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ADVANCED TARGET SYSTEM FOR SHOOTING

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Abstract:

Generally, the military plays a key role in protecting their countries mainly from terroirs attacks. During the training section of military officers one of the main parts is shooting targets from different positions. So, we are designing a project for increasing the accuracy of calculation of the target shooting ability of a person. This project is not only for military it is useful for any shooting trainings. Our project is to calculate the accuracy of shooting targets and even it also avoids the damage of targets unnecessary. In this project it has two types of targets available that is fixed target and movable target. When a person shoots a target, the percentage is calculated before the bullet hits the target and it will be displayed on LCD display this system is called as fixed target system. For this target we are using ultrasonic sensor and LCD display. When a person shoots a target, the percentage is calculated after hitting the target and it will be displayed on LCD display this system is called as movable target the name it self tells that it is a movable target in training time. The project will give all the details like if the person is selected, the person is disqualified or needs some more training depending on the shooting skills of that person. In this way our project will help in selecting the suitable person easily and accurately more over it also reduces the cost for preparation of targets.

1. INTRODUCTION:

There are different types of targets present which are used in different fields like in sports, military, and police training for the selection of the candidates. According to the need preferred targets are chosen. According to the serve done we have found that there are 4 different types of targets present they are paper, steel(reactive), clay and explosive targets. Paper targets are the basic targets used these are cost effective but not much useful, the one of the basic shapes is bull's eye. Another type is steel type targets which are also called as reactive targets because they produce sound based on the shooting skills. These are better than paper targets because this can be modified and can be reused and bring some new look by a simple painting process. The next type is clay targets these are made with the help of clay material they will gets burst when bullet hits the target there are so many drawbacks in this clay targets. The last is explosive targets in these two different explosive chemicals are mixed and used these are used as binary explosive targets. Due to cost and most danger chemicals this will not much used and in so many states the government has rejected this type of targets especially in the forest areas.

For solving all these problems, we have designed new type of targets with high accuracy and cost effective. By using these targets there will be no need of

changing targets regularly and money invested on targets can also be reduced in addition to that eligible person can be selected automatically without any human involvement.

2. METHODOLOGY:

In this methodology after gathering the information about different types of targets and scoring methodologies the people are facing lots of problems in knowing exact area where the target is hit by the Shotter and it becomes a major problem to knowing who has better shooting skills. So, to overcome all these problems we have implemented a device called "advanced target system for shooting". In implementing this system, we have used two different methodologies one is for fixed target and another is for movable target.

Fixed targets are made with the help of ultrasonic sensors, LCD display, Arduino UNO, servo motor. The main sensors of the project are ultrasonic sensors which performs the basic operation for calculating the score of shooting. We have placed two sensors in the form of 'L' shape which is few cm away from the target. The two ultrasonic sensors are arranged in such a way that when a bullet is fired after passing through the sensors the corresponding percentage will be displayed on the LCD display and the target will bend backward before the bullet hits the target.

Movable targets are made with the help of sound sensors, LCD display, Arduino UNO, DC motor, motor driver. sound sensor plays a key role in analysing the score of the shooter while the target is moving. In this system the target will be moves from left to right as well as right to left. Behind the target three sound sensors are placed in such a way that whenever the bullet hits the target the corresponding sensor will be activated and the respective outcome will be displayed.

3. WORKING:

In fixed target system one of the ultrasonic sensor is placed in such a way that it is used to analyze the target in the direction of X axis and another sensor is placed in such a way that it is used to analyze the target in the direction of Y axis. When the bullet is recognized by the sensors the respective percentage will be displayed on the LCD display as per the program mentioned in the Arduino. The Arduino is programmed in such a way that when the ultrasonic sensor recognizes the bullet in the middle of the target the 100% value is printed on LCD display in the similar way the 80% as well as 60% will be printed on LCD display according to the position of the bullet in addition to this when ultrasonic sensor detects the bullet the target is bend backward with the angle 90 degree with the help of servo motor.

Coming to movable targets sound sensors are placed behind the target in which the target is moved in the direction of left to right as well as right to left with the help of DC motor. Whenever the bullet hits the target the corresponding sound sensor will be activated and the percentage will be displayed on LCD on display as programed in the Arduino. In the similar way all the sound sensor will be activated according to the target hit by the shooter and the corresponding percentage will be displayed on LCD display.

