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Automatic Firing Tank with Evading Target and Land Mines Detection & Diffusion Usage

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ABSTRACT: Decades of a year have been passed and the military is ruling in destroying an army on the ground during the war time. From so many past research and hard work of great scientists all over the world have been contributing so much to increase their countries strength for defeating the enemy on the ground. This research gives the upgrade and strong defensive and attacking power to the military forces reducing the manpower and decreasing the threat to civilians. As in the military war time, the tanks have been playing a major role in destroying the enemy so much and in addition, the tanks also can sustain good attacking power by an enemy. During our research, we found that at present military uses two vehicles separately for attacking and detecting land mines that to include manpower in some cases. In our project, we are going to use only one tank which is incorporated with both the function combine attacking & evade of target and land mine detection. Installation of several highly sophisticated sensors (ultrasonic, IR, color, camera, metal etc...) and motors (servo, DC, gear, pumping etc...) which will work accordingly on the basis of C-programming which is incorporated at the microcontrollers. These sensors will control the tank for the automating firing when an enemy is approaching near to it and also for evading of attack and also to detect land mines. This tank may be switched over fully automated mode when there is no friendly army available in the field. These sensors can be changed to higher versions for their long range and military use.

KEYWORDS: military, tank, sensors, motors, landmines, automatic firing, evading target, detection

I. INTRODUCTION

A. PROJECT DEFINITION

A tanker is a large heavily armed fighting vehicle with tracks and large tanker gun that is designed for front-line combat. Modern tanks are mobile land weapons platform mounting a large-calibre cannon in a rotating gun turret. Combining this with the heavy vehicle armor which provides protection for the crew inside it, the vehicle's weapons, and tanks propulsion systems, operational mobility, due to its use of tracks rather than wheels, which allows the tanker to move over rugged terrain and be positioned on the battlefield in advantageous locations.

B. PROJECT JUSTIFICATION

Our project aims at designing a sophisticated tanker which is adaptable to the environment either depending on the color pattern or an image background on the environment. The tanker is automated by using several sensors such as a color sensor, proximity sensor, and infra-red sensor. They are capable of taking automatic decisions by sensing the environment. Modern tankers utilize a sophisticated fire - control system, including range finders, computerized fire control and attacks, stabilizers, which are designed to keep the cannon stable and aimed even if the hull is turning or faces shaking effect, making it easier for the operators to fire on the move and/or against moving or stable targets.

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C. EVOLUTION

The tank history was begun during World War-I when armored all-terrain fighting vehicles were first deployed in the war as a response to the problems of trench warfare. Though the tank was unreliable and crude, tank eventually becomes the essential part of the war for ground armies. By World War II, and before the tank design had advanced significantly, and tanks were used in quantity in all land theaters of the war at any time. The Cold War saw the rise of modern tank doctrine and the general purpose main battle tank. The tank still provides the backbone to land combat operations in the 21st century.



Fig 1: M47 Korean Tank

Few recognized during World War I that the means for returning mobility and shock action to combat was already present in a device destined to revolutionize warfare on the ground and in the air. The new concept of the internal combustion engine, which had made possible the development of the tank and eventually would lead to the mechanized forces that were to assume the old roles of horse cavalry and to loosen the grip of the machine-gun on the battlefield.

With increased firepower and protection, these mechanized forces would, only some 20 years later, become the armor of World War II. When self-propelled artillery, the armored personnel carrier, the wheeled cargo vehicle, and supporting aviation - all with adequate communications - were combined to constitute the modern armored division, commanders regained the capability of manoeuvre.



Fig 2: Putin's New WundeWaffe

II. MATERIALS AND METHODOLOGY

A. EMBEDDED SYSTEM

Embedded system is a computer system which is a dedicated function within a large mechanical or electrical system often with real-time computing constraints. It is a part of computing device often including the mechanical and electrical part. Embedded systems are designed to perform multiple tasks at a time rather than a single task. Even though embedded systems can be of a smaller size too with multiple functions does not mean that they cannot perform more task but they can do. The program cited in the embedded system stored in any USB device or a flash memory. For running this it does require only small amount of power do not big objects such as a keyboards etc.

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B. EMBEDDED C

Embedded programming C is used for the enhance programming for the efficient functioning and desired output of the content. This programming is reliable and easy to understand use. We can specify each task clearly which can be performed in any manner as the way we want to be work for it.

The coding use in this programming here is created and developed by using MPLAB IDE (Microprocessor Lab) (Integrated Development Environment). This software gives the high potential and accuracy for coding to be work properly.

C. WAR TANKS

War tanks are also termed to be known as main battle tanks (MBT), it fills up with armed protected fire munitions which will directly fire on the enemy. Tanks have been using since and before the World War-I as it is reliable to use during wars. Its hull is capable of defending the heavy attacks on it. Since then it is used by the man inside the tanks.

As the time passes and technology in the world evolves the tanks are also been upgrading since the attack is also getting upgraded. But after a certain period of time manufacturing rate of tanks in certain countries decreases due to certain constraints in the tanks.



