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WIRELESS MOBILE TECHNOLOGY BASED FIRE FIGHTING MULTI FUNCTION ROBOT FOR DEFENSE APPLICATIONS

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ABSTRACT:

In these quickest times human beings and the machineries works quicker to accomplish the varied tasks. These activities are slows down due to some natural and artificial hazards, from these hearth plays a significant role .Many industries and domestic areas that are destroyed and littered with hearth accidents, such cases are eradicated by this "fire management robot". This golem is integral with mobile app uses golem technology to regulate the robot. Golem provides the user friendly platform to regulate the operation. The golem that is controlled by the mobile application that is employed for water spraying, greenhouse emission gas cylinder operates with the assistance of a devotee system and additionally includes Higher Resolution zooming Camera with the assistance of this mobile app. The situation of the golem is monitored by mistreatment the GPS pursuit system.

KEYWORDS: Fan, greenhouse emission gas Cylinder, Water sprayer, WI-FI defend, Mobile app and High resolution camera, GPS pursuit system.

I. INTRODUCTION:

The aim of this project is to gift the standing of the present trends with the accomplishment of fireside golem and mobile app controlled robotic vehicles and descriptive potential for future application. Dissimilar applications of mobile app system vehicles that act as a fireplace engine are examined and compared with typical systems, wherever 3 main teams of field operations are known to be the primary potential utilization. Moreover, we have a tendency to research the economic potential of applying mobile management robotic vehicles. Focus is going to be placed on potential labor value savings and sizes for operation, daily operating hours. Potential environmental impact, energy prices and questions of safety

1.1 SURVEY OF FIRE ACCIDENT:

We've got seen many fire accidents like forest fires, coal fires, gas fires, oil fires, building fires, industrial fires, chemical fires, electrical contact hearths and there are completely different hearth safety measures that are living to shield folks from these fire accidents. The UK hearth and rescue services use variety of risk identification methodologies. The fireplace Service Emergency cowl (FSEC) Toolkit is across the country out there methodology, that is Associate in Nursing IT based mostly tool which might be wont to assess the danger from hearth and alternative incidents, permitting the fireplace and rescue service to apportion resources proportionate to the danger [1].

A mathematical model is employed by the FSEC toolkit to predict the amount of lives lost in dwellings fires, special services incidents and alternative building fires, the number of property lost and therefore the total value of the resources allotted [2]. Additionally, all hearth associate in Nursing rescue services are needed to make an Integrated Risk Management arrange underneath the steerage of the fireplace and Rescue Service National Framework [3]. Part of this designing exercise involves the creation of a risk map that indicates the extent of hearth risk gift to little geographical areas supported historic fire incidents. However, these methodologies are shapely to lower output space earth science creating it troublesome to focus on hearth bar resources towards the individual. Village fires are presently viewed together of the best threats to human life as a result of village density will increase the probability of tragedy. Modeling techniques that use mathematical analyses for the planning of fireside safety systems are wide studied [4,5]. However, these studies have restricted sensible use as a result of village homes are designed consistent with individual construction plans, instead of one, economical style. These limitations have crystal rectifier to very advanced hearth safety systems, elevated operational coaching and extra body personal needs. It becomes necessary for qualified operators to stay unceasingly on standby in security companies, protection organizations and municipalities due to the system observance needs [6,7]. in addition, a

high variety of communication system calls makes it troublesome for operators to specialize in their work, that will increase the probability of mistakes [8].

At the subway centre in Daegu, Korea, Associate in nursing pressing communication system decision relating to a fireplace was unnoted due to Associate in nursing overworked operator. Sadly, this oversight crystal rectifier leads to the deaths of 196 folks and therefore the wounding 116. This accident incontestable that the employment of Associate in Nursing communication system may be fatal once immediate action is needed as a result of even a little hearth has the capability for nice tragedy [9,10]. However, despite the presence of fireside safety measures, the prevalence of Journal of engineering, physics and technology, Issue XX, two016 ISSN 2457-905X 2 accidents is frequently inevitable. Taking quite twenty minutes to evacuate from a fireplace, that is one amongst the foremost frequent disasters, greatly reduces survivability [1, 9, 12]. An uniform evacuation of steerage like exit lights are inadequate for guiding evacuees throughout a fireplace, which might produce toxic gases, or once buildings are collapsing [2-3, 8].