4. RESULTS:

Fig 1: final kit for fixed target for displaying the shooting percentage.

The fig1 indicates that total setup of the target for displaying the shooting accuracy.

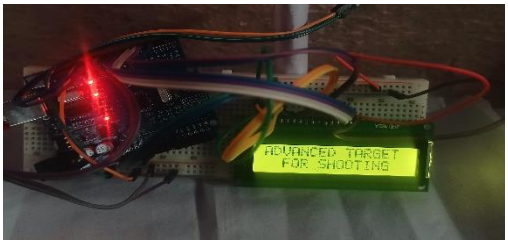

Fig 2: Displaying the name of the project on LCD display.

Fig2 indicates the message displayed when no target is sensed by the ultrasonic sensors.

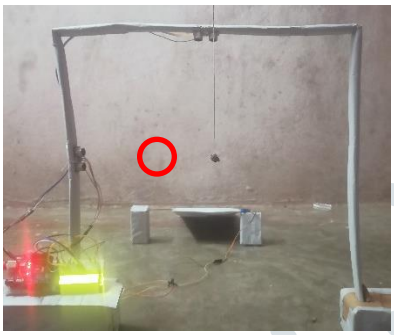

Fig 3: The position of the bullet before hitting the target.

Fig3 indicates the position of the bullet which is in the range of 100% with respect to the target.

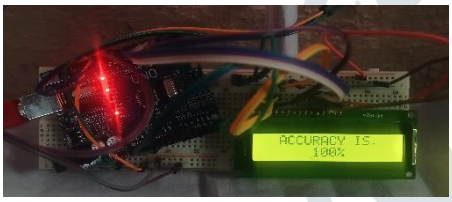

Fig 4: Displaying message when bullet is in the range of 100%.

Fig4 indicates the message displayed when the bullet is in the range of 100% with respect to the target.

Fig 5: The position of the bullet before hitting the target.

Fig5 indicates the position of the bullet which is in the range of 80% with respect to the target.

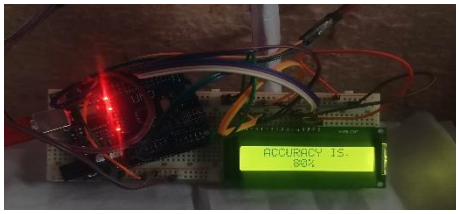

Fig 6: Displaying message when bullet is in the range of 80%.

Fig6 indicates the message displayed when the bullet is in the range of 80% with respect to the target.

Fig 7: The position of the bullet before hitting the target.

Fig7 indicates the position of the bullet which is in the range of 60% with respect to the target.

Fig 8: Displaying message when bullet is in the range of 60%.

Fig8 indicates the message displayed when the bullet is in the range of 60% with respect to the target.

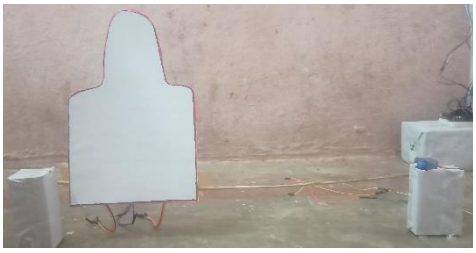

Fig 9: The final kit of the movable target.

Fig9 indicates the total setup pf the movable target which moves from left to right or right to left with the help of DC motor.

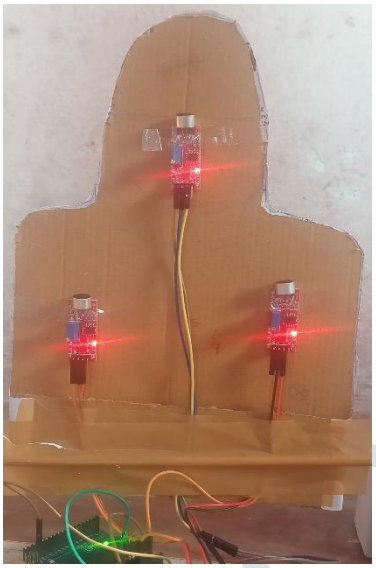

Fig 10: The arrangement of sound sensor behind the target.

Fig10 indicates the positioning of the sound sensors for displaying different percentages.