Fig 3: Obrum Advanced Stealth

Nowadays automatic system is on high rate. So seeing the constraints and record from certain previous studies we decided to move on towards the automatic tank. This tank will help the army to control it without being present inside the tank and reduces the cost and time but increase the efficiency and reliability.

D. AUTOMATIC SYSTEM

It is a system which is operated automatically without being the presence of man. This system is often called as Unmanned System. Unmanned system is at the high rate of evolution in the air and space where it is found to be more and more effective and reliable.



Fig 4: UAV

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Our tank is made automatic which is going to be controlled with the help of several microcontrollers and microprocessors. To perform several works at a time there is a fixation of certain sensors and others equipment. All the sensors will work according to the programming which is been initially fed in the system and run through it. The functions such as automatic firing, evading target and land mines detection can be done either simultaneously or at a time.

III. RELATED WORK

A. SENSORS

Sensors work accordingly with the help of feeded programming. In our work, we have used sensors such as ultrasonic sensors, proximity sensors, IR sensors, camera sensors etc and several motors to perform mechanical work. Every sensor has their own specific work which combines to perform all the relevant task of the tanks which included automatic firing, land mines detection, evading target.

When the target will approach near the tank in its range of detecting the automatic firing system will activate and fire the object. And also when any landmines are found to be in the range of tank it will detect the landmines and also it informs about the danger with the indicating LEDs and buzzer sound.

B. DESCRIPTION

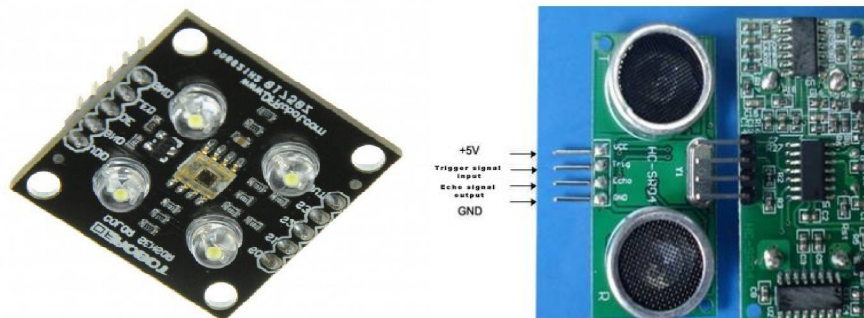
Inductive proximity sensor which is use to sense the metal has the operating voltage range of 5v DC to 30v DC. It is 12mm and 18mm in length and has 12mm and 18mm Dia respectably as shown in fig 5. It is used to find out and counter the land mines. Land mines took as to be a metal.



Fig 5: Proximity sensors

Ultrasonic sensor here requires only 5v DC power supply and utilizes current less than 2mA. The sensor as it using for prototype model the range of measuring is from 2cm-4m as shown in fig 6. The sensor will measure the distance and avoid the obstacles.

Color sensor operated on 5v DC have the serial data output for RGB values. It has the UART interface for the direct connection to any MCU as shown in fig 7. It uses for detecting color and sorting the operation of process control.



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Fig 6: Ultrasonic Sensor

Fig 7: Color Sensors

Servo motors with four hand used here have operating voltage of (4.5-6) v DC and have an operating angle of 170° approx. This is work by pulse width modulation with a pulse rate of approx... 20ms.

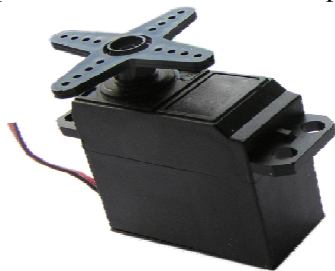


Fig 8: Servo Motor



Fig 9: Gear Moto

Gear motor uses to bring tab at the right position and also to move the tank with speed of 100 RPM. It uses only by (5-9) v DC. With the help of Gear motor (fig 9), we can move the tank in the desired position and at desired place due to its unique function.

Two kinds of relays are used. Single channel relay shown in fig 10, works on the electromagnetic principle used for interfacing microcontroller with the output fields instruments. Double channel relay shown in fig 11 have the output voltage of 5v dc and used for a drive the motor in 2 directions.



Fig 10: Single Channel Relay



Fig 11: Double Channel Relay

All these sensors being incorporated into a single platform with proper connection to perform the accurate task. The model of tanks is just a prototype with the small range of sensors this same can be done in actual model by using industrial sensors and also the relevant sensors which are using for defense purpose.



Fig 12: Buzzer

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IV. RESULTS

Hence as per the suggested prototype model design, deflection of the tab is shown and target is being fired as it approaches near to it. Also, land mines also detected and countered it.

V. FUTURE CONCEPT

The system has to successfully implement in real time model. The model may be working automatically without the presence of man inside it with the accurate working of the object and also achieving all the task those included in the

VI. CONCLUSION

With the successful completion of this work the work of army has been reduced and also our deployed army life has been able to save from being destroyed. Which in turn reduced the cost of medical treatment which was used to spend on army peoples after being affected by land mines or attack on a tank. This gave the army people for self-confidence and working ability.

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