

Automatic Enemy Detecting Defense Robot by using Face Detection Technique

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Article Received: 29 January 2018

Article Accepted: 26 February 2018

Article Published: 18 April 2018

ABSTRACT

In this project we are going to design an automatic defence robot with enemy (human) detection using face detection technique by blending in the power of Arduino and Android. the mobile camera will move along with enemy face with the help of servos. The advantage of using the Android Mobile Phone here is that you do not need to invest on a camera module and the whole image detection work can be done in the phone itself; you do not need your Arduino connected to your computer for this to work. Here we have used Bluetooth Module with Arduino to communicate with Mobile wirelessly. A land mine is an explosive device concealed under or on the ground and designed to destroy or disable enemy targets, ranging from combatants to vehicles and tanks, as they pass over or near it. Such a device is typically detonated automatically by way of pressure when a target steps on it or drives over it, although other detonation mechanisms are used. A land mine may cause damage by direct blast effect, by fragments that are thrown by the blast, or by both. The name originates from the ancient practice of military mining, where tunnels were dug under enemy fortifications or troop formations.

Keywords: Arduino, Mobile app.

1. INTRODUCTION

An embedded system is a computer system designed for specific control functions within a larger system, often with real-time computing constraints. It is embedded as part of a complete device often including hardware and mechanical parts. By contrast, a general-purpose computer, such as a personal computer, is designed to be flexible and to meet a wide range of end-user needs. Embedded systems control many devices in common use today. A processor is an important unit in the embedded system hardware. It is the heart of the embedded system. Real time Image/Video processing becomes a challenging task because it is highly environment dependent. The illumination of light highly affects the processing. Lack of proper lighting condition, focusing on mobile subjects, interferences in signals causes presence of various type of noise in the image which makes processing not only difficult but also slower. Presence of complex background makes segmentation, a tiresome task for computation. A Computer having high processing speed is preferable for this purpose. However, now-a- days many stand-alone development boards like Beagle Board, ARM9, ARM11 are available which is compatible for porting Image processing projects on it and make portable Image Processing projects. These boards are much cheaper than our personal computer but a lot of hands-on exercises are need to be performed to have a deep knowledge about its architecture and functioning before switching to build Image Processing applications on it. In our project, we have considered our Personal Computer as our Processing device and we have developed all our applications which are compatible to Intel core2duo processor.

2. LITERATURE SURVEY

There has been many research works in paper by M.Sathishkumar, S.Rajini: Smart Surveillance System Using PIR Sensor Network Surveillance is most important security systems in home, industrial, office and public places. In this security system is based on the embedded system along with GSM and sensor networks. The human movement is detected using the PIR sensors. In this time, the system triggers an alarm detecting the presence of person in a

specific interval of time and simultaneously sends the how many persons are intruder via message to the SMS through GSM Modem. When the security system is activated, the CCTV camera is activated. This highly reactive approach has low computational requirement. Therefore it is well suited for home surveillance system. This surveillance security system implemented using PIC micro controller, camera, GSM and sensors. Home/office security systems have grown in popularity in recent years, a home/office owner's look for ways to protect their personal space and enhance their home values.

In paper by P.Surendrakumar, S.Geethapriyanka, V.Venkatash: Video Surveillance Robot with Multi Mode Operation describes the implementation of the wireless robot control system for monitoring purposes. Over the past decade, we have seen increased levels of investment in autonomous vehicles for surveillance and security used. On the domestic side, the robots are only used to detect human movement in the region and store it in the database to record, but on the side of the defence, the robots are used to detect the movement and directly send to the control room and capturing the person on the field. Robots can be used because they can work in places where a human being would be in danger.

3. EXISTING SYSTEM

A tracked crawler robot using body heat detection and a purpose built analogue tracking circuit is designed in this work. The infrared detection module consists of a single dual element Pyroelectric infra-red sensor. The drive and steering control system is designed using a single chip 74HCXX Quad 2-input NAND gate as the logic controller and providing constant forward propulsion whilst in real time adjusting to the subject's direction. Automatic tracking of animal or human subjects is the sole purpose of the design. The range has been limited to two meters, with a maximum range of five meters. The design is able to be utilized using a microprocessor or as a highly responsive analogue unit making it both adaptive and flexible.