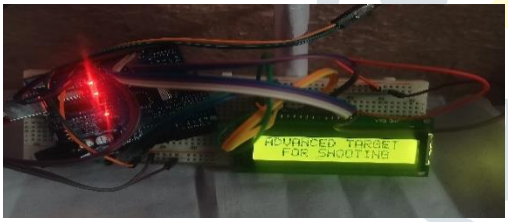

Fig 11: Displaying the name of the project on LCD display.

Fig11 indicates the message displayed when no target is sensed by the sound sensors.

Fig 12: The activation of the sound sensor.

Fig12 indicates that the sound sensor gets activated when bullet hits in the range of sound sensor placed at the top of the target.

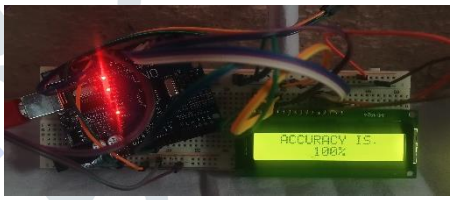

Fig 13: Displaying message when bullet is in the range of 100%.

Fig13 indicates the message displayed when the bullet hits the target which is in the range of sound sensor that was placed in the position of head.

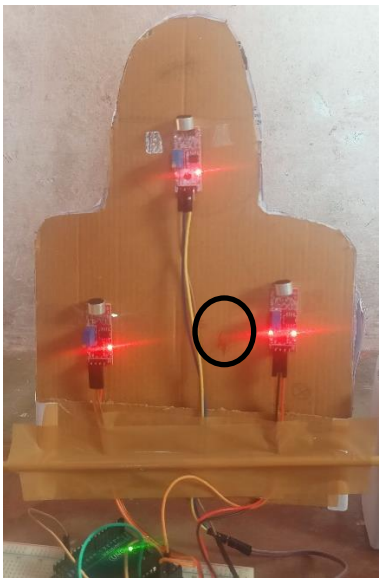

Fig 14: The activation of the sound sensor.

Fig14 indicates that the sound sensor gets activated when bullet hits in the range of sound sensor placed at the left of the target.

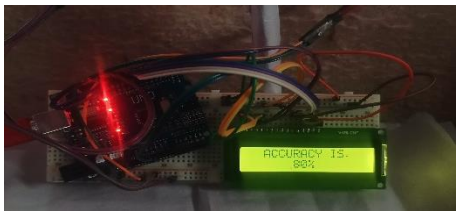

Fig 13: Displaying message when bullet is in the range of 80%.

Fig13 indicates the message displayed when the bullet hits the target which is in the range of sound sensor that was placed in the position of left side.

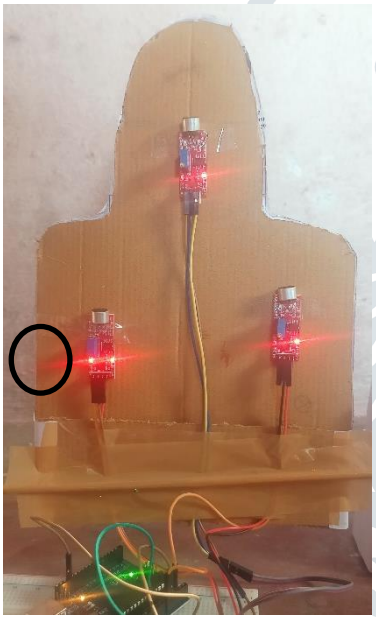

Fig 17: The activation of the sound sensor.

Fig17 indicates that the sound sensor gets activated when bullet hits in the range of sound sensor placed at the right of the target.

Fig 13: Displaying message when bullet is in the range of 60%.

Fig13 indicates the message displayed when the bullet hits the target which is in the range of sound sensor that was placed in the position of right side.

5. CONCLUSION:

From the study of result we can conclude that the "advanced target system for shooting" is a very useful device in analysing the shooting skills of the person who is shooting the target. The accurate scoring will be displayed with the help of ultrasonic sensor in fixed targets and sound sensors in movable targets. Which reduces human involvement and increases accuracy and reduces the cost of the targets.

FUTURE SCOPE:

The future scope of our project is to introducing the excel sheet for automatically storing the total data and calculating the average by using the data present in excel sheet. The final result will be given according to the average result scored by the person.

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