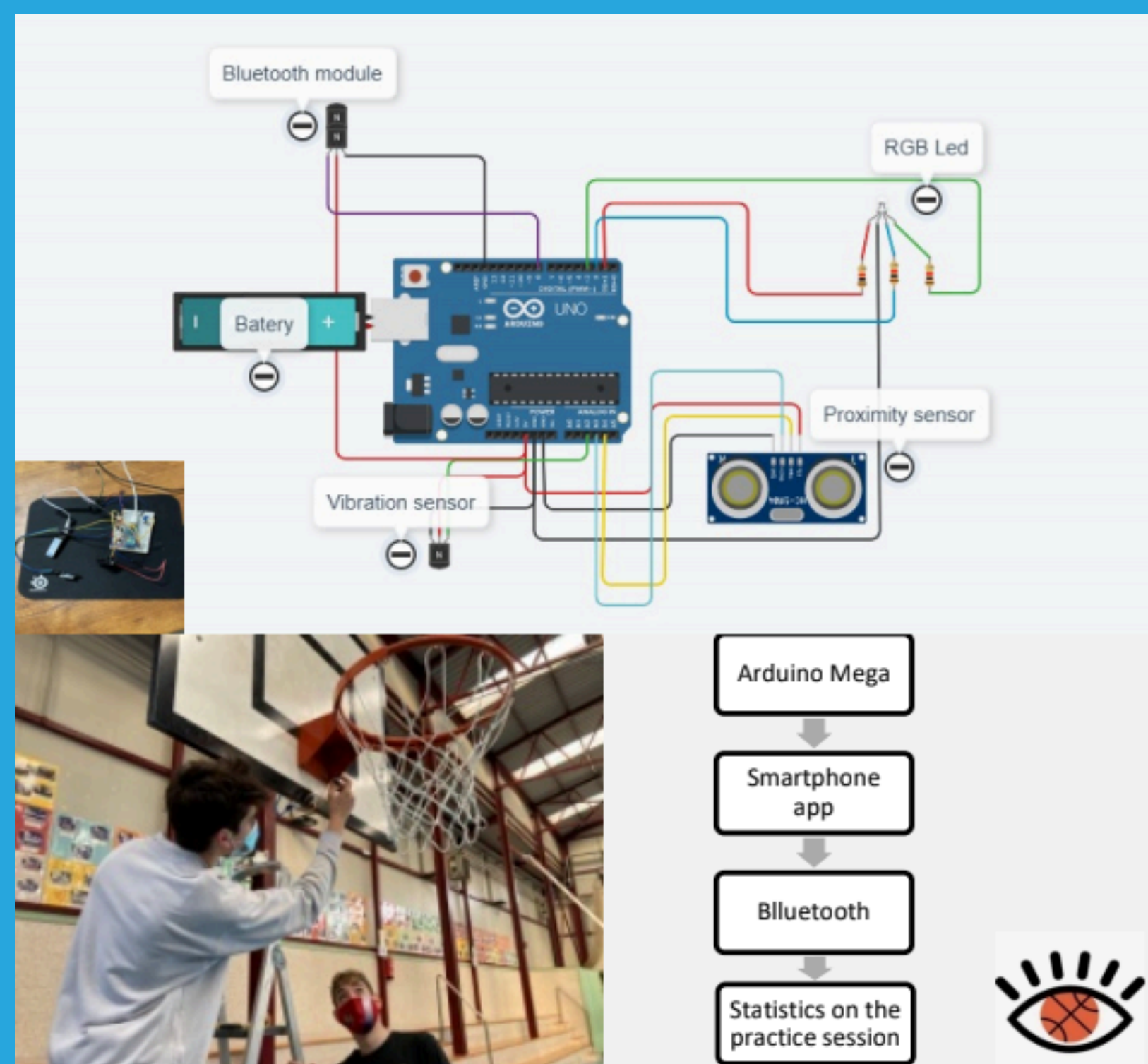**SOFTWARE APPS** USED FOR THE DEVELOPMENT OF BK-SHOOT APPLICATION:

ARDUINO

MIT APP INVENTOR

BK-SHOOT ARDUINO AND MIT APP INVENTOR CODE:

SCAN TO SEE MIT APP INVENTOR CODE

HOW DOES BK-SHOOT STATISTICS WORK?

