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PROTECTION OF CROPS FROM WILD ANIMALS

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Abstract The world is nowadays running with lot of fields everywhere in the form of crop yield. Whatever may be the crop and problem in the field of animals is estimated by this project for optimized solution. In the field of agriculture, the crop yield is getting reduced by the wild animals' attacks. The attack of animals in the agriculture is one of the biggest issues dealing nowadays. The farmers are suffered a lot by the animal attacks. Sometimes people also lost their lives while they try to banish the animals out of their place. The animals enter into the agricultural land because of the lack of water resources in the forest areas and deforestation. After facing this type of problems, we had an idea is to develop a protection of crops from wild animals. Then the yielder can easily verify the animal in agriculture.

Keywords: MSP430, Energia IDE, GSM Sim900A, Audio module

I. INTRODUCTION

1.1 Introduction to Texas instruments

A Texas instruments is one kind of a computer system mainly designed to perform several tasks like to access, process, store and also control the data in various electronics-based systems. Texas Instruments (TI) is a global analog and digital semiconductor IC design and manufacturing company. In addition to analog technologies, digital signal processing (DSP) and microcontroller (MCU) semiconductors, TI designs and manufactures semiconductor solutions for analog and digital embedded, application processing, and Education Technology.

Characteristics of an Texas instruments: The important characteristics of an embedded system are:

- Speed (bytes/sec): Should be high speed
- Power (watts): Low power dissipation
- Size and Weight: As far as possible small in size and low weight
- Accuracy (%error): Must be very accurate
- Adaptability: Height adaptability and accessibility
- Reliability: Must be reliable over a long period of time

So, a Texas instruments must perform the operations at a high speed so that it can be readily used for real time applications and its power consumption must be very low and the size of the system should be as far as possible small and the readings must be accurate with minimum error. The system must be easily adaptable for different situations.

1.2 Applications of Texas instruments

The World is filled with Embedded Systems. The development of Microcontroller has paved path for several Embedded System applications and they play a significant role in our modern-day life in one way or the other. Starting from consumer electronics like Digital Cameras, DVD Players to high end and advanced systems like Flight Controllers and Missile Guidance Systems, embedded systems are omnipresent and became an important part of our life. Texas instruments find numerous applications in various fields such as digital electronics, Telecommunications, computing network, smart cards, satellite systems, military defence system equipment, research system equipment, and so on. Another important concept we are hearing these days is Real Time Systems. In a

real time, system, Real Time Computing takes place, where a computer must generate response to events within certain time limits. In recent days, we are showered with variety of information about these embedded controllers in many places

1.3 Motivation

Agriculture is the most commonly faced problem nowadays. In present days, wild animals are special challenge for farmers throughout the world. Animals may cause serious damage to crops. They can damage the plants by feeding on plant parts or simply by running over the field and trampling over the crops. Due to over population it occurs a deforestation this results in shortage of food, water and shelter in forest areas. So, Animals interference in residential areas is increasing day by day which affects human life and property causes human animal conflict but as per nature's rule every living creature on this earth has important role in eco- system. Agriculture is the backbone of the economy but because of animal interference in agricultural lands, there will be huge loss of crops. Elephants and other animals coming in to contact with humans, impact negatively in various means such as by depredation of crops, damaging grain stores, water supplies, houses and other assets, injuring and death of humans. Farmers in India face serious threats from pests, natural calamities &damage by animals resulting in lower yields Traditional methods followed by farmers are not that effective and it is not feasible to hire guards to keep an eye on crops and prevent wild animals. Since safety of both human and animal is equally vital. Different technologies and concepts are implemented to verify the agriculture problem. With regard to this problem, we had made an effort to develop the system which will monitor the field

II. BLOCK DIAGRAM

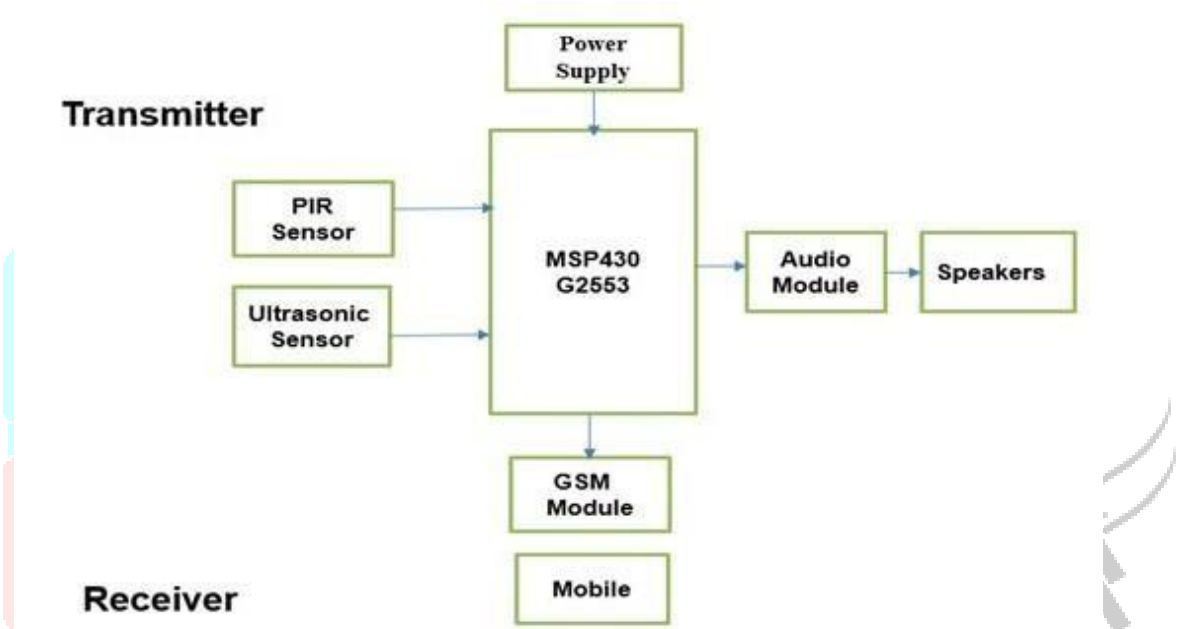


Fig: Block Diagram for protection of crops from wild animals

III. HARDWARE COMPONENTS

MSP430 G2553:

- The device features a powerful 16-bit RISC CPU, 16-bit registers, and constant generators that contribute to maximum code efficiency.
- The MSP430G2x13 and MSP430G2x53 series are ultra-low-power mixed signal microcontrollers with built-in 16- bit timers, up to 24 I/O capacitive-touch enabled pins, a versatile analog comparator, and built-in communication capability using the universal serial communication interface.

Fig: Mixed Signal Processor

PIR SENSOR:

- It is an electronic device that measures infrared (IR) light radiating from objects in its field of view.
- It allows you to sense motion around within approximately 10m from the sensor. This is an average value, as the actual detection range is between 5m and 12m Power is usually up to 5V.

Fig: PIR Sensor

Ultrasonic Sensor:

- It provides 2cm - 400cm non-contact measurement function, the ranging accuracy can reach to 3mm.
- It includes transmitters, receiver and control circuit.
- Whenever any obstacle comes ahead of the ultrasonic sensor the sound waves will reflect back in the form of echo and generates an electric pulse.
- working at voltage of 5V.

Fig: Ultrasonic Sensor

GSM MODULE:

- GSM module can be communicated to Microcontroller using normal serial USART protocol.
- Communication is being done using regular GSM modem AT commands.
- GSM is a mobile communication modem it is stands for global system for mobile communication.
- Dual band 900/1800 megahertz.

Fig: GSM Module

APR (Audio Voice Recorder & Playback):

- The aPR33A3 is a powerful audio processor along with high performance audio analog-to-digital converters (ADCs) and digital-to-analog converters (DACs).
- It can record and playback the message averagely for 1, 2, 4 or 8 voice messages by switch.
- It is suitable in simple interface or need to limit the length of single message.

Fig: Audio Voice Recorder & Playback

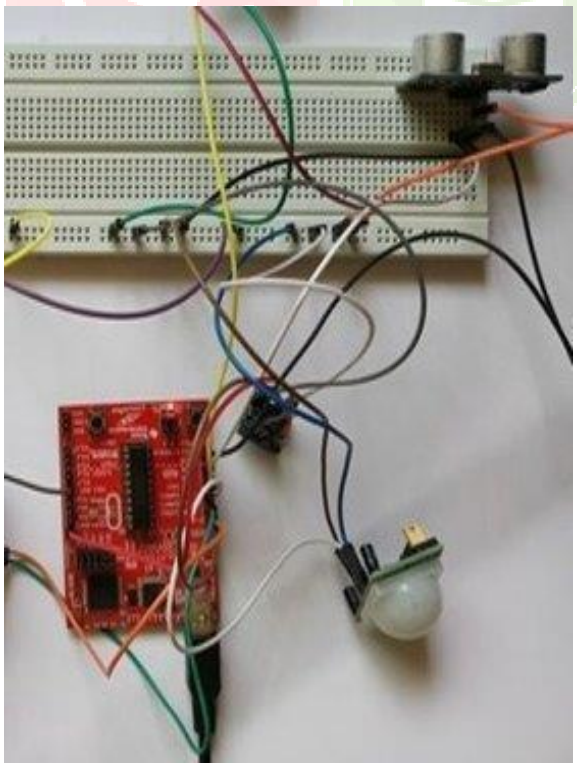
Speakers (8 Ohm):

- The purpose of speaker is to produce audio output that can be heard by the listeners.
- Speakers are the transducers that used to convert the electromagnetic waves into sound waves. It receives audio input from computer or audio receivers.
- The input fed to speaker is in analog or digital form. Analog speakers simply amplify electromagnetic waves into sound waves while digital first convert the signal into analog and then amplify it.

Fig: Speakers

IV. RESULTS

This project gives the effective output. The project is executed practically and finally we are able to get the required result with full reliable. The following images give the output of the working program.



V. CONCLUSION

The problem of crop vandalization by wild animals has become a major social problem in current time. Thus, this project carries a great social relevance as it aims to address this problem. Finally, protection of crop from wild animals is verified at every instant. This project provides the accurate and reliable results with low cost and easily understood concept and also it will help farmers in protecting their orchards and fields and save them from significance financial losses. The Technology used in this project is also easily available. This project can be turned into product and made available into the market so that small scale industries can implement it. Even though this project is reliable there is a drawback. The program gets complex when a multiple number of are attracted in single crop, because different elements have to be considered. So, we can divide into different groups so that it could be easy for developing. In final the project gets complex when more Ultrasonic sensors are considered. If three sensors are used the verification process will be more difficult to give an alert to the farmer. Because the verification process for one Ultrasonic Sensor is different from another. So, for more Ultrasonic sensors the program gets complex and sometimes the controller cannot handle it. To overcome this solution, we have to limit the number of Ultrasonic sensors to the controller. As well as this project will help in achieving better crop yields thus leading to their economic well.

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