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IoT Based Crop Fileds Monitoring & Alerting System for Prevention Tin Wild Animal Attacks Using Passive Infrared Sensor

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ABSTRACT:

Animal assaults that result in crop damage are one of the main factors that can lower agricultural production. Crop raiding is one of the conflicts that is most abrasive human-wildlife relationships because cultivated land has been encroached into formerly uninhabited areas. Human population growth and the need for wildlife intersect, costing locals and agricultural land. Wild animals regularly damage standing crops, reducing crop production annually and costing farmers money. With the low productivity of farms today, farmer suicide is a major issue. The destruction of crops by wild animals and by natural objects are the two main causes of this low output. The Internet of Things is the expansion of the Internet for the future generation, where a network of physical devices is joined with other types of things, such sensors, and they exchange data via being connected to the Internet. IOT offers many benefits, is effective, and has significantly changed many facets of how we live. Aiming towards a smarter, more advanced world, it is a completely integrated network that has strong data collection and analytical capabilities. The construction of an Internet of Things application for crop protection to stop animal invasions in the crop field is demonstrated in this project. To avoid potential harm from wild animal attacks on agriculture, a repelling and monitoring system is offered. It also provides alerts via IoT. (Internet of Things).

1. INTRODUCTION:

Agriculture workers and farmers all around the world struggle with protecting their crops against animal attacks. Deer, rabbits, birds, and rats are just a few examples of the wildlife that may seriously harm crops, reducing yields and costing farmers money. Farmers have historically utilised a variety of techniques to solve this problem, including fences, fright strategies, and repellents to stop animal attacks. These techniques can be labour- and money-intensive, and they might not always be effective. In recent years, there has been an increase in interest in employing new technologies, such as the Internet of Things (IoT), to create crop protection strategies that are more effective and efficient. Using passive infrared sensors to keep an eye out for animal activity in agriculture fields is one such method. Because of the real-time monitoring and detection of animal activity made possible by this technology, farmers can act quickly to avoid or reduce crop damage. IoT technology can greatly enhance crop security, lower financial losses for farmers, and lessen the negative environmental effects of conventional techniques like chemical repellents.

2. SYSTEM SPECIFICATION

Things. An item is a "thing" if it has actuators, which enable things to act, and sensors, which collect data to be transferred across a network (for example, to switch on or off the light, to open or close a door, to increase or decrease engine rotation speed and more). This idea incorporates refrigerators, street lamps, structures, automobiles, production machines, medical equipment, and everything else that can be imagined. In other circumstances, sensors are not physically attached to the objects they are monitoring; instead, they may need to keep an eye on, for instance, what is happening in the environment that is closest to the object.

ML models produced via machine learning. Models for control applications can be developed using machine learning to be more accurate and effective. Based on the historical data gathered in a big data warehouse, models are updated often (for instance, once per week or once per month). New models are employed by control applications after being validated for applicability and effectiveness by data analysts and receiving their approval.

2.1 HARDWARE CONFIGURATION

➢ SENSORS: PIR SENSOR

➢ SIREN

➢ LC DISPLAY

➢ FLASH LIGHT

2.1.1 PIR SENSOR

Motion can be sensed using PIR sensors, which are typically always employed to determine if a person has entered or exited the sensor's detection area. They do not deteriorate over time and are lightweight, affordable, low-power, and tiny. They are frequently found in devices and equipment used in homes and workplaces as a result. These sensors are also known as PIR, pyroelectric, passive infrared, or IR motion sensors. PIR sensors are ideal for a lot of simple projects or items that need to know when a person has left, entered, or is approaching. They have a wide lens range, need little power and money, are quite robust, and are simple to interface with. Keep in mind that PIRs cannot tell you how many people are nearby or how close they are to the sensor, that the lens is frequently fixed to a specific sweep and distance (although it is possible to hack it), and that house pets can occasionally cause them to go off

There are two slots in the PIR sensor itself, and each slot is made of a unique substance that is IR-sensitive. Although the lens being utilised here is not really doing much, we may observe that the two slots can 'see' beyond a certain distance (basically the sensitivity of the sensor). While the sensor is not in use, both slots pick up the same amount of infrared light—the ambient level—radiated by the room, the walls, or the outside. One half of the PIR sensor is first intercepted by a warm body, such as a person or animal, which results in a positive differential change between the two halves. The opposite occurs when the warm body departs the sensing area, and the sensor produces a negative differential change. These change pulses are what is detected.

