The Explorer- A Multifunctional Bot

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Abstract— From intelligent home robots which are used for home safety to exploration robots used to enter the environments that are injurious for human beings, robots are very useful for mankind. This usefulness of a robot gives rise to a need for a multifunctional robot which can incorporate different emerging technologies in order to be used for several applications. Instead of using different robots for different applications, the Explorer Bot is a multifunctional bot which incorporates technologies like Artificial Intelligence, Internet of Things etc.

Index Terms— artificial intelligence, bluetooth, internet of things, solar, taser, virtual reality, wifi

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1 INTRODUCTION

SINCE the advent of robots, the work has been shared between man and machine. Their intelligence, quickness and precision helps them do things which are difficult for human beings. But instead of using different robots for different application it would be beneficial to have a single multifunctional device. The bot should be built in such a way that it should provide maximum efficiency and minimum cost. The Explorer bot can be the solution for this! The Explorer bot is a self defending robot which can be used for gaining information, observation purposes, security purposes, entertainment purposes etc.

The Explorer bot consists of various concepts:
1. It consists of an assistant which can be used to gain information from the internet and can be used to trigger the defense mechanism when needed.
2. It consists of a defense mechanism through which the bot could protect itself from abnormal situations.
3. It consists of a camera interfaced to the bot so that it can be used for surveillance processes.
4. It consists of a VR headset interfaced to the bot so that it could be used for gaming purposes.

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2 LITERATURE REVIEW

A literature review was done in order to understand certain concepts incorporated in the project.

A paper written by V.Kasinathan, et.al, states that the Intelligent Healthcare Chatterbot is a expert system which takes input from the user in this case a patient in the form of text messages, extracts the keyword and assigns the users queries to the higher departments. The inputs received in the form of texts are used for detecting and diagnosing a particular disease using a natural language interface of chatterbot.[1]

A paper by Kang Hung Lee, et.al, states that a mobile robot is for collecting environmental information and can perform 2 types of features:
1 When the user is not present the robots activates its security and safety features.
2 But when the user is present it plays games with it.[2]

A paper by Paul Dempsey, states that the virtual reality has been profuse in the gaming industry since the Sega's Master System 3D glasses have come into the picture but the best is however yet to come.[3]

A paper by P.Yagdevi, et.al states that home automation has now become a trend due to Internet of things. Iot being a emerging technology has helped the people to personalize their belongings using Bluetooth or android systems. The automated device can then be controlled from certain distance.[4]

A paper by Feng Rong, et.al, states that Artificial Intelligence can be used for building a tourism management system which would help the tourists to plan their travel routes. The tourism management system consists of Information organization and filtering modules & content module.[5]

A paper by Shopan Dey, et.al, states that due to growth in the technology these days has made the life of a human much more simpler then it was in the olden days. Nowadays by using the concept of Iot using smart phone & computer one can connect over the internet in order to control their home appliances remotely.[6]

3 CONSTRUCTION AND WORKING

The components used are:
1. Lithium-ion battery.
2. ESP 8266 NodeMCU.
3. VR Headset.
4. Voltage
5. Regulator.
6. Arc Generator.
7. Camera.
8. Arduino.
9. Chassis.
10. Motors.
11. Motor Shield.
12. Tyres.
13. Solar panel.
14. Lead Acid Battery

The bot consists of a defence mechanism that is triggered on a set of commands given by a user. The commanding is done using ESP8266 NodeMCU. This controller can be accessed remotely through voice commands. For voice commands, the user connects to Hannah, the Ai assistant. A set of commands are given to turn on and off the Tasers. These commands go to Heroku which further transfers these requests to ESP8266 to take necessary actions. The ESP8266 can also be controlled using an app installed on the user's phone.

The defence mechanism is basically controlled over the internet using a Wi-Fi module. The defence mechanism includes a Taser made by using an arc generator. This arc generator is used as a voltage multiplier to give out a tremendous shock. The bot's movements are controlled over Bluetooth. It consists of 2 cameras that are used to provide a live footage of its surroundings. A night vision is used so as to operate the machine in dark places or at night. A VR headset can be used to output the video signal. Video signals can also be viewed on other devices.

Lithium-ion battery is used to fire up the Tasers whereas Lead acid is used to power up the bot. The bot is incorporated with a solar panel so as to charge the batteries to some extent.

4 CONCLUSION

We created our bot which is controlled by Bluetooth which is more secure as compared to Wi-Fi. We created our AI named Hannah. The defence mechanism is controlled though Wi-Fi. Although it is not secured but is fast as compared to Bluetooth, and thus to trigger defence mechanisms as soon as possible, we use Wi- Fi. In comparison with the robots seen in literature suvey, the Explorer bot is advantageous as it is a multifunctional bot and can be used in several applications. We learned how to program ESP8266 NodeMCU and create apps for the same. The project is useful in places where human intervention may not be possible. The bot can easily sneak into places without grabbing much attention and perform the tasks assigned. The defences attached to it are used to protect itself from any possible threat.

5 FUTURE SCOPE

1. The project can further be improved by adding features like bomb detection and diffusion.
2. Taser can be tweaked to use it as an EMP blaster which can be used to disrupt electronic devices.
3. Ultrasonic sensors to measure the depth to keep it from falling in a pit and also to calculate the distance from target.
4. Various sensors so as to keep a track on weather conditions.
5. Hannah can be upgraded to collect information of the surrounding and look for any possible threats.
6. The bot can also be modified for gaming purposes.

6 ACKNOWLEDGMENT

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