A review of literature associated with hearth evacuation in underground transportation systems, e.g., tunnels and subway stations, was administered with the objectives (1) to spot a theoretical framework that may facilitate perceive of human attitude within the event of a fireplace in underground transportation systems, (2) to use the theoretical framework to analyze and to spot issues associated with hearth evacuation in underground transportation systems, and (3) [2].

1.2 WIRELESS TECHNOLOGY:

Generally, a golem could be a mechanical or virtual intelligent agent or any operated machine that may perform tasks in a automatic manner or with steerage and replaces human effort, typically. In apply a golem is sometimes Associate in Nursing mechanical device ma-chine that's target-hunting by pc and electronic program-Ming. Robots may be autonomous, semiautonomous or remotely controlled. The word golem 1st appeared during a play by the Czech author playwright in 1920. Robots might or might not tally and perform functions like kith and kin. However they're usually designed to perform tasks repeatedly associate in nursing in an economical manner [1]. Nowadays, robots do lots of various tasks in several fields and therefore the variety of jobs entrusted to robots is growing steady [2]. Recently, it's typically been not possible for firefighting personnel to access the positioning of a fireplace, when the fireplace causes tremendous property injury and loss of human life, thanks to high temperatures or the presence of explosive materials or the fireplace smoke hazard in tunnel fires. This paper studies and implements the tactic to create a mobile golem with human remote control system so as to assist a foreign operator World Health Organization is found distant from the firefighting golem. The mobile golem sends data of fireside scene to link-attached terminal wirelessly in real time; link-attached terminal receives fire data which can be processed by the mangers pc mistreatment image process programs to assembling the incoming information to use- West African data to choose the right strategy to fight the fireplace and dominant the mobile golem. [3] During this golem because the hearth detector senses the fireplace, it sends the signal to microcontroller; since the signal of the detector is extremely weak the electronic equipment is employed in order that it will amplify the signal and sends it to microcontroller. As presently as microcontroller receives the signal a buzzer sounds, the buzzer sound is to intimate the prevalence of fireside accident. After the sounding of the buzzer microcontroller actuates the motive force circuit and it drives the golem towards hearth place, because the golem reaches close to the fireplace microcontroller actuates the relay and pump switch is created ON and water is besprent on the fireplace through the mechanical device. The target is to create a golem, which can extinguish a fireplace within the servers rooms that are extremely liable to fire.

A candle can represent the fireplace, that has started within the home and that the golem should realize then extinguish. For this reason, a lightweight detector can not be wont to find the fireplace. so as words, the golem should be able to create close light-weight reading as a part of its style complementation. The golem can sense that flame by the assistance of fireside detector. It will be having a wireless camera on its head which will show the precise location of the fireplace on laptop computer or desktop via wireless transmission. Currently the complete functioning are going to be handled manually from the gap, which can scale back human life risk and can increase potency. Alpha I also can be used for the detection of mines. Thus, it's employed in each little areas and field areas. .[5] In some quite emergency things like readying during a building, it's thus troublesome for an individual's being to travel within the fireplace to extinguish it.

So, in future aspects there's a desire to create some special robots/machines having higher heat resistant properties underneath warm temperature conditions. The golem ought to mechanically find the fireplace with the assistance of temperature sensors that are mounted on the robot's surface and to require fast action to extinguish the fireplace. Another most vital feature is needed within the hearth fighting golem ought to be connected to the room with the assistance of wireless affiliation. This study represents the planning of a completely automatic hearth

fighting golem and includes numerous modules like temperature detector LM35, microcontroller PIC 16F8778, 16*2 liquid crystal display and RF (Radio-Frequency) module at 433 megacycle. A 12V dc motor is employed to derive movement.[5] From the recent years, artificial intelligence has clothed to be Associate in Nursing ingredient over that many of us had shown their interest (Ren and Kuo, 2007).

Robotics has gained quality thanks to the advancement of the many technologies of computing and technology creating human life easier and comfy (Sivas and Kalaimani, 2013; Sangaralingam and Sathish, 2014). Here, the interest of this study is to form a completely automatic hearth fighting golem which might facilitate in dealing hearth issues in households and little scale industries[5]. Journal of engineering, physics and technology, Issue XX, 2016 ISSN 2457-905X three In today's business, industrial and domestic world, Automation plays a vital role, it's truly a briefing of various parts so as to manage, direct, sense and command itself to realize a desired result.

