



MISSILE TRACKING AND AUTO ALERT OVER IOT

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ABSTRACT

The purpose of this project is to design and construct automatic missile detection and destroying system. This system is designed to detect the target (missile) moving in multiple directions. The target destroying system moves automatically in the direction of missile and fires it upon fixing the target. This system consists of an intelligent sonar based object tracking system that continuously monitors the target. Upon detecting the target it sends the target's location to a Central Control System. The Central Control System takes the action of moving the firing mechanism in the direction of target (missile). Upon fixing the direction, it sends the control command to firing system for attacking the target. In this project we are making use of ultrasonic radar system and a DC geared motor driven firing unit interfaced with a Microcontroller based control unit. The ultrasonic sensor movement is maintained by the servo motor fixed within it. The dc motor is made to revolve through fixed angles; if object is detected then the angle position is sent as the input to the launcher. The launcher will release the missile fixed within it because the Ultrasonic sensors covers larger sensing distance and it can detect the target in all the lighting conditions. The programming of Microcontroller is done using Embedded 'C'.

1. INTRODUCTION

The purpose of this project is to design and construct automatic missile detection and destroying system. This system is designed to detect the target (missile) moving in multiple directions. The target destroying system moves automatically in the direction of missile and fires it upon fixing the target. This system consists of an intelligent sonar based object tracking system that continuously monitors the target. Upon detecting the target it sends the target's location to a Central Control System. The Central Control System takes the action of moving the firing mechanism in the direction of target (missile). Upon fixing the direction, it sends the control command to firing system for attacking the target. In this project we are making use of ultrasonic radar system and a dc motor driven firing unit interfaced with a Microcontroller based control unit. We prefer ultrasonic sensor to IR sensor, because the Ultrasonic sensors covers larger sensing distance and it can detect the target in all the lighting conditions (day or night). The programming of Microcontroller is done using Embedded 'C'. An embedded system is a combination of software and hardware to perform a dedicated task. Some of the main devices used in embedded products are Microprocessors and Microcontrollers



Microprocessors are commonly referred to as general purpose processors as they simply accept the inputs, process it and give the output. In contrast, a microcontroller not only accepts the data as inputs but also manipulates it, interfaces the data with various devices, controls the data and thus finally gives the result. The Missile tracking and auto collision system using ARDUINO Microcontroller is an exclusive project that can move the target aiming gun according to the instructions given by microcontroller and also alerts through LCD when any missile is being detected by it. The thesis explains the implementation of “Missile tracking and auto collision system” using ARDUINO microcontroller. RADAR is an object detection system which uses Microwaves. Microwaves are nothing but the radio waves. It uses microwaves to determine the Range, Altitude and Direction or Speed of objects. The radar dish or antenna transmits pulses of radio waves or microwaves which bounce off any object in their path. RADAR systems come in a variety of sizes and have different performance specifications. Some RADAR systems are used for air-traffic control at airports and others are used for long range surveillance and early-warning systems. A RADAR system is the heart of a missile guidance system. Technology in 21st century puts an emphasis on making the devices autonomous, be it self-driving car or a defense system all are being made autonomous. In this modern era there is advancement in radar system also having privileges over the existing systems. The term RADAR itself, not the actual development, was coined in 1940 by United States Navy as an acronym for Radio Detection and Ranging. A radar system is the heart of a missile guidance system. Small portable radar

systems that can be maintained and operated by one person are available as well as systems that occupy several large rooms. Radar was secretly developed by several nations before and during the World War II. The term RADAR itself, not the actual development, was coined in 1940 by United States Navy as an acronym for Radio Detection and Ranging. The modern uses of radar are highly diverse, including air traffic control, radar, astronomy, air-defense systems, antimissile systems, marine radars to locate landmarks and other ships; aircraft anti-collision systems; ocean surveillance systems, outer space surveillance and rendezvous systems; meteorological precipitation monitoring; altimetry and flight control precipitation monitoring; altimetry and flight control systems; guided missile target locating systems; and ground penetrating radar for geological observations. High tech radar systems are associated with digital signal processing and are capable extracting useful information from very high noise levels.