2.1.2 SIREN

DC 12V Wired Mini Horn Siren Home Security Sound Alarm System 110DB Anti-theft Speaker Buzzer. This product can be used with your system to respond to signals from the alarm keypad/console.
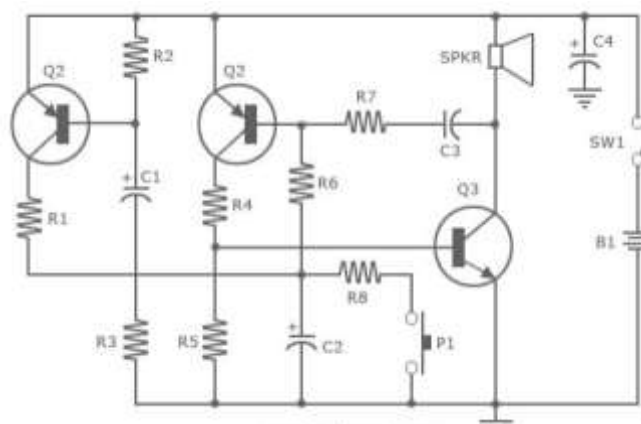
A complementary transistor pair (BC 557 & 337) is arranged as an oscillator, directly drives the speaker. Transistor Q1 (BC 557) is used to provide full charging of capacitor C2. When the push button switch P1 is pressed, capacitor C2 discharges through R8 and the circuit starts oscillating at a low frequency that increases slowly until a high-frequency steady tone is reached and it is kept. When P1 is released C2 starts discharging and output frequency slowly decreases. When C2 is charged fully the circuit stops oscillations.

2.1.3 FLASH LIGHT

When animals are attacking crops, using flashlights to safeguard the crops can be useful. Bright lights can scare away animals like deer, raccoons, and other types of wildlife. Farmers whose crops are susceptible to nighttime animal assaults may find this strategy to be very helpful. One strategy is to position a circle of flashlights as a perimeter around the place you want to secure. Animals might find it challenging to access the crops because of the light barrier that may result from this. You could also set up motion-activated lights that turn on when animals approach.

2.1.4 LIQUID CRYSTAL DISPLAY (LCD)

Materials used in liquid crystal displays (LCDs) contain characteristics of both liquids and crystals. Instead of a melting point, they have a range of temperatures where the molecules are practically as mobile as they would be in a liquid yet are arranged in a structure akin to a crystal. The liquid crystal material is sandwiched between two glass panels that make up an LCD. Transparent electrodes that define the characters, symbols, or patterns to be displayed are deposited on the inner surface of the glass plates. Polymeric layers are present between the electrodes and the liquid crystal, causing the liquid crystal molecules to preserve a specific orientation angle.

As the LCD doesn't produce its own light, light is required to read the panel. Reading in the dark is made feasible by the use of backlighting. The LCDs have a long lifespan and a broad temperature range of operation. The LCDs are more user-friendly because it is relatively easy to change the layout or display size.

Crystalonics dot–matrix (alphanumeric) liquid crystal displays are available in TN, STN types, with or without backlight. The use of C-MOS LCD controller and driver ICs result in low power consumption. These modules can be interfaced with a 4-bit or 8-bit microprocessor /Micro controller.
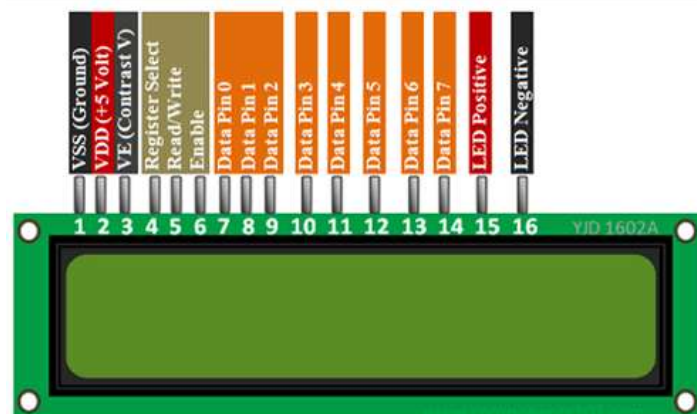
3. SYSTEM STUDY:

3.1 EXISTING SYSTEM:

The old version requirement in low power. Circuit simulation has typically not involved any interactive elements. Net lists were initially created manually, and the outcome was reams of numbers. If you were fortunate, you received a pseudo-graphical output with asterisks drawn to represent the voltage and current waveforms. In more recent times, schematic capture and on-screen graphing have become commonplace, but the simulation process is still not interactive; you create the circuit, press Go, and then review the outcomes in some sort of post processing. This is acceptable if the circuit you are testing exhibits essentially static behaviour, such as an oscillator that simply sits there and oscillates happily at 1 MHz. The required setup, however, becomes extremely difficult and one must turn to a real prototype if you are constructing a burglar alarm and want to know what happens when a would-be burglar enters the incorrect PIN into the keypad. This is unfortunate because productivity-wise, working "in cyberspace" has so much to offer in the design industry.

Only in educational circles has an attempt been made to present circuit simulation like real life electronics where it is possible to interact with the circuit whilst it is being simulated. The problem here has been that the animated component models have been hard coded into the program. Only limited numbers of simple devices such as switches, light bulbs, electric motors etc. have been offered, and these are of little use to the professional user. In addition, the quality of circuit simulation has often left much to be desired. For example, one major product of this type has no timing information within its digital models.

3.1.1 DRAWBACKS

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- System and strong rains cause system damage.
- Remote area network problems. o Animals may harm your system.
- development and maintenance costs are high.

3.2 PROPOSED SYSTEM:

The information in this manual is meant to supplement that in the context-sensitive help. The help section offers context-sensitive information on certain icons, commands, and dialogue forms, whilst the manual comprises background information and training. The majority of user interface components can be accessed with help by pointing with the mouse and hitting F1. The format of the manual reflects the fact that PROTEUS VSM can be used in one of two quite distinct ways: either for interactive simulation or for graph-based simulation. Typically, you will use interactive simulation to see if a design works at all, and graphsbased simulation to investigate why it doesn't or to take very detailed measurements. However, there are no hard and fast rules. Some elements of the system, such as *Generators* are relevant to both modes of use and are given their own chapters for this reason. Detailed, step by step tutorials are provided which take you through both types of simulation exercise. We strongly recommend that you work through these as they will demonstrate all the basic techniques required to get going with the software.

With a fresh schematic layout, we'll start by adding two sets of traffic lights and a PIC16F84. Create a new design, choose the component icons (each icon has a tooltip with usage instructions and context-sensitive information), and then left-click the letter "P" above the Object Selector to open the Library Browser. Now, the Library Browser will show up above the Editing window.

Window (see Basic Schematic Entry in the ISIS Manual For more information).

To add the traffic lights to the Object Selector, double-click on the result after typing "Traffic" in the Key words area on the keyboard. Use the PIC16F84A in the same way. Close the Library Browser after selecting TRAFFIC LIGHTS and PIC16F84 for the design, then click once to the left in the Object Selector to choose PIC16F84 (this should highlight your selection and a preview of the component will appear in the Overview Window at the right of the screen). To add the component to the schematic, left-click on the Editing Window. Repeat the step to add two sets of traffic lights to the schematic.

- Wire Placement
- Wire Repeat
- Dragging Wires

If the version you have drawn differs in any way from ours, we advise loading the finished version of the circuit at this stage to avoid confusion. In addition, if you don't own the PIC Microprocessor Model Library, you must first load the provided sample file in order to proceed.