Wireless Landmine Detector With Weather Indicaton

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Abstract-

- *Automatic control is the use of various control system for operating any equipment or device with minimal or reduced human interventions .*
- *The communication can be done by receiver and transmitter using channels , Bluetooth , WIFI , etc. the landmine detecting robots are designed to cover maximum possible area of landmine field for detection of landmines.*
- *. The Landmine detecting robots are designed to cover maximum possible area of landmine field for detection of landmines*
- *Based on the range , no of channels can be used by the RF systems . The landmine detection can be done by the formation of the detector circuit using microprocessor .*
- *An arm detector is fixed by using the servo motors. In order to mark the exact position of the landmine and to diffuse that is the motto of this paper.*
- *The body of the detector is designed with geared motors. The weather of the atmosphere can be sensed by DHT module .*
- *The weather will be shown in the LCD display. Geared motors are controlled by the RF receiver and transmitter.*

I. INTRODUCTION

A land mine is an explosive gadget hidden under or on the ground and intended to obliterate the handicap foe targets, running from warriors to vehicles and tanks, as they disregard or close to it. Such a gadget is commonly exploded naturally by method for pressure when an objective strides on it or rolls over it, albeit other explosion components are utilized.

This may cause harm by direct shoot impact, by parts that are tossed by the impact, or by both. The name starts from the old act of military mining, where passages were burrowed under foe strongholds or troop arrangements. These murdering burrows were first crumpled to decimate the objectives situated above, however they were later loaded up with explosives and exploded so as to cause much more noteworthy destruction.

These days, in like manner speech, land mines for the most part allude to gadgets explicitly made as people killing or against vehicle weapons. In spite of the fact that numerous sorts of extemporized dangerous gadgets ("IEDs") can in fact be delegated land mines, the term land dig is normally saved for fabricated gadgets intended to be utilized by perceived military administrations, while IED is utilized for stopgap gad- gets gathered by paramilitary.

Communication is established between the explosive detection robot and the command signal issue unit. In this study we used RF technology to send the message to the observer. The model was developed to sense various kinds of materials and to have a landmine free surface around the world.

II. EXISTING SYSTEM

GPR has been considered as the most promising subsurface sensing technique for landmine clearance operations in combination with a metal detector. This is because of its ability to detect both metallic and nonmetallic landmines. Furthermore, the capability for imaging and post processing of data enables the identification of detected objects. A system combining GPR and a metal detector is commonly called a dual sensor. The system uses the metal detector as the primary sensor for the detection and localization of metal-containing objects, after which it switches to GPR as the secondary sensor for target identification. GPR for landmine detection commonly employs relatively high frequencies in order to detect and/or image small objects near the surface and also to reduce the size of the antennas for easier handling and higher mobility. With high frequencies, GPR becomes more sensitive to the heterogeneity of the media surrounding the object, which results in unwanted scattering in the data. The unwanted scattered waves are commonly referred to as clutter. Clutter degrades the quality of the GPR data and makes their analysis and interpretation difficult. In the case of landmine detection, a false analysis or interpretation of the data may lead to an accidental detonation. The application of IOT in this landmine can cause a technical problem. The internet of things includes WIFI , Bluetooth , GPS etc.

III. PROPOSED SYSTE

In our proposed system a robot with a wheels which performs mine detection. Because there are many personnel mines remaining from wars, it is desirable to provide a safe, inexpensive tool which civilians can to detect the mines. The robot has a capability to detect the path of going forward and backward. The movement can be done with the motor which has been turn easily. Normally the wheel conducting vehicle facing hard to turn left or right but our robot does not create those issue. It is common to evaluate the performance of a metal detector by calculating the probability of detection. The addition of humidity sensor will be useful for indicating the weather condition. The diameter of the coil can be extended to detect as deep as under the ground. Improve decision-making and asset performance by measuring both financial and non-financial indicators that affect overall profitability. The exact location of the land mine can be marked and the future explosion can be avoided.