Automatic hearth Fighting Robot" project employs the electrical thermostat technology for the dominant the fireplace twenty four hrs. The system is value effective, incorporates a wide applications that once implement will show sensible and effective result. It may be use deliberately in industrial applications, business and in domestic sectors wherever the necessity of automatic work demands. Synchronization of assorted instrumentality involve within the systems like Thermostat detector, water jet, wireless remote and wireless golem device local area network enabled Camera. This can be mean to simulate the $64000 world operation of golem acting as fireplace extinction operation. Symbolic logic provided Associate in Nursing applicable resolution to the otherwise advanced task of mathematically account a particular model for the non-linear system upon that typical management techniques might then be applied. Making golem wireless will increase the effective space of operation, thereby creating it potential to regulate the golem from remote location. Keeping all higher than factors in mind the golem is capable of being remotely controlled and live video buffering like possessing a multimedia system interface was convinced and developed.

[6] Locations possessing potential hazards to an individual's operator are usually ideal things to put in a golem. The employment of robots is a lot of common nowadays than ever before and it's now not completely employed by the serious production industries. From the invention of such a tool, folks and property may be saved at a far higher rate with comparatively lowest injury caused by the fireplace. This could be controlled by mistreatment golem committal to writing interfaced with this golem. We've got used terribly basic construct here, simple to grasp from the potential of beginners or for the masters of this field.

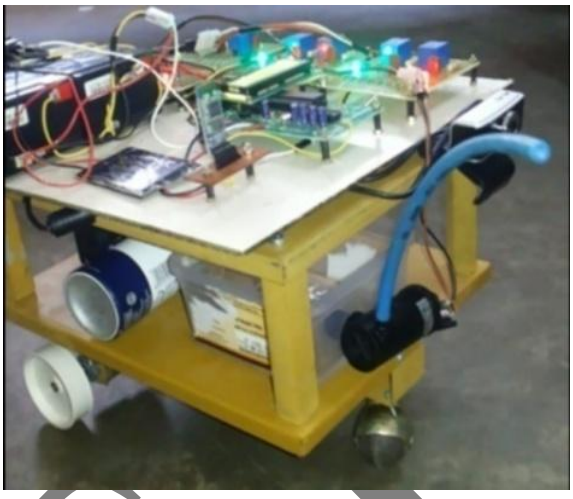

Fig 1 Fire control Robot Vehicle

Fire control Robot that can detect and extinguish a fire on its own is long past due. From the invention of such a tool, folks and property may be saved at a far higher rate with comparatively lowest injury caused by the fireplace. This could be controlled by mistreatment golem committal to writing interfaced with this golem. We've got used terribly basic construct here, simple to grasp from the potential of beginners or for the masters of this field.

1.3 WIRELESS CAMERA MONITORING:

Another differentiating feature concerning this Mobile golem is that the wireless video camera through that we will read and monitor the method happening throughout the fireplace accident. This additionally has the feature to rotate the Camera consistent with our needs to make sure the progress of the work. By this facility, we can closely watch to avoid any misfortune, at identical time perform the general performance terribly accurately, value effective manner and provides assurance on its performance. All those proceedings are going to be viewed clearly on our mobile's screen terribly feasibly sketched in Figure.2.

The wireless camera is employed for creating live demonstration of fireside accident place wherever human isn't out there to relinquish services for stopped the burning place. We have a tendency to mistreatment golem Device Wi-Fi enabled camera instead of traditional camera. It's potential to examine live video buffering mistreatment numerous Wi-Fi camera applications on any golem device or directly on net. That's the rationale we have a tendency to had used the mini wireless camera for look live the place of extinguishes the fireplace within the screen at over distance and therefore it's terribly helpful in buildings like factories, buildings, hospital