The most common areas of research are based on the various computer based vision methods for human tracking to detect the possible shape of body, filter the noise, get the features of the face and compare against a database to identify the object. However there are many disadvantages for computer vision based human tracking methods being the problem of mass image data storage, heavy computational loads, cost of required cameras and the need for verbose and complicated algorithms to reduce the noise, extract relevant features and to follow or track the subject.

4. PROPOSED SYSTEM

In this project we are going to design an automatic defence robot with enemy (human) detection using face detection technique by blending in the power of Arduino and Android. In this project, the mobile camera will move along with enemy face with the help of servos. Here we have used Bluetooth module with Arduino communicates with wirelessly. A land mine is an explosive device concealed under or on the ground and designed to destroy or disable enemy targets, ranging from combatants to vehicles and tanks, as they pass over or near it. Such a device is

typically detonated automatically by way of pressure when a target steps on it or drives over it, although other detonation mechanisms are used. A land mine may cause damage by direct blast effect, by fragments that are thrown by the blast or by both.

4.1. Block Diagram

The following are the components of the block diagram, Bluetooth, Laser, Metal detector, Robot motor control, Servo control, Power supply.

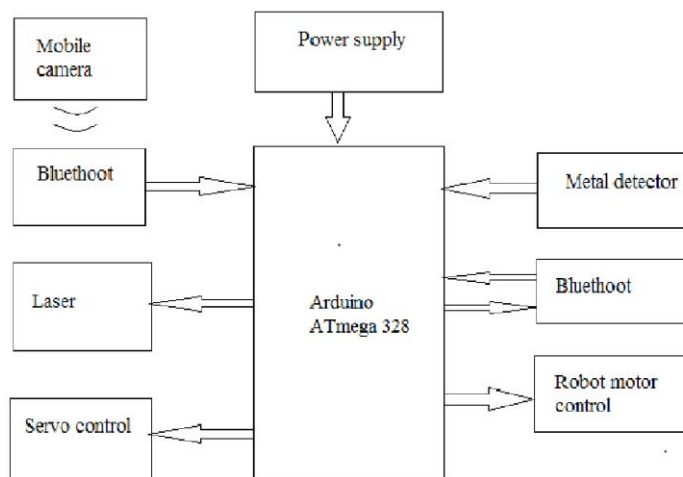


Fig.1 Block Diagram

Power supply is used to convert Ac to Dc supply. It is given to all the components. Face detection is used to detect by using Android Application. Android Application is used to analysis the face position. The face is assigned in center position and camera will be captured the face position. The face position is transmitted into the Atmega 328 controller through Bluetooth module.

The servo arm controller is assigned the face it with the help of gun target position .The face position will be move and also move in servo arm controller, then servo arm controller is used to with the help of fix it in the gun target. The gun target position will be fixed and the laser will be activated. Therefore, the overall command in mobile phone , if your command will be start and robot is start, and if your command will be stop and robot is stop.

4.2. Circuit Diagram

The Circuit Consists of two Servo motors, out of which one is used to move the mobile phone left/right and the other is used to tilt the mobile phone up/down. Ever wanted to build a Face Tracking Robotic Arm or Robot by simply using Arduino and not any other programming like Open CV, visual basics then read along, in this project we are going to implement face detection by blending in the power of Arduino.

