



ulti Function War Assistant Robot System Using Machine Learning Algorithm

M Abhishek, K M Anusha, C P Indra, S Dhananjay and
B S Rajeshwari

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Abhishek M
Dept. of CSE
B.M.S College of Engineering
Bangalore, India
abhishek.cs18@bmsce.ac.in

Anusha K M
Dept. of CSE
B.M.S College of Engineering
Bangalore, India
anushak.cs18@bmsce.ac.in

Indra C P
Dept. of CSE
B.M.S College of Engineering
Bangalore, India
indra.cs18@bmsce.ac.in

Dhananjay S
Dept. of CSE
B.M.S College of Engineering
Bangalore, India
dhananjays.cs17@bmsce.ac.in

Rajeshwari B S
Assistant Professor
Dept. of CSE
B.M.S College of Engineering
Bangalore, India
rajeshwari.cse@bmsce.ac.in

ABSTRACT

The main aim of military robot is to follow some rules and regulations of the robotic system. This robot is artificial intelligent as well as hydropower machine controlled by computer system. It is developed and design to replace mankind in numerous dangerous fields. War robots are used to find explosive, weapon, fire and gas etc. The main advantages of these robots is the amount of time that robot operate is fraction to the amount of workers needed to perform the same function. Along with this, they are modified and integrate the different modules and perform the operations with a high accuracy. This paper summarizes techniques and proposed a framework for Internet of Things (IOT) based war assistant system.

Keywords - Military robot; Artificial Intelligent; Internet of Things; Machine Learning.

1. INTRODUCTION

Robotics has become a staple of advanced manufacturing for over a half a century. As robotics and their major tools become more dependable, durable and reducible, such type of systems are developing more and used in the war fields, enjoyment and observation purposes. These types of system are mainly control through wireless technology and various sensors are used to detect the harmful to the environment. Sensors like mq2, mq3, mq6, temperature, humidity, sunlight are the parameters used to predict the harm ness of the gas or smoke with the help of machine algorithms like a Logistics Regression and K-Nearest Neighbor (KNN). These type of detecting smoke known as gas detector, smell detector.

Robots are used to replace humans in the war fields. E-Nose technology is used to detect the harm full gases in the war zone area, alert the admin of the military if any suspicious things is happening in the war field. Also, to capture all the images and video through camera.

2. LITERATURE SURVEY

Sarmad Hameed et al., [1] has developed system for the purpose of attacking, defense and for inspection. The authors developed a technique for surveillance to find intruders or detect intruders. The developed robot can traverse or can control wirelessly. Also, the authors mentioned on radio frequency waves for communication and controlling purpose and can monitor the robot wirelessly using the radio frequency waves. The proposed system uses various sensor like motion detection sensor for detecting movements around that area and they used global positioning system to detect or used to track the location of incident.

E.Kanniga et al., [2] developed the robot system to replace the human that can trace out the enemy with the hand gestures and can trace the bomb with the help of artificial intelligence. The developed robot system can be controlled with the help of hand gestures or hand movements. This system is making use of RSSI instead of GSM for better security purpose and uses MEMS instead of biological sensor. The developed system uses night vision camera, to increase the efficiency of

the robots during night time. Artificial intelligence is used to detect the fire obstacle , bomb detection , MEMS data collection and pc interface with the embedded cautions.

Shweta Vichare et al., [3] developed the multifunctional robot for military application and this robot consist of wireless network like Zigbee technology, Wi-Fi technology for communication purpose. The developed multifunctional robot system uses camera for controlling and monitoring the robot and uses DC motor for robot movement. Also, the robot system uses laser gun for shooting and the ultrasonic sensor for detecting vehicles. The developed multifunctional war robot can be used for surveillance purpose and attacking purpose.

Vidya Palve et al., [4] This author developed the multifunctional robot for military application the main purpose beyond developing this robot is for watching or observing a human activities in the war field or frontier regions in order to decrease the attack from the enemy side. The robot consists of dark visualization and also it consists of wireless camera which can transmit videos and capture the photos in the war field in order to prevent any harm and loss to human life. The robot will work as an suitable machine in the military sector to reduce the losses of human life and will also prevent illegitimate activities.

