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Agriculture Fire Monitoring Robot Using IOT

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ABSTRACT:-The objective of this project is to design a agriculture fire monitoring and tree theft detection using IOT. In this project we are going to monitor the forest safety. Commonly in a forest fire accidents frequently happen. Here we are going to monitor that fire accident with the help fire sensor. We are monitoring a entire forest area using moving robot model. The robot model included with Fire sensor output is given to the ARDUINO via SCU. SCU is signal conditioning unit. Fires sensor is used to find the Fire accident. The temperature sensor used to monitor the agriculture or forest temperature. The ultrasonic sensor is used to detect the human movement and animal movement. All sensors are included with robot model for entire agriculture area monitoring. Here we use flash type reprogrammable Arduino which we have already programmed. It receives the signals from both fire and vibration sensor, and transmits this signal to the mobile using IOT server.

I.INTRODUCTION

Present environment is increasingly shifting towards automation. Two principle components of today's automations are programmable controllers and robots. In order to aid the tedious work and to serve the mankind, today there is a general tendency to develop an intelligent operation. Arduino is the heart of the device which handles all the sub devices connected across it. It has flash type reprogrammable memory. C.Nagarajan et al [2,10] studies It has some peripheral devices to play this project perform. It also provides sufficient power to inbuilt peripheral devices. We need not give individually to all devices. The peripheral devices also activates as low power operation mode. These are the advantages are appear here. The concept of this research is to detect the fire in various locations to identify the forest fire accidents to monitor and prevent before attempting any forest fire on the location.

II.EXISTING SYSTEM

The existing system focusing on with the advancement in human technology the risk of natural and man induced catastrophes increased exponentially. One of most dangerous disaster is forest fire. The forest fire represents continuous threat to species of flora as well as fauna. This paper highlights the powerful feature of wireless sensors for forest fire detection. The sensor data is collected using Arduino development board and transmitted to base station wirelessly. Also an alert is send using GSM module.

III.PROPOSED SYSTEM

The working of proposed system is based on IOT to monitor agriculture land in real time. Here we are going to monitor that fire accident with the help fire sensor. Fire sensor output is given to the ARDUINO via SCU. SCU is signal conditioning unit. Initially the moving Robot monitoring an agriculture land using different sensors. The fire sensor is interfaced with robot to detect the fire and avoid chance of fire accident. The ultrasonic sensor is used find the animal crossing distance. It will come to close the signal passed. Fire sensor is used to avoid Fire accident and in case of fire detected the pump is activated. Here we use flash type reprogrammable Arduino which we have already programmed. It receives the signals from both fire and vibration sensor, and transmits this signal to the mobile using IOT Server. All these

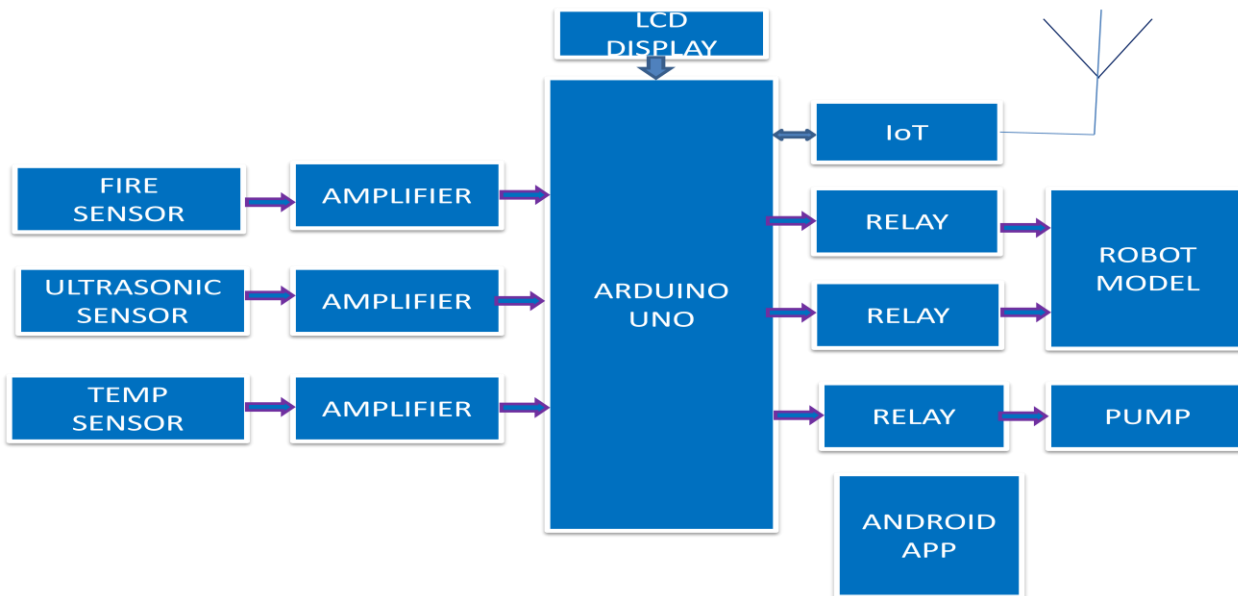
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sensor values are monitored by Controller and user can monitor the value using IOT server (WIFI). In case of fire or other emergency cases the emergency pump is activated for spraying water on fire accident area.



V.SOFTWARE REQUIREMENTS

- Arduino IDE
- Android studio



Fig 1 : ARDUINO UNO

Arduino Uno is a microcontroller board based on the ATmega328P (Fig:1). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, 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.