2. LITERATURE SURVEY

Missile Detection by Ultrasonic and Auto Destroy System. (May 2014). Samir Chopra, Suman Bharti, Tarun Singh Negi, Prof. P.D Kulkarni, In this paper they are attempting to make a robotic platform along with a stepper motor fitted with ultrasonic sensor is used to automatically locate and aim at a moving target and successfully destroys it. The control system is ATmega32 is an 8-bit high performance microcontroller of Atmel’s Mega AVR family with low power consumption [1]. This system takes decision to detect and destroy the moving missile. It sends control signal to firing unit to



destroy missile. The Ultrasonic transceiver (Transmitter & Receiver) detects missile object and displays the missile direction on LCD through Microcontroller. If there is any target within the detection range, the application will turn ON the Laser gun to the nearest detected target and fires. A buzzer alarms when any of the ultrasonic sensor identifies the missile to alert the nearest people. They have introduced wireless camera for taking the visuals at war field. A RF transmitter and receiver are used for controlling robotic platform [2]. Microcontroller Based Missile Detection and Destroying System. (July 2014) S. Nagakishore Bhavanam, Acharya Nagarjuna the proposed paper describes that this project consists of an intelligent sonar based object tracking system and DC geared motor driven firing unit interfaced with microcontroller based control unit is used. Ultrasonic sensor is preferred instead of IR sensor, because the Ultrasonic sensors can cover large distances and it can detect target in all the lighting conditions (day or night). Atmel 89c52 microcontroller is used as a control unit. As the target (missile) is detected the control unit sends commands to firing unit to destroy the target. The programming of microcontroller is done using embedded 'c' language [3]. Missile Detection and Auto Destroy System on a Robot Platform. (2015) Ms. Palwe Pooja Balasaheb, Ms. Shinde Tejashree Anil, Ms. Sonawane Chaitali Shivajirao, Prof. S. M. Bhilegaonkar. This paper proposes a missile detection and auto destroy system on Robot Platform. A microcontroller ATmega16 for loading embedded C program. The ATmega16 is 40 pin IC which has four ports like port a, port B, port C and port D . . . AT mega16 is 8-bit microcontroller and it is

based on RISC architecture [4]. It works on 16MHz frequency. It has low power consumption and inbuilt analog to digital converter. This microcontroller executes powerful instruction in single clock cycle. Stepper motor and ultrasonic sensor are mounted hence sensor rotate continuously rotate in 360-degree direction. If any obstacle comes in between ultrasonic ray that time stepper motor will stop and Laser gun gets on. Sensor also measures the distance and it is displayed by using LCD display. Here Laser is used for destroying purpose as obstacle is detected [5]. Robotic Platform movement in all required direction it means forward, backward, left, right etc. for that RF transmitter for sending wireless data, RF receiver for receiving data and motor driver IC for movement of robot according to our input data [6]. Automatic Missile Detector Using Ultrasonic Proximity Detector. (April 2016) Narayan Thakkar, Shubham Sahu, Shrushti Sindhemeshram, Roshan Kumar. This proposed system uses 8051 Microcontroller as a central control system to send control command to targeting system to attack the target (missile) via laser. The Intel MCS-51 (commonly termed 8051) is an internally Harvard architecture, complex instruction set computing (CISC) instruction set, single chip microcontroller series developed by Intel in 1980 for use in embedded systems. power supply is very important for any circuit, so the ripples present are removed using a capacitive filter and it is then regulated to +5V using a voltage regulator 7805 which is required for the proper operation of the microcontroller and other components[7]. In this project a robotic platform along with a stepper motor fitted with ultrasonic sensor is used to automatically locate and aim at a stationary