Bluetooth module
RGB Led
Batery
Proximity sensor
Vibration sensor

Arduino Mega
Smartphone app
Bluetooth
Statistics on the practice session

THE MECHANISM OF BK-SHOOT IS VERY SIMPLE, IT'S BASED ON 2 MAIN SENSORS: THE VIBTATION AND THE PROXIMITY ONE. THE BK-SHOOT SETUP'S ARDUINO MEGA COMMUNICATES WITH A CUSTOM SMARTPHONE APP OVER BLUETOOTH, AND DISPLAYS STATISTICS ON THE PRACTICE SESSION. IT EVEN PLAYS NOTIFICATION SOUNDS FOR SCORES AND MISSES.

RESULTS AND STATISTICAL DATA PROVIDED BY BK-SHOOT

BASKETBALL HAS CHANGED VERY LITTLE SINCE IT WAS INVENTED BY PROFESSOR JAMES NAISMITH IN 1891. ITS ESSENCE REMAINS US EXACTLY THE SAME AS OUR BK-SHOOT STATITSTIC APP, THROWING THE BALL INTO THE BASKET. OUR APPLICATION INTERPRETS AND DISPLAYS THIS INFORMATION. SPECIFICALLY, IT SHOWS THE FOLLOWING DATA, WHICH IS UPDATED IN REAL TIME:

