

Automated Missile Detection And Destroy System Using Arduino UNO

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Abstract: This major project involves the complete system design and construction of a Missile detector and destroys system. We aimed to develop a compact and highly mobile defense system that allows operational flexibility. The system can autonomously track and shoot at moving targets, while also allowing a user to remotely access and control the gun. The mobility, hardiness, and functionality of this system allows a reliable replacement for human beings in harsh and hostile environments; ultimately sparing a life.

Keywords: Destroy System, Missile Detector, Ultrasonic sensor, IR sensor

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 camera with image sensors by this 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 a Camera and a DC geared motor driven firing unit interfaced with a Microcontroller based control unit. We prefer Camera, because the Camera covers larger area and it can detect the target in all conditions. The programming of Microcontroller is done using Embedded „C“.

LITERATURE SURVEY

Missile Detection by Ultrasonic and Auto Destroy System. (May 2014). Samir Chopra, Suman Bharti, Tarun Singh Negi, Prof. P.D

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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. 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 destroys 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 port like port A, port B, port C and port D. .AT mega16 is 8-bit microcontroller and it is based on RISC architecture. 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 come in between ultrasonic ray that time stepper motor will stop and Laser gun gets on. Sensor also measure the distance and it is displayed by using LCD display. Here Laser is used for destroying purpose as obstacle is detected. 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 [4].

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. 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. 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 fire the laser. 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].

MISSILE DETECTOR AND DESTROY SYSTEM

Definition: - A ground Missile is a missile designed to be launched from the ground to destroy aircraft or other missiles. It is one type of anti-aircraft system; in modern armed forces missiles have replaced most other forms of dedicated anti-aircraft weapons, with anti-aircraft guns pushed into specialized roles. The first serious attempts at SAM development took place during World War II, although no operational systems were introduced. Further development through the 1940s and 50s led to the first operational systems being introduced by most major forces during the second half of the 1950s. Smaller systems, suitable for close-range work, evolved through the 1960s and 70s, to modern systems that are man-portable. Ship borne systems followed the evolution of land-based models, starting with long-range weapons and steadily evolving toward smaller designs to provide a layered defense that have pushed gun-based systems into the shortest-range roles.

EXISTING METHOD

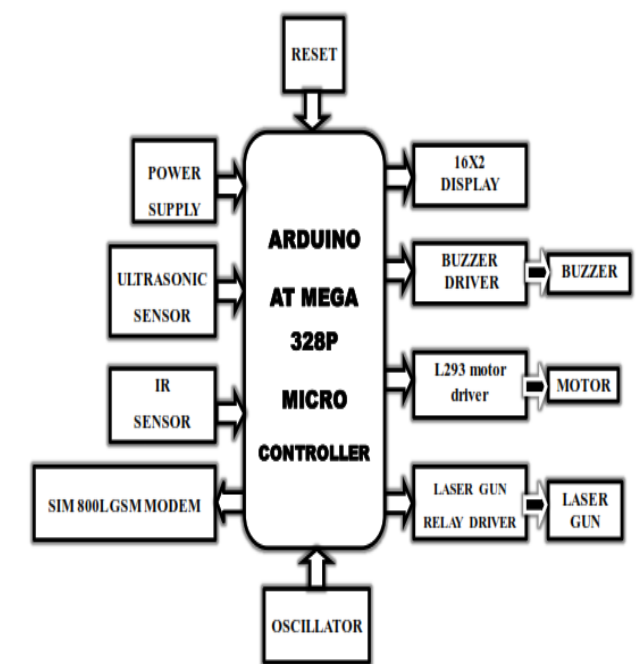
In the existing method the target can be detected and after detection the controller will send the information to the controller. The controller needs to take certain action about the target. In other methods cameras are used to detect the target. Sensors and Cameras are used to detect obstacles only. In existing method, for communication purpose ZigBee, Bluetooth are used. Once the sensor or cameras detect target they starts shooting process to destroy the target whatever there is. After the controller passes the

information through communication device which is interfaced with user.