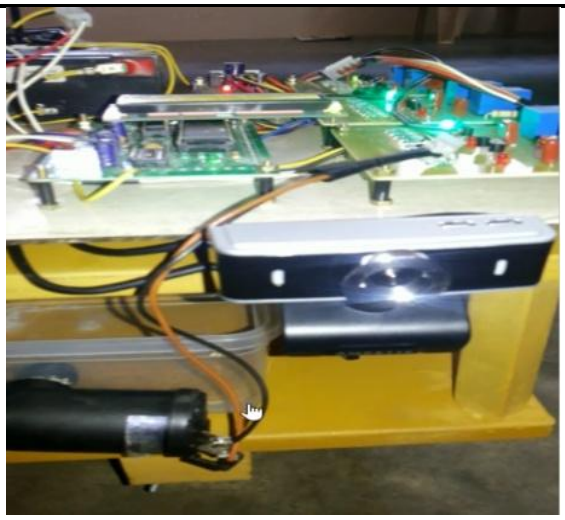

Fig.2 Wireless Camera Monitoring

1.4 FAN WITH CO2 GAS CYLINDER:

Fan With greenhouse emission Gas Cylinder we have a tendency to might operate all told the four directions by Fan and portrayed in Figure.3. The fan has positioned at terribly front which might be operated by mobile app switch that controls to show ON. Once the fan starts it spray the CO2 gas in conjunction with the finish of the task, we have a tendency to might close up the fan it'll stop rotating and spraying.

Fig.3Fan

1.5 CO2 GAS CYLINDER:

CO2 gas cylinder CO2 (CO2) is employed for potable suffusion and dispensing. The gas is most frequently found in restaurants and potable rooms within the style of a gas cylinder in Figure.4. It's additionally wont to extinguish the fireplace within the geographical point.co2 having the flammable characteristics that promptly mixed with the fireplace to extinguish it and it can be provided by means that of sprayers and it additionally simply unfold through fans to hide the fireplace occupied space [21].

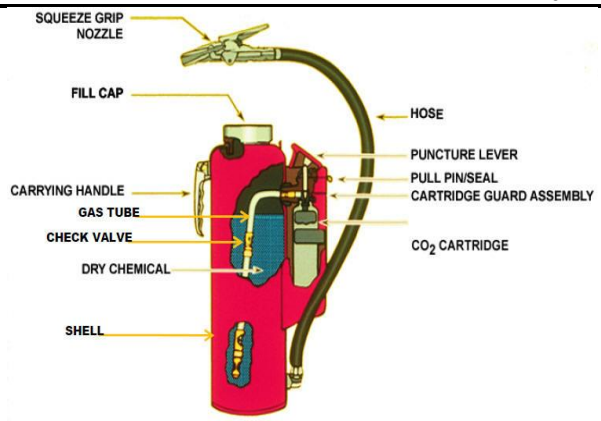

Fig .4 CO2 Gas Cylinder

1.6 WATER SPRAYER:

6 Water Sprayer Robots are used for a spread of business applications. In industries and homes, fires and escape of flammable gases can end in dangerous accidents. There are several potentialities a fireplace will begin in Associate in nursing trade or in any remote space for instance, in paper trade, garments, fuel storages, etc., electrical leakages will result in immense injury. To avoid these we've got developed a fireplace fighting golem. Our project is meant to sense hearth during a building or house and extinguish the fireplace. The fireplace sensors are unbroken at bound necessary planned locations.

When a fireplace happens close to a fireplace detector it senses it and corresponding bit within the encoder are going to be set and is transmitted wireless to the RF receiver, connected to golem. Once the RF receiver receives the signal, the rewriter can decode and informs that hearth detector is activated. The golem can move towards the corresponding hearth detector since the locations of the fireplace sensors already keep within the memory of the golem. Once the golem reaches the situation, movement of the golem can stop and can activate sprayer to extinguish hearth. Once the fireplace is destroyed, spraying is stopped and therefore the golem can come to its initial position and it can operate effectively to regulate hearth with minimum human intervention, extinguish hearth and by the usage of microcontroller and therefore the robotic elements.

We are mistreatment Atmega16 microcontroller. For robotic motion we have a tendency to mistreatment DC motor driven automotive. The most areas of our project are: hearth detector operation (Photodiode), Microcontroller operation, RF transmitter and receiver operation, golem movement operation, Sprayer operation. We've got used photodiode as hearth sensors in our project that photodiodes are unbroken at planned locations. When light-weight falls on the photodiode current is generated. The photograph diode output is connected to the comparator circuit. Once the input to comparator is larger than 5V it offers a high output indicating that there's hearth. Once the output of the

comparator circuit is high i.e. once a fireplace is detected, the corresponding standing little bit of the RF transmitter bit is about. These values are transmitted wirelessly to the RF receiver connected to the golem. It can indicate that hearth detector is activated and therefore the golem will move towards the corresponding hearth detector. 2 hearth sensors (photodiode) are placed at the front of the golem. Once the golem reaches the situation, the sprayer is activated to extinguish hearth. After extinction hearth, the sprayer is turned off. Once extinction hearth, it'll wait till each the front sensors are off. Then it'll come to its initial position.