1. TOTAL NUMBER OF ATTEMPTS (SUCCESSFUL + FAILED)
2. AVERAGE ATTEMPTS PER MINUTE: IS CALCULATED BY AVERAGING OF THE TOTAL NUMBER OF ATTEMPTS WITH RESPECT TO THE TIME THAT THE TRAINING LASTS UNTIL THAT MOMENT.
3. THE TOTAL NUMBER OF SUCCESSFUL ATTEMPTS (BASKETS).
4. THE TOTAL NUMBER OF FAILED ATTEMPTS (MASSES).
5. THE SUCCESS RATE.
6. THE ERROR RATE.
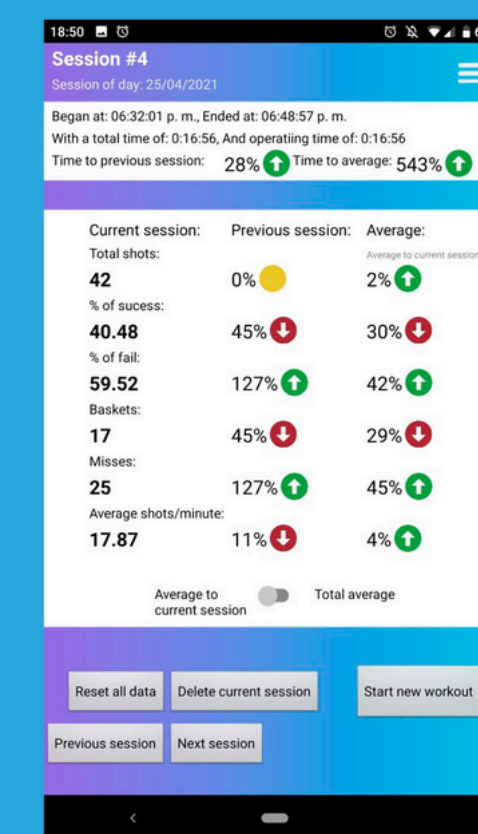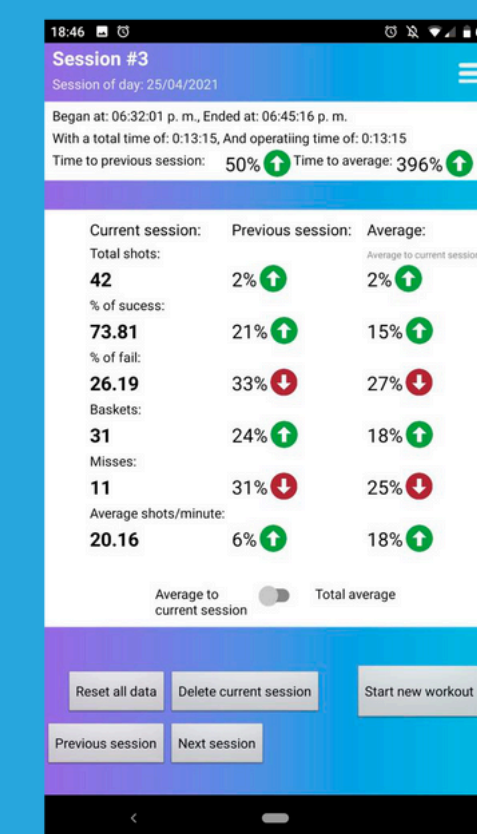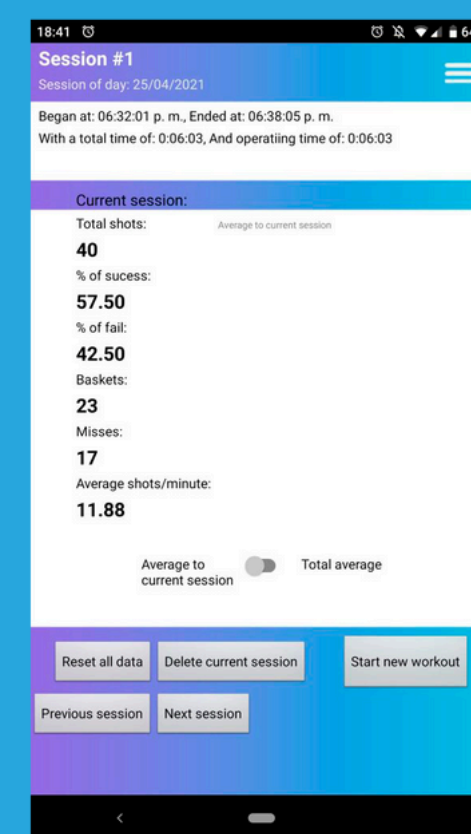
IN ADDITION, MY INNOVATIVE APPLICATION ALLOWS YOU TO EXPORT YOUR DATA AND GRAPHS IN AN EXCEL DOCUMENT.
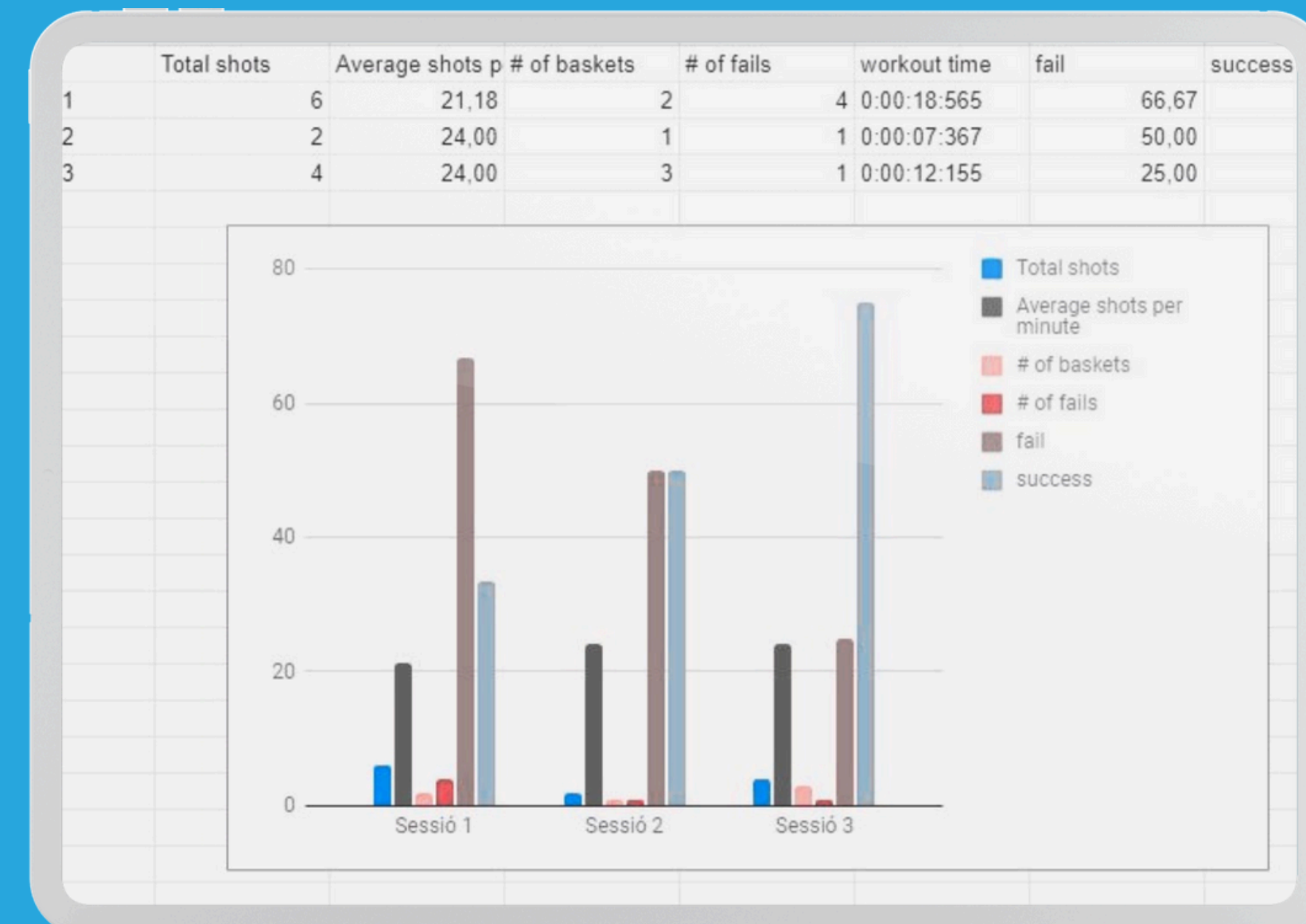
THINKING AND CONCLUSIONS

1. I HAVE CREATED A SYSTEM PROVED TO BE VERY ACCURATE, WITH VERY FEW FALSE POSITIVES AND RARE FALSE NEGATIVES.IN ADDITION, THE SYSTEM ALLOWS YOU TO CONTINUE TRAINING OR PLAY AT HOME FLOATING THE PANDEMIC OR CONFINEMENT.
2. WITH BK-SHOOT I PROMOTE HEALTHY HABITS AND IS VERY USEFUL TO USE DURING CORONAVIRUS CONFINENCE BECAUSE YOU CAN PLAY WITH OTHER TEAM OR CLASS COMPANIONS.
4. 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.
5. MY RESEARCH WORK SUPPORTS FIVE OF THE UNESCO SUSTAINABLE DEVELOPMENT GOALS (SDGS).

3 GOOD HEALTH AND WELL-BEING   4 QUALITY EDUCATION   5 GENDER EQUALITY   11 SUSTAINABLE CITIES AND COMMUNITIES   16 PEACE, JUSTICE AND STRONG INSTITUTIONS