PROPOSED METHOD

This proposed system uses a fully automated system and due to this valuable time can be saved. The Ultrasonic sensor and IR sensors are used to detect the target. Here the controller is interfaced with sensors and it will be detected in 180 degrees and keeps on sending the signal to the controller. When object is detected the launching, machine will turn towards the degree of detected target and shoots. By using IR sensors it detects both living things and obstacles. If the living things i.e., birds are detected by IR sensor the controller aborts the shooting process. It only shoots obstacles. For communication purpose we use GSM for mobile communication.

BLOCK DIAGRAM



ARDUINO UNO: - It refers to control the all system. It is mostly used. It has low cost and high availability. The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The power source is selected automatically.

BUZZER:

A buzzer or beeper is a signalling and alerting device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows.

LASER:

The term LASER is originated as an acronym for Light Amplification by Stimulated Emission of Radiation. Any device that emit highly amplified and coherent radiation of one or more discrete frequencies. LASER delivers light in an almost-perfectly parallel beam (collimated) that is very pure, approaching a single wavelength. Well basically it is used to produce a coherent non dispersing beam of light by multiple refractions inside a highly polished glass cavity.

LIQUID CRYSTAL DISPLAY:

Liquid Crystal Display also called as LCD is very helpful in providing user interface as well as for debugging purpose. A liquid crystal display (LCD) is a flat panel display that uses

the light modulating properties of liquid crystals (LCs). LCD Modules can present textual information to user. The 2x16 character LCD interface card with supports both modes 4-bit and 8-bit interface, and also facility to adjust contrast through trim pot. In 4-bit interface 7 lines needed to create 4-bit interface; 4 data bits (D0 – D3), three control lines, address bit (RS), read/write bit (R/W) and control signal (E).

Relay

All relays contain a sensing unit, the electric coil, which is powered by AC or DC current. When the applied current or voltage exceeds a threshold value, the coil activates the armature, which operates either to close the open contacts or to open the closed magnetic force that actuates the switch mechanism. The magnetic force is, in effects, relaying the action from one circuit to another. The first circuit is called the control circuit; the second is called the load circuit.

ULTRASONIC SENSOR

Ultrasonic Rangefinder is used to find range of an obstacle from the sensor. It works on a principle similar to RADAR or SONAR which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively.

IR SENSOR:

it provides a detection range of 10- 30 cm. This sensor can be used for most indoor applications where no important ambient light is present. It is the same principle in ALL Infra-Red proximity sensors. The basic idea is to send infra red light

through IR-LEDs, which is then reflected by any object in front of the sensor.

L293D Motor Driver

A motor driver is an integrated circuit chip which is usually used to control motors in autonomous robots. Motor driver act as an interface between Arduino and the motors . The most commonly used motor driver IC's are from the L293 series such as L293D, L293NE, etc. These ICs are designed to control 2 DC motors simultaneously. L293D consist of two H-bridge. H-bridge is the simplest circuit for controlling a low current rated motor. We will be referring the motor driver IC as L293D only. L293D has 16 pins.

GSM SIM_800L:

SIM800L is a complete Quad-band GSM/GPRS solution in a LGA type which can be embedded in the customer applications. SIM800L support Quad-band 850/900/1800/1900MHz, it can transmit Voice, SMS and data information with low power consumption.

ARDUINO IDE SOFTWARE:

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuino hardware to upload programs and communicate with them.

CONCLUSION

The Ultrasonic transceiver (Transmitter & Receiver) detects missile object and displays distance on LCD through Microcontroller based GSM wireless communication standard. The sensor is fitted on antenna and is rotated and controlled by stepper motor through 360 degrees and also with up and down directions. If there is any target within the detection range, the application will turn the launcher to the nearest detected target and fires. If the target is living thing that is sensed by IR sensor it aborts the shooting process and transmits the information to user through GSM for mobile communication.

FUTURE SCOPE

1. By using controller microcontroller we can implement the intelligent system in future.
2. In Future it can be used as an advanced tracking system along with high intensity camera to track a real target(say a Missile or Tank).
3. The advantage of this unit is that to run the system we can use video camera and other sensors to see the live moving target from anywhere in the world.

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