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# **Android Based Autonomous Intelligent Pod for Border Security Using Raspberry Pi**

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**ABSTRACT:** Intruders cross our borders unknowingly. Each and every moment of the intruders cannot be watched by our soldiers near the border areas. Using this Autonomous Intelligent Robotic system, it provides remote surveillance using a security robot. Using PIR motion sensor, this Autonomous Intelligent POD alerts security personnel by identifying Intruder, capturing image of the Intruder using camera in Android device and mails this image to the specified e-mail id using Android based application.

**KEY WORDS:** PIR motion sensor, Android, Autonomous Robot, Raspberry Pi.

## **I. INTRODUCTION**

The Indian border military force is facing a huge destruction from Pakistan, China, Myanmar, Sri-lanka and Bangladesh.

Highly trained militants are on essentially suicide missions – died in the three-hour assault on the base at Uri.

If this situation continues, then there's going to be a massive destruction in Indian border line force.

Almost all the military organizations take the assistance of military robots to hold several risky jobs that can't be handled manually by soldier.

We have also seen a great development in military robots when compared to military robots in earlier period.

At present, totally different military robots are utilized by several military organizations.

This innovative system is formed for operations that involve high risk for humans to enter and will be tried terribly helpful for military space for spying functions.

This system makes use of robotic vehicle which helps not only to enter an area involving high risk. The whole system is controlled via android application. Thus, this application involves robotic vehicle so that the system can be used to enter a high-risk area, move around place wherever it wants to.

## **II. RELATED SURVEY**

Robot arms, or manipulators, comprise a two-billion-dollar trade. Bolted at its shoulder to a particular position within the production line, the golem arm will move with nice speed and accuracy to perform repetitive tasks like spot welding and painting. In the industry, manipulators place surface-mounted parts with herculean preciseness, creating the transportable phone and notebook computer attainable. Yet, for all of their successes, these industrial robots suffer from an elementary disadvantage: lack of quality. A fixed manipulator incorporates a restricted vary of motion that depends on wherever it's secured down.[1]

One crucial application of intelligent golemic systems is remote police investigation employing a security robot .A fundamental need in security is the ability to automatically verify an intruder into a secure or restricted area, to alert remote security personnel, and then to enable them to track the intruder. In this article, we tend to propose AN Internet-based security golem system.

The face recognition approach possesses "invariant" recognition characteristics, as well as face recognition wherever facial expressions, viewing views, three-dimensional poses, individual appearance, and lighting vary and occluding structures are present. The experiment uses a thirty-three.6-kb/s modem Internet connection to successfully remotely control a mobile robot, proving that the streaming technology-based approach greatly improves the "sensitivity" of



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robot teleoperation. This improvement ensures that security personnel will effectively and at low value use the web to remotely management a mobile golem to trace and establish a possible unwelcome person.[2]

Most traditional home robots have always had problems with stairs, doorsills and other obstacles that humans cross with ease in cluttered indoor environments.

This paper presents the event and characterization of a police work mechanism with hopping capabilities for home security. The projected mechanism, which is 9 cm in height and 250 g in weight, can leap over obstacles more than 4 times its own size. It depends on the elastic components in an exceedingly six-bar linkage leg system to alter hopping locomotion.

It may also roll freely on flat floors and alter its directions by the machine differential drive system. It adopts the ZigBee protocol for wireless communication and so is additional to a ZigBee-based home management network as a mobile video device node.

Experimental results verify that the paradigm mechanism may be a powerful home security device that may patrol in littered home environments with ease.[3]

The mobile phone landscape changed last year with the introduction of smart phones running Android, a platform marketed by Google. Android phones area unit the primary credible threat to the iPhone market. Not solely did Google target a similar customer as iPhone, it additionally aimed to win the hearts and minds of mobile application developers.

On the premise of market share and therefore the range of accessible apps, robot could be a success.[4]

Mobile application processors are soon to replace desktop processors because the focus of innovation in chip technology. Already, these processors have largely caught up to their more power-hungry cousins, supporting out-of-order execution and multicore process. In the near future, the exponentially worsening downside of dark Si goes to be the first force that dictates the evolution of these designs. In recent work, we've got argued that the natural evolution of mobile application processors is to use this dark Si to make many mechanically generated energy-saving cores, called conservation cores, which can reduce energy consumption by an order of magnitude. This article describes GreenDroid, a ground workmodel that demonstrates the utilization of such cores to save energy broadly across the hotspots in the Android mobile phone software stack.[5]

In this paper, a survey is being conducted on the investigation of a four-class taxonomy associated with security robots that appeared over the past 3 decades. The survey emphasizes on progressive mobile technologies that are developed for crime-fighting robots, capable of crafting essential things with confrontation methods. Throughout this investigation, sixty comes are being examined with relevance schools and sensing element equipment getting used.

