

**GIT-A-THON**



**NIGHT PATROLLING ROBOTS**

**BY,**

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**NIGHT PATROLLING ROBOTS**

**DETAILED ANALYSIS OF PROBLEM STATEMENT:**

Safety in this modern world is mainly at stake and people generally don’t prefer going out in the nights for various reasons of a few are the fear of burglary, safety for the women and also the visibility concerns. Out of which safety for kids and women travelling, walking alone in the dark is the major area of concern. In a growing nation like ours it is our responsibility to take some actions for it. Although we deploy policemen it is actually tough in covering the perimeter of the nation and also human bodies require adequate amount of rest especially in nights. Therefore we are here with the solution of night patrolling robots which ticks all the boxes of our needs and also help our nation in becoming a super power.

**REASON FOR CHOOSING THE PROBLEM STATEMENT:**

The nation provides us with a sense of identity. It is our moral duty to respect our country and support it as citizens. The feeling of patriotism involves the common good of any nation. This nation belongs to all of us, and we must work towards its growth and development. The youth are often called the future of the nation. The youth of a country are the ambassadors of change and they tend to work for the world they wish to live in, so we must respect them and use the power we have to make a change and give back to this nation, which has given everything to us. Our national identity is what drives us to work for change and contribute meaningfully to society.

Since these freedom fighters fought so that we could have an identity of our own, we must contribute towards making the society a better place to live in.

Primary mission is to enhance human well-being and help meet basic and complex needs of all people, with a particular focus on those who are vulnerable, oppressed, and living in on our nation. Therefore it is our duty to do our part.

This concern is the major one in this world and doing our part for the betterment of our nation with the technology and education we learn. This leads to making significant difference in the lives of those in need.

**OUTCOME:**

Patrolling Robots are designed to help women from the dangerous situations. Women can rescue and protect themselves in any circumstances, so that she will never feel helpless at any sort locale and can protect herself even at late night. These techniques will also help police to arrest and search for the culprits. At the time of war where it can be used to collect information from the enemy terrain and monitor that information at a far secure area, and safely devise a plan for the counter-attack.Tracking locations of terrorist organizations and then plan an attack at a suitable time.Making surveillance of any disaster-affected area where human beings can’t go.

**SOLUTION PROPOSED:**

At present the perception during night ended up being particularly trying undertaking. There are a couple of spots where individuals can't be locked in with viewing. An essential of this situation is a robot which thusly distinguishes intruders in the region like working environments, home, constructing, etc and report near to board security control unit. In the current work, A late night guarding robot is made with redesigned ability to perceive and alert if there is any human development in the region to give precise watching structure. The Night Patrolling Robotic vehicle moves in an arbitrary way while viewing. The structure uses IR based way following system for watching dispensed zone. The advancement of a robot is moreover controlled thus through hindrance perceiving sensors to avoid the accident. It screens each zone to perceive any interference using camera which is mounted on the head of the robot to get the photos, record and sends them to the customer. It can similarly grant the progressing video signs to the customer. The standard objective of this endeavor is to perceive the questionable activities in the locales where human presence can't be seen.The thought behind this is to make sure about the entire region.

**METHODOLOGY:**

To structure a guarding robot, we are utilizing 4 DC engines which are adequate to make the headway of robot and the Motor driver module is utilized to deftly enough to and fro development to drive the DC engines which shields the Arduino from the harm. Robot has two Infrared sensors mounted toward the front which are utilized to recognize the little checks like rocks, leaves, and so on and travel by ruining them. To forestall the impediments in the way like divider ,tree, and so forth ultrasonic sensors are utilized. Other than the IR sensors, the PIR sensor is utilized to perceive the closeness of living article in the mechanical environment,which in this way triggers the visual sensor by then catch the picture or video and ship off client.

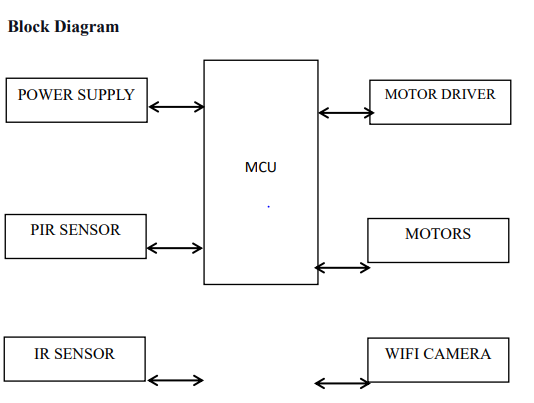
It moves in a Random way development since it has to cover the entire region. It is additionally furnished with assortment of sensors like Camera,Ultra-sonic Sensor,PIR Sensor and IR Sensors .

**TECHNOLOGY STACK:**

MATERIALS REQUIRED:

Hardware: 1.Arduino UNO, 2.IR sensors, 3.Ultra-sonic Sensors:HC SR04, 4.L293D Motor driver, 5.PIR Sensors: HC SR501, 6.DC Motors (300 RPM), 7.Robotic Chassis, 8.Cables and Connectors, 9.ESP32 Camera Module, 10.FTDI Programmer, 11.Batteries (AA) 1.5V, 12.Battery Holder.

Software: Arduino,Chrome



**PLATFORMS TO BE USED:**

The Robot is easy to make and fundamentally prudent, we needed to make it financially savvy and as we created. The essential Sensors and simple built code is entirely justifiable and even individuals having extremely fundamental programming information could fix it. The Code is in Embedded C created in Arduino IDE Software which makes itself so reduced and fundamental.