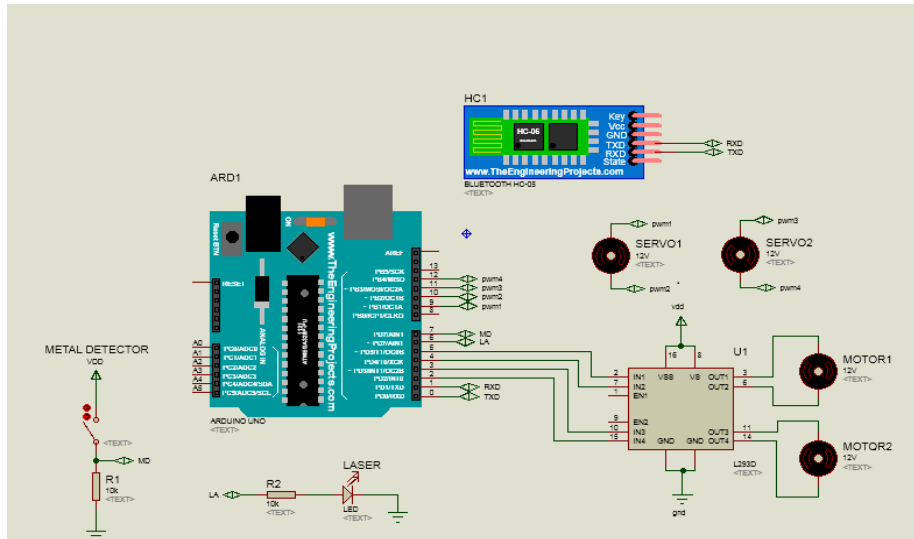


Fig 2. Circuit Diagram



Fig 3. Face Detection

4.3. Working

Once we are ready with our hardware, code and Android Application its time for some action. Simply power your Arduino and open the android application.

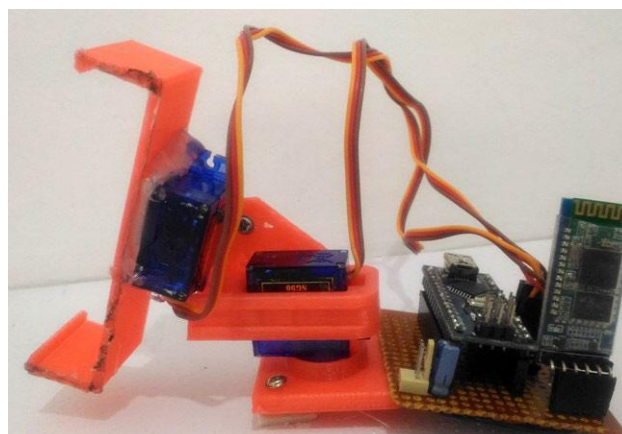


Fig 4. Working Process

The Application will automatically connect to the HC-05 (must be named HC-05) Bluetooth module and will wait for a face to be detected. Simply place the phone in our mobile holder and sit in front of it. You should notice your servo motors moving your phone so that your face will be placed at the centre of the screen. Now move around within the range of the camera and your mobile phone will follow your movements.

5. RESULT AND DISCUSSION

In this project, the mobile camera will move along with your face with the help of servos. The advantage of using the Android Mobile Phone here is that you do not need to invest on a camera module and the whole image detection work can be done in the phone itself, you do not need your Arduino connected to your computer for this to work. Here we have used Bluetooth Module with Arduino to communicate with Mobile wirelessly.



Fig 5. Face Detection

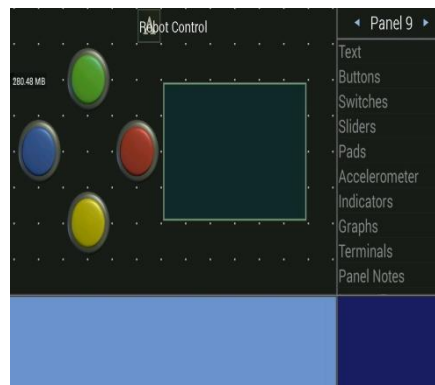


Fig 6. Robot Control



Fig 7. Robot Hardware

6. CONCLUSION

In this Project has described overall design for wheel robot for human detection of face detection technique by arduino and android. The enemy face detect with the help of servos will move mobile camera. Using the Android Mobile Phone here is that you do not need to invest on a camera module and the whole image detection has Bluetooth module; here we have used Bluetooth Module with Arduino to communicate with Mobile wirelessly. A land mine may cause damage by direct blast effect, by fragments that are thrown by the blast, or by both. The name originates from the ancient practice of military mining, where tunnels were dug under enemy fortifications or troop formations. . The Robot is equipped with a camera for monitoring the condition of the robot. The Wheeled robot expensive, robot and it is a helpful tool in for military for surveying and monitoring purpose. The robot is equipped with a robotic arm for the diffusion purpose.

ACKNOWLEDGEMENT

This work was supported in part by Department of Science & Technology (DST), FIST Program at Francis Xavier Engineering College, Tirunelveli, Tamilnadu, India.

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