IV. ADVANTAGES

- The digital frequency hopping system is used to control the detector over 2kms.
- The Temperature conditions around the surroundings can be sensed.
- The man power and the valuable time can be saved and the individuals can be concentrated in other departments.

V. RADIO FREQUENCY SYSTEM

The radio-frequency system, or RF system, supplies power to the ALS in the form of microwaves. Microwaves are radio waves with a wavelength between about one meter and one millimeter, which are the wavelengths used for radio and television broadcasts as well as radar and microwave ovens. Most parts of the RF system supply microwave radiation with a wavelength of about 0.6 meter (see Electromagnetic Radiation for an explanation of wavelengths). Microwave power is used to energize electrons, keeping them whirling around the ALS storage ring at almost the speed of light. Eventually, the electrons release this energy as x rays and ultraviolet light. Scientists use this light, which is called synchrotron radiation, to carry out experiments at the ALS. How important is the RF system? All the energy released as synchrotron radiation originates as RF power.

VI. HARDWARE DESCRIPTIO

MICROCONTROLERS:

A microcontroller is an integrated circuit (IC) device used for controlling other portions of an electronic system, usually via a microprocessor unit (MPU), memory, and some peripherals. These devices are optimized for embedded applications that require both processing functionality and agile, responsive interaction with digital, analog, or electromechanical components. The prefix “micro” implies smallness and the term "controller" here implies an enhanced ability to perform control functions. As stated above, this functionality is the result of combining a digital processor and digital memory with additional hardware that is specifically designed to help the microcontroller interact with other components. A microcontroller can be seen as a small computer, and this is because of the essential components inside of it; the Central Processing Unit (CPU), the Random-Access Memory (RAM), the Flash Memory, the Serial Bus Interface, the Input/output Ports (I/O Ports), and in many cases, the Electrical Erasable Programmable Read-Only Memory (EEPROM). The CPU, sometimes called a processor or microprocessor, controls all of the instructions/data flow that it receives. Its two main components are the Arithmetic Logic Unit (ALU), which performs arithmetic and logical operations, and the Control Unit (CU), which handles all of the processor’s instruction executions. RAM is a component that temporarily stores data, and can be accessed quickly. It provides quick read-and-write access to the storage device. This differs from most other memories as it takes longer for data to be extracted since the data isn’t readily available.

METAL SENSOR MODULE:

The module operates by inducing currents in metal objects and responding when it occurs. A nice onboard buzzer signals when it detects something and an onboard potentiometer allow adjustment of sensitivity.

The clever part of the design is the single rectangular coil made by etching one continuous track on the printed circuit board. If you look very carefully at the printed circuit board, you can see that the rectangular coil is tapped at one turn i.e. a single coil with a precise tapping at one turn. The coil starts at the top side of the double-sided printed circuit board and makes square loops towards the center, A via in the center of the printed circuit board takes the coil to the other side of the printed circuit board and the same set of tracks are on the bottom side. The tuned circuit (a coil plus a capacitor across it) formed here generates a smooth sine wave signal. Keep note, the signal produced here comes from the natural ability of the coil and the capacitor across it, and hardly needs any other components. But Q1 helps the tuned circuit to generate the sine wave signal as Q1 supplies the essential pulse of energy at the right moment in each cycle (it turns on

at the start of each cycle and delivers the pulse of energy and then turns off). Note that the signal coming out from L1 is out-of-phase with that of L2. Here, L1 will deliver a signal that increases the noise produced by Q1 to create an oscillator that has a certain amplitude. We can control the amplitude by the trimpot VR1. This signal is passed to Q2 where it gets an uplift and prevents C4 being charged via R2, thus disables Q3 and the piezo-sounder SP1 does not make a noise in idle state. The major advantage of this type of metal detector circuitry is simple construction of both the device and its search-head (coil), but one drawback is its poor sensitivity (very short detection range). This is an ingenious design idea for learning how simple metal detectors/locators work. That's really all there's to it.