**HARDWARE:**

The underneath recorded parts are sufficient to build up the total robot. The sensors are exact the vast majority of the occasions making it precise and enchance the outcomes. Restricting the sensors to a base number makes it savvy and low force utilization. The general force utilization is separated into two sections Motors which utilize more force and Sensors which utilize low force even the Micro-regulators. The two Micro-regulators are utilized on the grounds that the camera framework ought to be made free this makes it not awkward and one don't interface with the other. The ESP32 Camera module is customized utilizing FTDI Programmer which is a USB to TTL Converter as we probably are aware this is inbuilt in the greater part of the advancement packs like Arduino and so on

The Cameras utilized in the robot are mid-range outline rate based. This restricts the expense yet goal is additionally restricted to 640x480 at great casing rate and 1280x720 at low edge rate.

**ARCHITECTURE:**

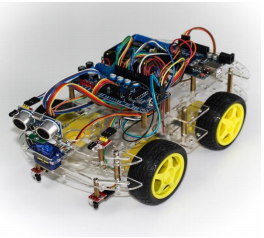
This four wheel drive permits to move over rough surfaces, conquered little snags like dried leaves and so forth The 300 RPM Motors are sufficient to move the robot in every single imaginable course, the wheels have a superior grasp at that cost. This Rigid assemblage of robot is anything but a light weight, making it to withstand wind and wait. Interfacing all the necessary sensors to the Micro-regulator exclusively with their particular codes makes this exact enough. These sensors are even operatable even evenings. All the sensors interfaced through their particular simple pins, which empowers us to get a larger number of readings than a basic computerized 0's and 1's. The batteries we use here are AA batteries which have 1.5 volts in every cell. These are utilized arrangement with one another giving 6 volts by and large. This is sufficient to control the whole framework, ideally battery-powered Alkaline AA batteries with 1.5V and 1000mAh to 2500mAh appraisals are suggested for longer use.

Fig.Model end design of the night patrolling robot

This Robot moves gradually and giving precise data of the circumstance, observed every minute of every day requiring a lesser time for supplanting the batteries. This robot is enhanced and devours less force simultaneously. This associates over a Wi-Fi network on an extraordinary IP address making itself to be recognized by the client while interfacing it. The ESP 32 Camera module is more affordable and yields better quality pictures for preparing and recognizing interlopers. This doesn't take long time however, as it is associated over Wi-Fi which makes it operatable with exceptionally less idleness than sending it over a cloud or over GPRS. This Module creates pictures or recordings with great goals. Or maybe utilizing a Raspberry pi board, this is less muddled to work and could be worked even with exceptionally less programming information. With restricted Wi-Fi range it doesn't leave the premises at any rate. Utilizing Machine learning the robot distinguishes the new faces which are not enlisted, catches their pictures immediately and ships off the client.

**UNIQUE SELLING PROPOSITION:**

Our project would be a potential game changer because:

India ranks 133rd in the recently released Women, Peace, and Security Index. The new global Women, Peace, and Security Index incorporates three basic dimensions of well- being—inclusion (economic, social, political); justice (formal laws and informal discrimination); and security (at the family, community, and societal levels)—and captures and quantifies them through 11 indicators and India hasn’t performed well in any of the three categories of Inclusion, Security, and Justice.

Therefore large part of this safety,security have to be taken care in the dark skies which goes missing in our nation.With our project it would be of great help to the society and also for the betterment of our nation.This could be stepping stones for many safety,security devices to come. It almost solves all the aspects and the project is one of its kind so a new device for the safety patrol which gives human’s their much needed break in the nights and helps covering all terrains of the country.

47% of Indian women find sexual harassment a topmost issue on the nation. Harassment includes stalking, staring, verbal and physical attacks. Most of these actions go unreported, due to the passive aggressive nature of these crimes. Nevertheless, unreported does not mean unnoticed. It not only builds an unhealthy and stressful life .This patrolling bots could be the solution for this long prolonging problem

Whole project is unique in itself so this is the need of the hour for citizen’s safety.

**TARGETED AUDIENCE/MARKETING STRATEGY:**

Audience of our project will of course be our nation’s citizens. As its mainly designed for a social cause. There’s no marketing strategy to it. Only way is to approach the government officials and organize various workshops,webinars,presentations for them to understand and develop the prototype into a fully functional model.

Testing phases to be undergone to targeting the government and audiemce for it to be a realisitic solution.

Field experiments, especially those conducted far from home, can provide an ensemble of opportunities and risks. When experiments take place in exotic locations, or have high overhead, there may be limited opportunities for the kind iteration and repeatability required for perfect quantitative evaluation. Nevertheless, there are different classes of field tests that enable scientific progress.

Here we list a few.

• quantification of performance: the gold standard for scientific progress is quantitative performance evaluation with certainty bounds, but these can be very hard to achieve especially in the face of environmental variability.

• feasibility/competence verification: in very challenging environments, or with sufficiently novel designs, simply proving an approach works can be sufficient.

• Enumeration of failure modes: a parallel of basic validation is an enumeration of how failures occur and performance factors, which can be used to spur further research.

• User satisfaction/capability assessment: in addition to the measurement and quantification of performance on task metrics, the extent to which a system is satisfactory to a user population, or can be configured, provides an alternative and important aspect of evaluation.

• Discovery of failed/poor assumptions: associate with basic validation is the identification of the underlying causes of any under-performance, and the physical factors responsible.

The gold standard of for scientific and engineering progress is the acquisition of repeatable quantifiable performance metrics that explain how well an approach works, and be be used for further analysis. Ideally, a single evaluation scenario should be repeated sufficiently to obtain confidence bounds, and starting conditions should be varied to identify the impact of the initialization.