APPLICATIONS:

• may be employed in server rooms for immediate action just in case of fireside.

• may be employed in extinction hearth wherever likelihood of explosion is high.

For e.g. building kitchens, LPG/CNG gas stores, etc.

• Each operating surroundings requiring permanent operator's attention.

-At powerhouse management rooms.

-At captain bridges.

-At control centers.

• The most purpose is to rescue the folks by extinction hearth during a building. Industries mistreatment RF solutions for observance, control, process, inventory pursuit, information links and Universal Product Code reading devices.

[8] We have a tendency to style the hearth and detection system mistreatment four flame sensors within the fire fight golem, and program the fireplace detection and fighting procedure mistreatment detector based mostly methodology. The fireplace fighting golem is provided with four flame sensors that unceasingly monitor the temperature. If the temperature will increase on the far side the planned threshold price, buzzer sounds to intimate the prevalence of fireside accident and a warning message are going to be sent to the individual personnel within the trade and to near firehouse with the GSM module provided to that. Hearth Fighting golem unceasingly monitors the temperature at four sensors and if hearth accident is true, the golem moves to the direction to that the temperature is recorded to be the comparatively most among the four sensors and extinguishes the fireplace with pump provided to that. When a smoke detector detects hearth it, sprays water everywhere the place, rather than that individual purpose of supply. It voluntarily detects and extinguishes hearth while not human aid [9]. This report describes the outline of the event of the fireproof insulation spray golem No.1 system in one991, as Associate in nursing example of promoting the automation of bailiwick work by taking advantage of a wide-use sort industrial golem.

This was rumored at the ninth International Construction golem conference in 1992. The analysis and development activities are continued and therefore the No.3 system was developed by creating numerous enhancements to the No.1 system and it's currently being applied to the unrestricted sort building automatic construction system. The system consists of 2 major devices are as follows: 1) Fire proof insulation spray golem, and 2) Remote management sort fully-automated plant. The aim of this project, is to explain the positioning of the higher than system within the unrestricted sort building automatic construction system, the main points of the event from the NO.1 machine, through to the NO.2 machine and to the NO.3 machine. Also, the special options of the system, the main points of every constituting device, the composition of the software system and therefore the results of the execution, are going to be represented.

In addition there's discussion of the chance of applying the wide-use sort industrial golem to the development web site in Figure.5 [10] Fireproof insulation spray work dead by mistreatment the dry methodology for buildings of ferroconcrete construction, needs to be performed underneath adverse environmental conditions in the midst of an excellent volume of mud arising from serious labor which incorporates the throwing of materials, the activity of scaffolds, and therefore the moving there from. For this reason, the shortage of younger employees is presenting a retardant. There haven't been several enhancements to deal with these issues and thus, larger scale enhancements by means that of mechanization and therefore the use of recent materials are underneath nice demand. This development, as Associate in nursing example of promoting the automation of bailiwick construction work takes advantage of a wide-use industrial golem.

It aims to form nice enhancements addressing the issues of the standard construction operation, reducing labor and upgrading the standard of the work by structuring a golem system subject to the unaltered combine dry spray methodology, that makes up the bigger a part of the fireproof insulation spray work.[10] remotely controlled through wireless. The golem will move through any path whose motion is controlled through the local area network mistreatment buttons interfaced by a software system program. Once the golem faces a fireplace then it's created to extinguish the fireplace with the assistance of pump motor connected to a tank mounted on its body. Laptop works as a foreign to regulate the motion of the golem either to maneuver it forward or backward and therefore the motion of the hookah up and down of the golem through that it throws water to extinguish the

fireplace. On the golem local area network is enabled through that it receives commands from the laptop.

