

DESIGN AND STUDY ON SOPHISTICATED ROBOTIC SYSTEM FOR DETECTION AND ANALYSIS

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ABSTRACT

Robotics has been a major of superior manufacturing for over 40 to 50 years of the century. As robots and their peripheral tools grow to be greater enlightened, definite, and minikin, these structures are more and more being utilized for amusement, defence, and monitoring purposes. A far off managed monitoring robotic is described as any robotic that is control and managed from far distance to record images/video for specific cause. Mobile robots that are managed from far distance has necessary roles in area of defence. Such structures are presently being researched by using a quantity of organisation. Dealing with various terrain locations greater needs on the cellular robot's propulsion system, amongst different systems. Power administration and new era drive-train structures make use of superior substances and rather environment friendly transmissions to attain greater speed, accuracy, and sturdiness to work in an extensive vary of environments. Enhanced electricity administration comes thru greater superior fuel cells and newly designed battery and charging systems. Customize a robotic to ascend and descend barriers in disorderly environments with ease is a format venture and makes use of greater power. The machine need to be capable to overcome each normally fashioned barriers such as stairs and these of an unidentified form such as rocks, downed trees, and different assorted entity.

Keywords: Metal detector, MCU, Radio frequency (R.F), Robot function, land-mine detection, wireless controlled, solar powered, mobile robots, Internet of things (IoT).

I. Introduction

Robotics are major superior construct from 40 to 50 years of a century. As robots and their component tools end up extra sophisticated, dependable, and miniaturized, these structures are an increasing number of use for amusement, defence and observation purposes. A faraway managed observation robotic is described as any robotic that is remotely managed to seize images/video for unique purposes. Mobile robots that are managed remotely have necessary guidelines in region of rescue and military. A rescue robotic is a form of surveillance robotic that has been designed for the reason of rescuing people. Common conditions that appoint rescue robots are mining accidents, city disasters, hostage situations, and explosions. Metal detecting robots are self-reliant robots or remote-controlled units designed for lookup functions for actual time evaluation by means of the use of internet of things. Such structures are presently being researched with the aid of a wide variety of organization. Dealing with different terrain locations more needs on the mobile robot's propulsion system, amongst different systems. Power administration and new technology drive-train structures make use

of superior substances and rather environment friendly transmissions to acquire greater speed, accuracy, and sturdiness to work in an extensive vary of environments.

The reason of Landmine detecting robotic is to cowl most feasible area, presentation of landmines and the left over place on a visible map with accuracy in mm. The data from the paper gives a proto-type mannequin of landmine identification of the robotic system that is effective but less in price, handy command, having the required accuracy and is outfitted with visible interface for landmines plotting.

A brilliant robot is no longer sci-fi. While generally a robot has been characterized as any machine that can be modified to play out a scope of troublesome or complex tasks/capacities, shrewd advanced mechanics as an innovation contains robots that can likewise team up with individuals, gain from its current circumstance/encounter and refine or change its activities appropriately. The advancements in sensor innovation and developing revenue and interest in keen mechanical technology empowered by Artificial Intelligence (AI) and the Internet of Things (IoT) are driving associations to progressively take a gander at clever machines/shrewd robots to customize client

experience, increase effectiveness and further develop usefulness. As indicated by Gartner's IT glossary, "brilliant machine advancements learn all alone and can create unforeseen outcomes. They should adjust their conduct dependent on experience (learning), not be absolutely subject to directions from individuals (learn all alone), and have the option to think of unexpected outcomes".

