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SURVEILLANCE ROBOT USING WIFI CAMERA

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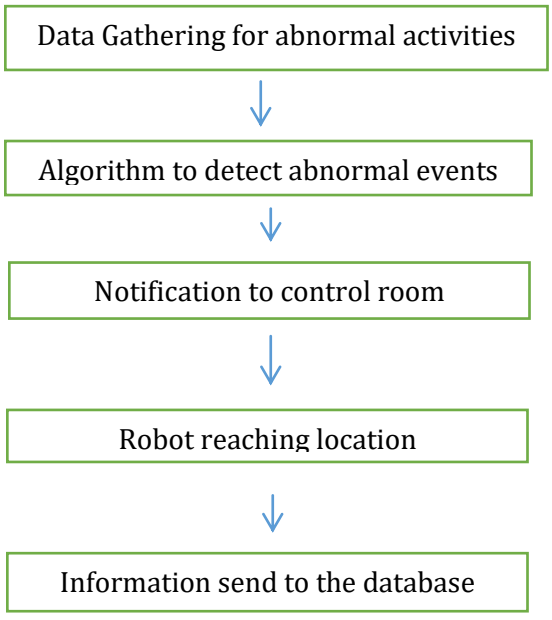
ABSTRACT
The undertaking is designed to increase for wi-fi patrolling for ladies and kids safety. The robot car the usage of android software for far flung and Autonomous operation connected with GSM and movement detector at the side of wi-fi digital digicam for tracking purpose. The robotic at the side of digital digicam can wirelessly transmit actual time video and GSM will ship movement alert.

KEYWORDS:
Arduino Microcontroller, Digicam

INTRODUCTION

Technology has added a dynamic and great alternate in robotics and automation discipline which stages in all sorts of regions. Surveillance is the technique of near systematic commentary or supervision maintained over a person, group, etc. specially one in custody or below suspicion. Thus surveillance is particularly required withinside the regions which includes border regions, public places, workplaces and in industries. It is particularly used for tracking sports. The act of surveillance may be finished each indoor in addition to in out of doors regions with the aid of using human beings or with the assist of embedded structures which includes robots and different automation devices. A robotic is not anything however an automated digital gadget this is able to acting programmed sports accordingly changing human work, offering surprisingly correct effects and effortlessly overcoming the restrictions of human beings. Thus changing human beings withinside the surveillance fields is one of the super development in robotics

I. Proposed System Architecture



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Analyzing the data for future

II . System Design

Requirements for making the system:-

a.)ARDUINO MICROCONTROLLER:

Arduino microcontroller is primarily based totally on UNO AtMega328. It is used to get hold of instructions despatched with the aid of using the person thru the net and strategies in step with the code and extensively utilized to govern the motors. Wi-Fi module ESP8266 is likewise linked with the arduino in order that Wi-Fi facility may be supplied to the robot.

b.)DC MOTORS:

Motors that operate on 12V DC power supply are used. These are rotary electrical machine that converts direct current electrical energy into mechanical energy. The motors used are of 30 rpm speed of operation.

c.)ULTRASONIC SENSOR:

Ultrasonic sensor is a tool which could degree the gap to an object (obstacle) via way of means of the use of sound waves at a specific frequency. It offers a 3cm to 3m range. It can paintings in any lights conditions. Thus the robotic effortlessly dodges limitations gift on its way.

d.)PIR SENSOR:

An passive infrared sensor is used to feel and decide the character and factors of the environment through emitting infrared radiation. This sensor has the cap potential to emit infrared radiation and detects the meditated radiation this is being meditated through an item or the environment. The variety is among a hundred and eighty diploma 2 cm to a few meter and the working voltage is round 3v to 5v. This PIR sensor is hooked up to the robotic to hit upon edges gift on its path.

e.)Lithium ion Battery:

Two 6V batteries are connected in series to provide a 12V power supply for the motors. From these batteries power supply is also given to the arduino and other parts that require power supply for their effective performance.

f.)WI-FI camera:

The ESP32-CAM is a development board with an ESP32-S chip, an OV2640 camera, microSD card slot and several GPIOs to connect peripherals. In this guide, we'll take a look at the ESP32-CAM GPIOs and how to use them.

f.i.)GSM Module:

GSM (Groupe Spéciale Mobile, now named Global System for Mobile Communications) is a 2nd Generation cellular mobile system innovated in Europe by ETSI (European Telecommunications Standardization Institute). It is now a "family name" of a number of systems including 2.5G and 3G systems such as:

f.ii.)HC05 Blutooth:

It is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Serial port Bluetooth module is fully qualified Bluetooth V2. 0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband

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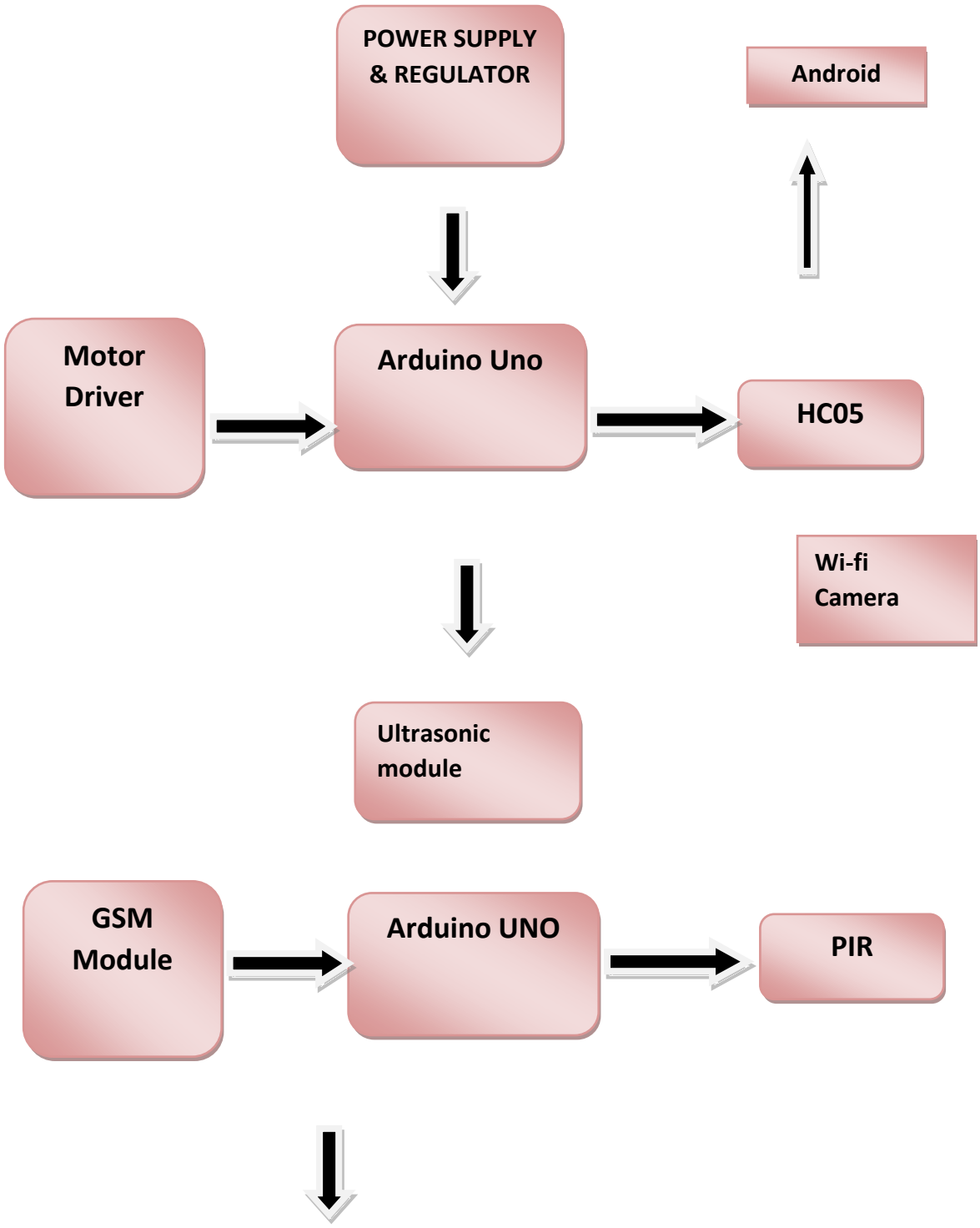
Block Diagram Of The System:



III. Algorithm Level Approach

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- *For intruder alert calling:*

```
#include <SoftwareSerial.h>
//Alarm reciever's phone number with country code
const String PHONE = "your number ";
//GSM Module RX pin to Arduino 3
//GSM Module TX pin to Arduino 2
#define rxPin 3
#define txPin 2
SoftwareSerial sim800(rxPin,txPin);
//the pin that the pir sensor is atteched to
int pir_sensor = 11;
void setup() {
 pinMode(pir_sensor, INPUT); // initialize sensor as an input
 digitalWrite(pir_sensor, 1);
 Serial.begin(115200); // initialize serial
 sim800.begin(9600);
 Serial.println("SIM800L software serial initialize");
 sim800.println("AT");
 delay(1000);
}
void loop(){
/////////////////////////////////////////////////
while(sim800.available()){
 Serial.println(sim800.readString());
}
/////////////////////////////////////////////////
while(Serial.available()) {
 sim800.println(Serial.readString());
}
/////////////////////////////////////////////////
 int val = digitalRead(pir_sensor); // read sensor value
 if (val == HIGH) { // check if the sensor is HIGH
 //state = HIGH;
```

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```
Serial.println("Motion detected!");
Serial.println("calling....");
delay(1000);
sim800.println("ATD"+PHONE+";");
delay(20000); //20 sec delay
}
}
```

- *For autonomous car and esp32 cam input*

```
#include <Servo.h> //Servo motor library. This is standard library
#include <NewPing.h> //Ultrasonic sensor function library. You
must install this library
//our L298N control pins
const int LeftMotorForward = 5;
const int LeftMotorBackward = 4;
const int RightMotorForward = 1;// cahnge 3-1
const int RightMotorBackward = 0;// cahnge 2-0
const int GPIO13 = 6;
const int GPIO14 = 7;
const int GPIO15 = 8;
const int GPIO02 = 9;
const int GPIO04 = 12;
//sensor pins
#define trig_pin A3 //analog input 1
#define echo_pin A2 //analog input 2
#define maximum_distance 200
boolean goesForward = false;
int distance = 100;
NewPing sonar(trig_pin, echo_pin, maximum_distance); //sensor
function
Servo servo_motor; //our servo namevoid setup() {
 pinMode(RightMotorForward, OUTPUT);
 pinMode(LeftMotorForward, OUTPUT);
```

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```
pinMode(LeftMotorBackward, OUTPUT);
pinMode(RightMotorBackward, OUTPUT);
pinMode(GPIO13, INPUT);
pinMode(GPIO14, INPUT);
pinMode(GPIO15, INPUT);
pinMode(GPIO02, INPUT);
pinMode(GPIO04, INPUT);
digitalWrite(GPIO04, LOW);
servo_motor.attach(11); //our servo pin
servo_motor.write(90);
delay(2000);
        delay(100);
}void loop() {
int activeButton = 0;
if (digitalRead(GPIO04) == 1){
activeButton = 1;
}
if (activeButton == 1) {
digitalWrite(RightMotorBackward, digitalRead(GPIO02));
digitalWrite(RightMotorForward, digitalRead(GPIO15));
digitalWrite(LeftMotorBackward, digitalRead(GPIO14));
digitalWrite(LeftMotorForward, digitalRead(GPIO13));
activeButton = 0;
}
else {
int distanceRight = 0;
int distanceLeft = 0;
delay(50);
if (distance <= 20) {
moveStop();
delay(300);
moveBackward();
delay(300);
```