An applied mathematics analysis, that is carried on the historical developments of the foremost enticing frameworks, reveals the recognition of the four security automaton classes and their written account progress over the past 30 years.

The classes being evaluated regard teleoperated, distributed, police investigation, and law-enforcement automaton architectures. In the survey, a shot is formed to clarify the importance of intelligent methodologies, and their aborning effects in security tasks. The major findings of this analysis illustrate the minor contribution of intelligent architectures in crime-fighting robots, and what constitutes an intelligent security robot.[6]

### III. PROPOSED METHOD

The design and development of the proposed system is discussed here.

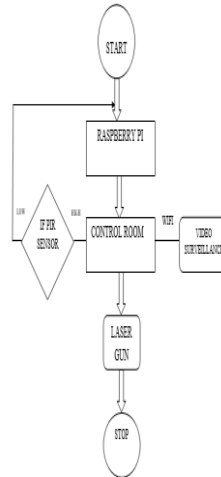
Android Application:

Application mainly includes two modules:

Camera: The mailing module is invoked by the camera application which captures the images of the intruder through android operating system and saves it into the memory.

Mail: The mail is sent to the preconfigured mail id with preconfigured text content which has the last updated image.

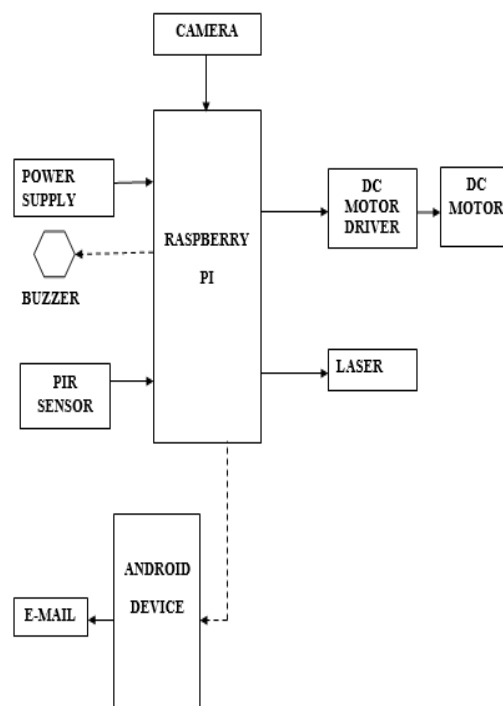
**Flow Chart:**



**Figure 1.**Flow Chart showing sequence of operations.

PIR motion sensor is connected to one of the pins on the input port of raspberry pi and depending on sensor signal status; when it is high, raspberry pi sends the control signal to android device in order to send e-mail. After the reception of the e-mail application in the android mobile gets activated which in turns takes the image of the intruder and upload that image to pre-specified email id.

**Experimental Procedure:**



**Figure 2.** Block diagram of POD



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Basic principle of the system is waiting for the reflected signal from the intruder. To rotate the POD, DC motor is used. Two-gear DC motor is used for the movement of POD. The movement of pod is enabled by our mobilephone. Here we are using an android device for controlling the movement of POD and the Raspberry Pi camera for video surveillance. Then a PIR sensor is used for detecting the trespasser.

The sensing element is activated 40secs once the activation of the device, as it wants to cope up with the surroundings. If an intruder is detected, the output of PIR sensor is being sent to the Raspberry Pi and then the Wi-Fi module in the Raspberry Pi sends an information signal to the control room. If associate unwelcome person is detected an optical device gun is provided for more functions. The movement of optical device is controlled as per the directions given by the room. If necessary, laser gun can be used for shooting or firing the intruder

## IV. CONCLUSION

There aren't any gift security strategies to safeguard our borders thus implementation of android-based golem for border security may well be a lot of useful. It reduces human involvement in the borders. This method reduces the risk in the lives of our soldiers. PIR device is employed to trace motion of entrant and camera for video police investigation. Alert message is being sent to the control room, and the provision for firing is passed on. This system provides a lot of security and reducing the danger of troopers. A Security interface is obtained to humanoid mobile device. This is a short-range system and may be extended to long vary by selecting correct PIR motion device and it's easy in its operation. The range and security features were achieved through the use of the internet in the mobile device. The system was able to send e-mail to specified number of the security personnel and to the android mobile which is on the robot when PIR motion sensor detects intruder.

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