II. Overview of Internet of Things

These days IoT is wherever on the planet to make the more brilliant world. Due to IoT we can see many savvy gadgets around us. Numerous individuals, including myself, hold the view that urban areas and the world itself will be overlaid with detecting and incitation, many inserted in "things" making what is alluded to as a shrewd world. For instance, today numerous structures as of now have sensors for endeavoring to spare vitality, home computerization; autos, cabs, and traffic lights have gadgets to attempt to improve security and transportation; individuals have advanced cells with sensors for running numerous valuable applications; mechanical plants are associating with the Internet; and social insurance administrations are depending on expanded home detecting to help remote prescription and health. Presently in Technology world, everything will be Digital. The Internet is venturing into big business resources and purchaser things, for example, autos and TVs. The issue is that most endeavors and innovation sellers presently can't seem to investigate the potential outcomes of an extended Internet and are not operationally or authoritatively prepared. Gartner distinguishes four fundamental utilization models that are rising:

- Manage
- Monetize
- Operate
- Extend

These can be applied to people, things, information, and places, and therefore the so called "Internet of Things" will be succeeded by the "Internet of Everything."

In this context the concept of community convergence the use of IP is imperative & depends on the use of a frequent different

variety service of IP community helping a vast vary of functions and services. The use of IP to talk with and manage small units and sensors opens the way for the conjunction of large, IT-intended networks with actual time and functional networked applications.

III. Objective of Paper

As per our proposed methodology we are try to build a Smart Robotic system which is able to detect the metallic objects present in mine. So these are the followings points where our proposed methodology will give contribution:

1. We will able to discover the place where metallic substance present.
2. We will able to take smart Robot who is able to take decision if there is any wrong incident happen.
3. Our system will communicate by IoT so researcher can easily get the information.
4. Our system uses ML & AI concept so we are able to capture images and video and on the spot we will analysis that and send alert to the researcher for analysis.
5. This system is power efficient as we are using solar technology.

Problem Statement

As we know in present era there is need of smart Robot which are able to make our life easy. As we are living in the era of 3D and 5G technologies where we are capable to make those type of robots as per the research there are lots of problems are there which still needs to be solved:

1. Power utilization by the Robots.
2. Lack of the Smart Robots.
3. There is need of intelligent robot that is able to take decision and detect the metallic objects in mine.

Scope of Leaf Infection Detection:-

Advanced mechanics is the juncture of designing and science that incorporates mechanical designing, electrical designing, software engineering additionally it is not any more an arising field as it has developed such a great amount over the most recent 10 years and it is approaching a summit point .It is an always developing field and numerous roads have opened up in ongoing past. The guarantee of mechanical technology is not difficult to

portray yet difficult for the psyche to get a handle on. A robot is a mechanical or virtual canny specialist that can perform assignments consequently or with direction, normally by controller. Practically speaking a robot is generally an electro-mechanical machine that is directed by PC and electronic programming. Robots hold the guarantee of moving and changing materials without hardly lifting a finger as a PC program changes information. However, the dark spot stays wide with regards to Research mindfulness in the field of Robotics and Automation. At some point or another Robotics and robotization will discover its application in each aspect of human existence. The headway in innovation would bring a day of robots ubiquity.

IV. Methodology

In this work basically we are planning to design a smart Robotic system which is very useful for mine detection and with the help of internet of things we can analyze the real time action of robot. Here we are using the concept of robotics, mechatronics, machine and deep learning so robot will take a proper action based on the path and detect whether there is any metal or any kind of metallic material present in the mines. Here we will design a system which will have an inbuilt camera and also the communication network so it can identify the path and based on that provide the real time data. Our proposed robot is always connecting with internet and use the technology of Internet of things.

These are the features we are try to implement on this system:

1. Solar Powered.
2. Self-Decision maker.
3. Work on Low Power.
4. IoT enabled.
5. Long Range communication.
6. Strong body system.
7. Surveillance.

Raspberry Pi

Raspberry Pi is the name of a series of single-board computers made by the Raspberry Pi Foundation, a UK charity that aims to educate people in computing and create easier access to computing education. The Raspberry Pi launched in 2012, and there have been several iterations and variations released since then. The original Pi had a single-core 700MHz CPU and just 256MB RAM, and the latest model has a quad-core 1.4GHz CPU with 1GB RAM. The main price point for Raspberry Pi has always been \$35 and all models have been \$35 or less, including the Pi Zero, which costs just \$5. All over the world, people use Raspberry Pi's to learn programming skills, build hardware projects, do home automation, and even use them in industrial applications. The Raspberry Pi is a very cheap computer that runs Linux, but it also provides a set of GPIO (general purpose input/output) pins that allow you to control electronic components for physical computing and explore the Internet of Things (IoT).