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```
moveBackward();
delay(300);
moveBackward();
delay(400);
moveStop(); delay(300);
distanceRight = lookRight();
delay(300);
        if (distance >= distanceLeft) {
turnRight();
delay(300);
turnRight();
delay(300);
turnRight();
delay(300);
turnRight();
moveStop();
}
else {
turnLeft();
delay(300);
turnLeft();
delay(300);
turnLeft();
delay(300);
turnLeft();
moveStop();
}
}
        }
int lookRight() {
servo_motor.write(10);
        delay(500);
int distance = readPing();
```

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```
 delay(100);
 servo_motor.write(90);
return distance;
}
int lookLeft() {
 servo_motor.write(170);
 delay(500);
 int distance = readPing();
 delay(100);
 servo_motor.write(90);
 return distance;
 delay(100);
}
int readPing() {
 delay(70);
 int cm = sonar.ping_cm(); if (cm == 0) {
 cm = 250;
 }
 return cm;
}
void moveStop() {
 digitalWrite(RightMotorForward, LOW);
 digitalWrite(LeftMotorForward, LOW);
 digitalWrite(RightMotorBackward, LOW);
digitalWrite(LeftMotorBackward, LOW);
}
void moveForward() {
 if (!goesForward) {
 goesForward = true;
 digitalWrite(LeftMotorForward, HIGH);
 digitalWrite(RightMotorForward, HIGH);
 digitalWrite(LeftMotorBackward, LOW);
 digitalWrite(RightMotorBackward, LOW);
```

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```
 }
}void moveBackward() {
 goesForward = false;
 digitalWrite(LeftMotorBackward, HIGH);
 digitalWrite(RightMotorBackward, HIGH);
 digitalWrite(LeftMotorForward, LOW);
 digitalWrite(RightMotorForward, LOW);
 delay(500);
 digitalWrite(LeftMotorBackward, HIGH);
 digitalWrite(RightMotorBackward, HIGH);
 digitalWrite(LeftMotorForward, LOW);
 digitalWrite(RightMotorForward, LOW);}
void turnRight() {
 digitalWrite(LeftMotorForward, HIGH);
 digitalWrite(RightMotorBackward, HIGH);
 digitalWrite(LeftMotorBackward, LOW);
 digitalWrite(RightMotorForward, LOW);
 delay(500); digitalWrite(LeftMotorForward, HIGH);
 digitalWrite(RightMotorForward, HIGH);
 digitalWrite(LeftMotorBackward, LOW);
 digitalWrite(RightMotorBackward, LOW);
}
void turnLeft() {
 digitalWrite(LeftMotorBackward, HIGH);
 digitalWrite(RightMotorForward, HIGH);
 digitalWrite(LeftMotorForward, LOW);
 digitalWrite(RightMotorBackward, LOW);
 delay(500);
 digitalWrite(LeftMotorForward, HIGH);
 digitalWrite(RightMotorForward, HIGH);
 digitalWrite(LeftMotorBackward, LOW);
 digitalWrite(RightMotorBackward, LOW);
```

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RESULTS AND DISCUSSION

The essential manage unit of the Robotic device is the Arduino uno which has been programmed in C language. The consumer can manually manage the motion instructions of the robot wheel, and digital digicam. In addition, the consumer can alter the rotation angles of the robot, digital digicam and show the Real-time video with the aid of using the use of Graphical User Interface (GUI).

CONCLUSION

The robot surveillance may be very necessary, particularly in risky environments. The consequences of the preceding phase cause finish that the surveillance robotic is implemented successfully. A wonderful wi-fi communique among the consumer and robotic is achieved the use of Wi-Fi circuit. The use of servo motors in the robot wheel and camera enables them to transport with specific angles. An Arduino platform is used in place of others when you consider that it's far programmed via way of means of pc thru USB port and there's no want to an outside programmer tool this reduces the fee and saves the time.

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