target, moving target and firing a laser. It is Light Amplification by Stimulated Emission of Radiation[8]. Target acquisition and tracking are frequent domains of active sensing such as Ultra-sound, and then LASER firing. The ability to track targets at manipulation range can significantly reduce the cost and complexity of manipulator control. This research has an additional advantage that it checks the target is hostile or not and accordingly fires the laser [9]. A RF transmitter and receiver modules are used for controlling robotic platform RF Transmitter is use for transmit the wireless data from input side. It operates at 434MHz frequency. For communication purpose we need serial data so we use Encoder HT12E, it converts parallel data into serial form at transmitter side. And at receiver side decoder HT12D converts that serial data in to parallel form [6]. Definition: - A ground Missile is a missile designed to be launched from the ground to destroy aircraft or other missiles [10].

3. EXISTING SYSTEM

In the existing system missile tracking and detection happens through manual mode of operation. If any enemies found the information send to department with delay due to that this system have limitation. In this proposed system we integrated IOT web module it automatically sends data into server for high security this system also have manually decision based firing system.

4. PROPOSED SYSTEM

This is the block diagram of Missile Tracking and Auto Alert over IOT. In this the Ultra sonic

sensor is used HC-SR04 which is used to detect the obstacle and measures the distance of a target object by emitting the ultrasonic waves and converts the sound into electrical signal and switch is used to trigger the laser light and it is manually controlled.

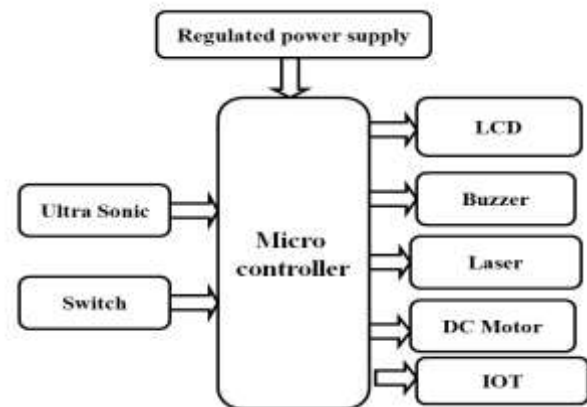


Fig.1. Proposed block diagram

WORKING MODEL:

Micro controller Arduino it collects the input from the ultrasonic sensor and switch by using it controls the output. The Buzzer is used to alert the people that there is an obstacle detected and Laser is light which is used to identify the obstacle and it can be operated by the switch. When the obstacle is detected in the LCD we can see the distance of the detected obstacle. A DC motor is an electrical machine that converts electrical energy into mechanical energy. In this the input is electrical energy is the direct current which is transformed into the mechanical rotation. So, by using the L293D module the DC motor is used to rotate clock wise and anti-clock wise. Here, the IOT is the technology this is used to connect the things with the internet around the world by this the information we have detected can be stored in the site and we can check this any time from anywhere in the

world by using the particular website. The regulated power supply converts the 230v AC into 5/12v DC current and supplied to all the modules in the circuit. The inputs are ultrasonic sensor and switch is given to Arduino then it processes the output in the form of buzzer, LCD, Laser and IoT.