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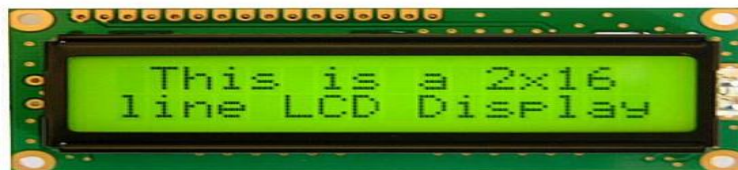


Fig 2 : LCD DISPLAY

A liquid crystal display (LCD) is a thin, flat electronic visual display that uses the light modulating properties of liquid crystals (Fig:2). They are used in a wide range of applications including: computer monitors, television, instrument panels, aircraft cockpit displays, signage, etc. They are common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones. LCDs have displaced cathode ray tube(CRT) displays in most applications.

4.3 ULTRASONIC SENSOR

Ultrasonic sensors work on a principle similar to radar or sonar which evaluate attributes of a target by interpreting the echoes from radio or sound waves respectively. Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object.

4.4 TEMPERATURE SENSOR

A thermistor is a type of resistor whose resistance varies with temperature. The word is a portmanteau of thermal and resistor. Thermistors are widely used as inrush current limiters, temperature sensors, self-resetting over current protectors, and self-regulating heating elements.

4.5 IR SENSOR

An Infrared sensor (IR sensor) is an electronic device that measures infrared (IR) light radiating from objects in its field of view. Apparent motion is detected when an infrared source with one temperature, such as a human, passes in front of an infrared source with another temperature, such as a wall. All objects emit what is known as black body radiation. It is usually infrared radiation that is invisible to the human eye but can be detected by electronic devices designed for such a purpose.

4.6 AMPLIFIER

An electronic amplifier is a device for increasing the power of a signal. It does this by taking energy from a power supply and controlling the output to match the input signal shape but with a larger amplitude. In this sense, an amplifier may be considered as modulating the output of the power supply

4.7 RELAY

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts(Fig:3). The coil current can be on or off so relays have two switch positions and they are double throw (changeover) switches.

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Fig 3 : RELAY

Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits; the link is magnetic and mechanical.

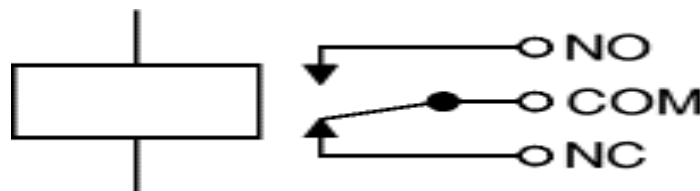


Fig 4 : Relay pins

The relay's switch connections are usually labeled COM, NC and NO(Fig:4):

4.9 INTERNET OF THINGS (IOT):

The Internet of things (IoT) is the network of physical devices, vehicles, home appliances, and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these things to connect, collect and exchange data. IoT involves extending Internet connectivity beyond standard devices, such as desktops, laptops, smart phones and tablets, to any range of traditionally dumb or non-internet-enabled physical devices and everyday objects(Fig:6). Embedded with technology, these devices can communicate and interact over the Internet, and they can be remotely monitored and controlled. With the arrival of driverless vehicles, a branch of IoT, i.e. the Internet of Vehicle starts to gain more attention.



Fig 6: IoT



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The definition of the Internet of things has evolved due to convergence of multiple technologies, real-time analytics, commodity sensors, and embedded systems.

VI.RESULTS AND DISCUSSION

The working of robot model is based on IOT to monitor agriculture land in real time. Here we are going to monitor that fire accident with the help fire sensor(Fig:7). Fire sensor output is given to the ARDUINO via SCU. SCU is signal conditioning unit. Initially the moving Robot monitoring an agriculture land using different sensors. The fire sensor is interfaced with robot to detect the fire and avoid chance of fire accident. The ultrasonic sensor is used find the animal crossing distance. It will come to close the signal passed. Fire sensor is used to avoid Fire accident and in case of fire detected the pump is activated. Here we use flash type reprogrammable Arduino which we have already programmed.

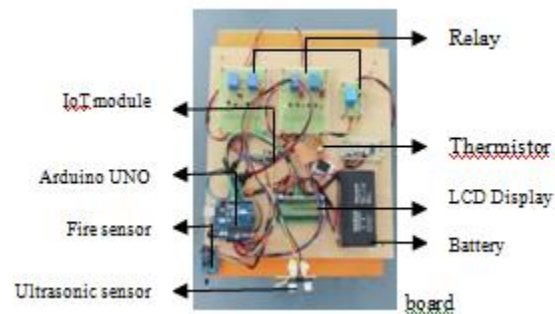


Fig 7:OUTPUT HARDWARE

It receives the signals from both fire and vibration sensor, and transmits this signal to the mobile using IOT Server. All these sensor values are monitored by Controller and user can monitor the value using IOT server (WIFI). In case of fire or emergency cases the emergency pump is activated for spraying water on fire accident area. If the sensor state is going emergency message sent to IOT server and Android app.

VII.CONCLUSION

In this effective way we are designing agriculture fire monitoring system using IOT based Technology. The progress in science & technology is a non-stop process. New things and new technology are being invented. As the technology grows day by day, we can imagine about the future in which thing we may occupy every place. The proposed system based on ARDUINO is found to be more compact, user friendly and less complex, which can readily be used in order to perform. The main feature of this project is we are monitoring Forest in Real time using IOT based Technology. IOT Server continuously monitoring forest and individual sensor status is updated in IOT server or android app. using this project we can monitor entire forest area to avoid Tree theft, fire accident to avoid deforestation.

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