I2C MODULE:

I2C combines the best features of SPI and UARTs. With I2C, you can connect multiple slaves to a single master (like SPI) and you can have multiple masters controlling single, or multiple slaves. This is really useful when you want to have more than one microcontroller logging data to a single memory card or displaying text to a single LCD. Like UART communication, I2C only uses two wires to transmit data between devices:

SDA (Serial Data) – The line for the master and slave to send and receive data.

SCL (Serial Clock) – The line that carries the clock signal.

With I2C, data is transferred in *messages*. Messages are broken up into *frames* of data. Each message has an address frame that contains the binary address of the slave, and one or more data frames that contain the data being transmitted. The message also includes start and stop conditions, read/write bits, and ACK/NACK bits between each data frame:

Start Condition: The SDA line switches from a high voltage level to a low voltage level *before* the SCL line switches from high to low.

Stop Condition: The SDA line switches from a low voltage level to a high voltage level *after* the SCL line switches from low to high.

Read/Write Bit: A single bit specifying whether the master is sending data to the slave (low voltage level) or requesting data from it (high voltage level).

ACK/NACK Bit: Each frame in a message is followed by an acknowledge/no-acknowledge bit. If an address frame or data frame was successfully received, an ACK bit is returned to the sender from the receiving device.

DHT11 MODULE:

DHT11 can measure temperature from 0°C to 50°C with ±2.0°C accuracy, and humidity from 20 to 80% with 5% accuracy. Note that the sampling rate of the DHT11 is 1Hz, meaning you can get new data from it once every second.

Operating Voltage: 3.5V to 5.5V

- Operating current: 0.3mA (measuring) 60uA (standby)
- Output: Serial data
- Temperature Range: 0°C to 50°C
- Humidity Range: 20% to 90%
- Resolution: Temperature and Humidity both are 16-bit
- Accuracy: ±1°C and ±1%

Pin Description:

- DHT11 is a 4-pin sensor, these pins are VCC, DATA, GND . Communication with Microcontroller:
- DHT11 uses only one wire for communication. The voltage levels with certain time value defines the logic one or logic zero on this pin.
- The communication process is divided in three steps, first is to send request to DHT11 sensor then sensor will send response pulse and then it starts sending data of total 40 bits to the microcontroller
- To start communication with DHT11, first we should send the start pulse to the DHT11 sensor.
- To provide start pulse, pull down (low) the data pin minimum 18ms and then pull up, as shown in diag.
- After getting start pulse from, DHT11 sensor sends the response pulse which indicates that DHT11 received start pulse.
- The response pulse is low for 54us and then goes high for 80us.
- After sending the response pulse, DHT11 sensor sends the data, which contains humidity and temperature value along with checksum.

VII. CONCLUSION

In the course of study to have examined the possibility of a novel metal discrimination system as it is the

need of the day when demining is considered. Commercially available metal detectors which are used in demining have very high sensitivity but unfortunately none have good discrimination between landmines and other ferromagnetic materials. Results from this research show using a simple technique, different ferromagnetic objects could be classified into different classes. Initial look was given to Humanitarian Demining and related K&cD, most of the data were collected from the field visit and server. The field visit was a very useful one into his regard where I was able to get the first hand information on landmines and its impact. In the technical point of view, have examined the types it metal detectors giving emphasis to Very Low Frequency metal detectors. VLF IS considered to be the ideal technology to discriminate the ferromagnetic objects when compared with others and further development in the metal detector construction with this work implemented Would definitely help to speed up the demining When the experimental point of view is considered, the results are in the acceptable level and can come to the following conclusions from the experimental results .Aliasing, considered to be the most descriptive phenomenon in signal processing. issued in this study for constructive purpose. The advantage of using aliasing is that the number or samples taken in the computing process is very less and thus the processing time is increased very much. When the Discrete Wavelet Analysis IS Used in the process as described in the earlier chapter an integrated chip could be used as the Wavelet Analyze ser thus gives more accurate results at a higher speed. Thus Is very essential in real word demining Usage of intelligent classification system instead of a conventional classification system like lookup table is that this can adapt to the environmental changes, thus the classification is more accurate.

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