A microcontroller is interfaced that delivers output consequently for the motors via motor driver IC.[11] The task of spraying the water on the fires difficult task at identical time that is indispensable one. to beat this issue, our Mobile App Robotic offers the new pavement of a vital replacement for the prosperous of that is back bone of the whole world. In this application, we have a tendency to place a motor pump and a sprayer at the highest of the vehicle. The sprayer discovered is presumably to succeed in our targeted space within the place. In each left and right aspect of the tank provisions are out there by fixing the tubes with the nozzles to spray the water. Sprayer to use will put on and off the motor pump directly connected with sprayer through tank to show ON to spray the water. The vehicle may be emotional forward and backward to spray consistent with our convenient by that we will save the time, economy and therefore the price of human life.

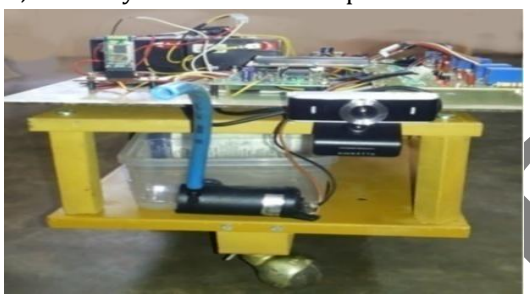

Fig .5 Sprayer

To apply can switch ON and off the motor pump directly connected with sprayer through tank to turn ON to spray the water. The vehicle can be moved forward and backward to spray according to our convenient by that we can save the time, economy and the value of human life.

1.7 GPS SYSTEM:

GSM MODEM:

GSM electronic equipment is employed to intimate the prevalence of fireside accident via SMS. mistreatment GSM electronic equipment a planned message may be send to needed persons and additionally to fireside station in order that they get alerted and reach the place quickly wherever fire broken out. World Positioning System (GPS) could be a space-based global navigation satellite system (GNSS) that has reliable location Associate in nursing time data all told weather and in any respect times and anyplace on or close to the world once and wherever there's an patent line of sight to four or a lot of GPS satellites. It's maintained by the US government and is freely accessible by anyone with a GPS receiver [20]. A golem pursuit system combines the installation of Associate in nursing device during a golem, with purposed signed pc software system a minimum of at one operational base to change the owner or a 3rd party to trace the robot's location, assembling information within the method from the sphere and deliver it to the bottom of operation. Fashionable pursuit systems usually use GPS or GLONASS technology for locating the golem, the data concerning the golem may be viewed on electronic maps via the web or specialized software system in Figure.6 [20]. GSM and GPS based mostly pursuit system can offer effective, real time vehicle location, and coverage.

A GPS- GSM based mostly pursuit system Journal of engineering, physics and technology, Issue XX, 2016 ISSN 2457-905X six can inform wherever your vehicle is and wherever it's been, however long it's been. The system uses geographic position and time data from the worldwide Positioning Satellites. The system has Associate in Nursing "On- Board Module" that resides within the vehicle to be half-track. The On-Board module consists of GPS receiver, a GSM electronic equipment and ARM processor. It will offer tele-monitoring and management system for inter-cities transportation vehicles like taxis and buses.

Fig .6 Gps system

II. FIRE GLAZINGS TECHNOLOGY:

Although glass isn't flammable, monolithic panes of soluble glass aren't a good barrier to the propagation of fireside. The normal method of enhancing the fireplace resistance of glass could be a wire mesh. In a fire, wired glass still cracks like hardened glass would do.

In distinction to traditional glass, however, the fragments arE unbroken along by the wire mesh, therefore protective the unexposed aspect from flames, smoke and combustion gases. This product is termed Pilkington Pyroshield™, today's most generally used hearth resistant product. Wired glass was designed to stop the fireplace spreading. Once glazed in Associate in Nursing applicable frame, it encloses flames, smoke and unsafe gases. It additionally offers some resistance against accidental human impact

2.1 WI-FI CONTROL SYSTEM:

Wi-Fi system the project aims in planning a golem that may be operated mistreatment golem portable in

Figure.7. The dominant of the golem is completed wirelessly through golem good phone mistreatment the Wi-Fi feature gift in it. Here, the golem good phone is employed as a foreign management for in operation the golem.

Android could be a software system stack for mobile devices that features Associate in Nursing software package, middle ware and key applications. Golem boasts a healthy array of property choices on Wi-Fi affiliation and also provides access to a large vary of helpful libraries and tools that may won't to build made applications. On the golem operate, it's indicated by the digital display straightaway.