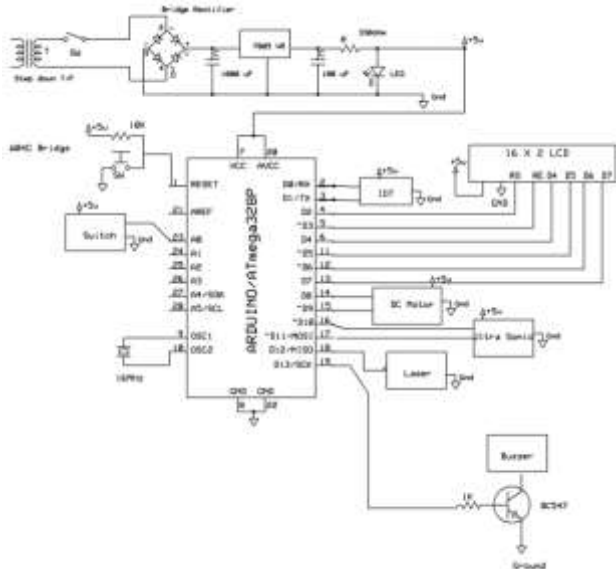


Fig.2. Proposed Circuit diagram

Hardware modules are interconnected to each other. IOT module is connected to D1 pin. LCD module is connected to D2, D3, D4, D5, D6, D7 pins. DC motor is connected to D8 and D9 pins which helps to rotate clock wise and anti-clock wise. Ultrasonic sensor is connected to D10, D11 pins. Laser is connected to D12 pin. Buzzer is connected to D13 pin. The Arduino we have used in this is ATmega328P controller which is simple and low-cost micro controlled.

5. RESULTS

When the Ultrasonic sensor detects the obstacle the input is given to the Arduino Microcontroller then it process and in LCD we can see the distance of the obstacle detected and in LCD “U” represents the updating the

information in server and this is done by technology called IOT and this information is visible anywhere in the world. Laser is to point the obstacle and also it is used for firing the obstacle this laser is operated by using switch. And the buzzer is also on to indicate the people around there. Like this it is done.



Fig.3. Proposed Output model



Fig.4. LCD Output Level Indication

Regulated power supply is used to convert the 230v AC to 5/12v DC. The Capacitors C1, C2. C1 is used to reduce the noise in RPS and C2 is used to reduce the noise in the Voltage

Regulator. The LED is on to indicate the power supply and the power is supplied to all the modules.



Fig.5. Missile rangeLevel Indication

The output is shown in buzzer, LCD, Laser and IOT (web page). At first the buzzer is a sound to indicate the people around there. LCD is to display the distance of the obstacle detected. Laser is to point the obstacle and it is controlled by the switch.

Finally, IOT means by using internet of things we the connect the things around the world and when the obstacle is detected the information is updated to the webpage to that we have created a website. Firstly, login to the website, by that we can see the table consists of distance of the obstacle and the time and date. We have another option by clicking the Switch to Graph View we can see the graph.

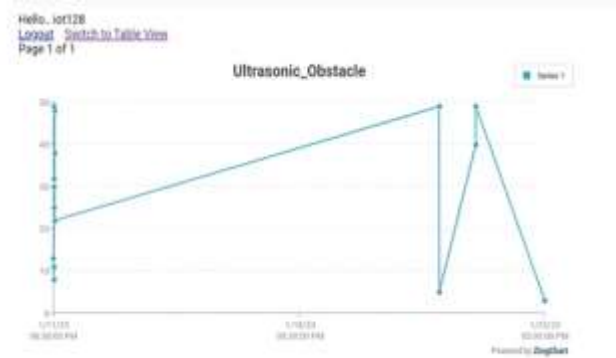


Fig.5. Output Ultrasonic Range Tracking

Table.1 Results comparison Table

Parameter	Existing Model	Proposed Model
Microcontroller	PIC	Arduino
Speed	Low	High
Complexity	High	Low
Efficiency	LOW	HIGH
Sensors used	IR,GSM	Ultrasonic, IOT

6. CONCLUSION

The project “Missile tracking and auto collision system” was designed such that the design and construct automatic missile detection and destroying system. This system is designed to detect the target (missile) moving in multiple directions. The target destroying system moves automatically in the direction of missile and fires it upon fixing the target. In this project missile detection And auto alert system we implemented using ultrasonic sensor which is rotate clockwise and anti clockwise directions repeatedly. In this both directions if we find any object in this way then buzzer automatically alerts and if press on switch laser gun fires the



object automatically and object range will be displays on LCD and IOT server for security.

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