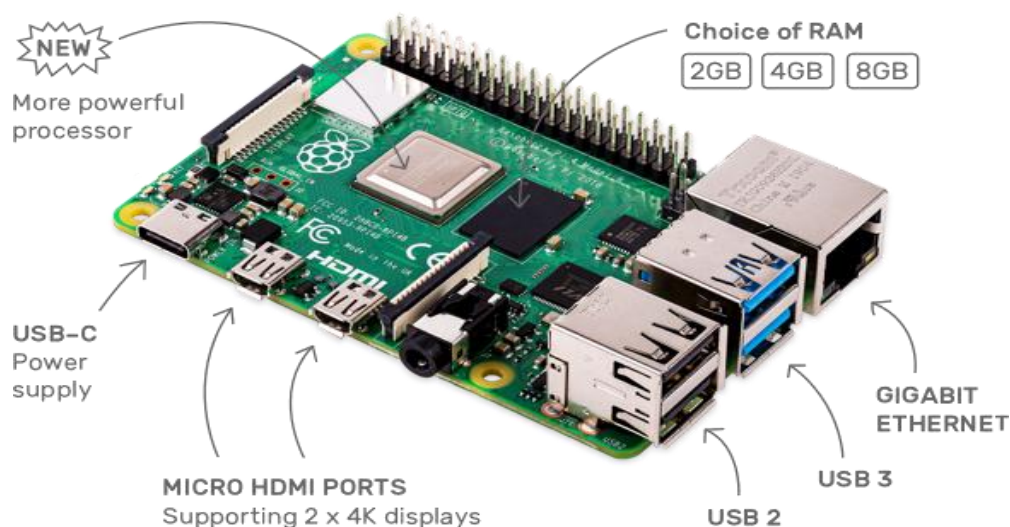


Fig.1Raspberry pi

Raspberry Pi Zero W specifications

Here is the Raspberry Pi Zero W specs:

- 1GHz single-core ARMv6 CPU
- Video Core IV GPU, 512MB RAM
- Mini HDMI and USB on-the-go ports
- Micro USB power
- HAT-compatible 40-pin header
- Composite video and reset headers
- CSI camera connector
- 802.11n wireless LAN
- Bluetooth 4.0



Fig.2 People count



Fig.3 Land mine detection



Fig.4 Road analysis

Following are the above figure shows the important and critical works of smart robots.

V. Conclusion

Robotics have a great future, in current era as we know AI, ML & IoT create a great technology system, due to this technology robotics also got a great wings, 20 year back robotics is only based on embedded system, but now after AI, ML & IoT robotics is very advance, in this thesis basically we design and implement a robot which is useful for the military purpose as we know due to lack in technology many times our soldiers died, but if we have a smart robot which will run in front of the military and provide all the details to the military, so military will ready for all types of emergency issues. As per our proposed approach, we try to make a smart robot who is able to take self-decision robust system which is able to handle critical situation, Easy to communicate, try to build a system which is able to surveillance the path and detect metallic material in accurate manner. AS per our

proposed approach we are able to save the cost and also create a real time system which is based on solar, ML & IoT. Our proposed robot is far better than the previous existing system, here we are able to save lots of power, cost & size.

Future Scope

There are following matters which require future implementation for proposed methodology.

1. Implementation of low cost more intelligent robotics system.
2. Implementation of robots which have war equipment.
3. Implementation of robots who know how to fight in emergency situations.
4. Hardware implementation.
5. Better work can be done to minimize the initial cost.
6. Minimize the faults in deployment mechanism.
7. Further scope lies in reducing the torsion of the coil.

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