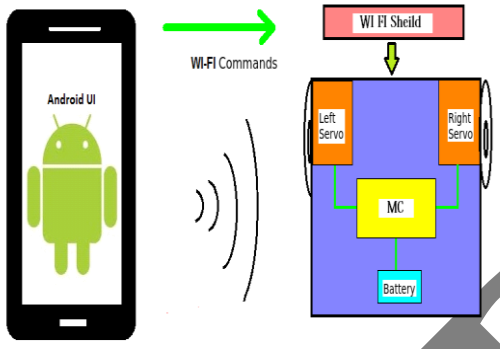

Fig .7 Wi-Fi Control Systems

Wi- Fi is Associate in Nursing open commonplace specification for a frequency (RF)-based, short-range property technology that guarantees to vary the face of computing and wireless communication. It's designed to be employed in mobile phones. Fig .7 Wi-Fi management Systems, the dominant device of the complete system could be a Microcontroller. Wi-Fi module, DC motors are interfaced to the Microcontroller. The information received by the Wi-Fi module from golem good phone is given as input to the controller. The controller acts consequently on the DC motors of the golem. The golem within the project may be created to maneuver all told the four directions mistreatment the golem phone. The direction of the golem is indicated mistreatment crystal rectifier indicators of the golem system. in operation the golem through portable. Usage of golem bit screen good phone in acting the task mistreatment Wi-Fi wireless transmission. Indicating golem directions mistreatment crystal rectifier indicators. [2] Each action we have a tendency to do

III. MOBILE APP CONTROL SYSTEM:

The over View of in Figure.8 , This Project with the assistance of mobile app additionally as mistreatment the blue tooth application, we have a tendency to operate the fireplace management robotic vehicles forward, backward and switch left and therefore the right direction simply. Following identical principle, we have a tendency to management and operate the through the Wi-Fi. Additionally, thereto the camera observance system functions to observe all those higher than mechanism.

At the outer, this diagram plays a significant role to recharge battery to run the motor mounted with robotic vehicles. The golem is found with the assistance of the GPS pursuit system equipped with the mobile app. Further, electric-charging is additionally potential. each actions we have a tendency to do on the golem operate, it's indicated by the digital display straightaway like cutter on/off, sprayer on/off, forward to left/right/reverse/stop of these functions may be indicated by the LCD display .

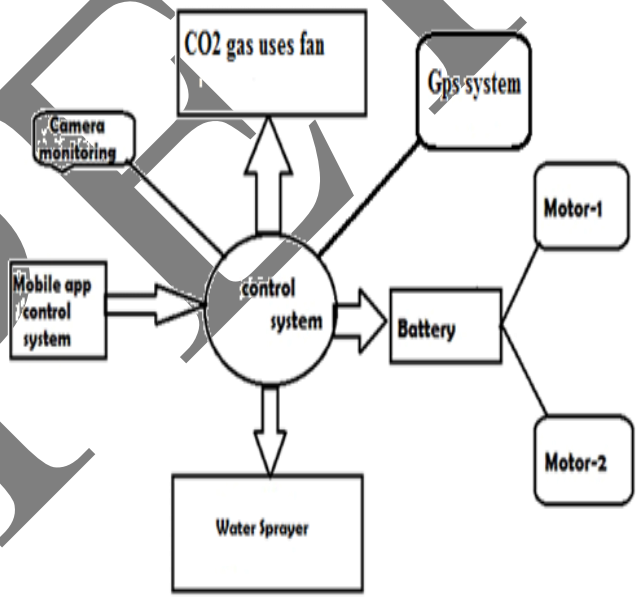

Fig.8 Mobile App Control System

IV. RESULT:

- Less cause of accident then working is carried out automatic mode.
- Requirement of human is less.
- Maintenance cost is less.
- Easily repairable.
- Improved safety.
- Protection of property from loses.
- Simple in construction[1]

V.CONCLUSION:

This paper has given progress towards achieving a future preciseness mobile app system for readying. This system is meant to support by with camera observance facility. This project plays a significant role to recharge battery to run the motor mounted with these artificial

intelligence vehicles. This renewable alternative energy supports for this project .This system can scale back labour drawback in future.

Thus, these methods are going to be the most effective replacement for presently used systems. Through this we will conclude that a golem may be employed in place of humans reducing the danger of lifetime of the firefighters. We can use them in our homes, labs, offices etc. They supply America bigger potency to find the flame and it may be extinguish before it become uncontrollable and threat to life. Hence, this golem will play a vital role in future generation.

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