This robot consist of wireless network like zigbee technology Wi-Fi technology for communication purpose and they used camera for controlling monitoring the robot and they used dc motor for robot movement and they used various gas sensor for detect to hazardous gas and they used metal sensor to detect bombs and overall this is also multifunctional war robot .

Diclehan Karakaya et al., [5] proposed the “Electronic Nose” for detecting the hazardous gases and predicting the harmness of the hazardous gases. The proposed system uses the various chemical sensors for detecting the hazardous gases and the machine learning algorithms to predict the harmness of the hazardous gases. The author described that the proposed system can be used for number of applications: commercial or business production processes like manufacturing products, medica purpose and in hospitality, analytical chemistry and biomedical industries. Electronic Nose application can also be used to check the freshness and ripeness monitoring of fruit, for detection of explosives and also in various transportation for people’s safety purpose and private security purpose.

Tarunpreet Kaur et al.,[6] developed the multipurpose security robot for military service and they used various sensors like temperature, humidity and fire sensors for measure the temperature and humidity for environment checks and they used chemical sensor for detect hazardous gas and they used wireless camera for surveillance. They built strong robot it can traverse or run in the tough road like mud road it can be easily traverse or move without hesitation of road or mud and it can traverse in forest field.

K. Damodhar et al., [7] developed military robot for real time controlling and apprehend the images or videos through live. The developed robot can be used for inspection and can check for any intruders. The developed system can be accessed remotely through mobile phones and also can connected and controlled through the mobile phone. Authors described that the designed robot system can store the images and captured videos for enquiry purpose which helps to analyze and detect the intruders.

M.Karthikeya et al., [8] designed a system for the purpose of attacking, defense and for inspection. In the paper, the authors described that the system is designed for surveillance to find intruders or detect intruders and the robot can traverse or can control wirelessly. The robot system is designed using various sensors like motion detection sensor for detecting movements around that area, global positioning system to detect or to track the location.

Deepak patil., [9] described about the military robots used in war environment which decreases the cost of defense system and increases the save lives. The main thought is to plan for the detecting metal bombs, permit the user to control it remotely to keep away from human dangerous. Armed military robots are already presented in the form of self-governing drones, weapons and robots, but require the lots self-detecting and intelligently taking decision to manage dangerous circumstances.

Xiao Liu et al., [10] discussed that detection of gas technology has been widely used by sensing technology and investigator have been working on a various real time scenarios to enhance various sensor collaboration. In this current technology, they adopt different techniques and classified those gases based on electrical and other properties. The paper is mainly focused on discussion on the effects of gas and comparisons between various sensing technology.

Piscataway N J .,[11] developed military robots for minimizing the risk of the human life's and to beat the enemies. With the help of current technology, robots can replace the high-tech weapons or machinery which are being used in war field. Authors discussed that robots are one of the common things in this era in which the different countries and worldwide are interesting upon for developing the military purpose robots in the state of war and peace. Some of the robot systems have been in use for some detecting the land mines and rescue operations for injured peoples in war field, but still research work is going towards monitoring and surveillance. Authors described different types of robots are used for different purpose ranging from bomb detection, spy, transportation and saving human lives in the war field

Vaibhavi Wanjari et al., [12] developed IOT robot, which moves from one location to another location by thinking and analyzing the current environment circumstances. The designed IOT robot will detect humans and animals' motion, and sends the location. Also, it detects metal bombs etc. The developed robot can be used to monitor in real-time and to access the available data concurrently using some IOT protocols. The developed system is able to send the data and receive the data and will predict the information such as location and environment condition.

Aniket.A.More., [13]These author developed the surveillance robot for real time monitoring and capturing the images or videos. In the proposed system the wired Robot can detect the metallic object and also it captures Live Video or image and detects the hazardous gas or smoke. The robot is adaptable in the environment where humans cannot enter. It also can detect motion in any unstructured environment and uses various sensors like chemical sensors to detect hazardous gas in the environment.

Stuart young,[14] developed the small micro-scale robots for military purpose. The developed robot comes up with the self-governing or autonomous robot where they control themselves and can be used for spy purpose. Also, the robot can be controlled manually. The robot is designed with the various sensors and other IOT components which can travel from one place to another place. The author mentioned that the developed robot is small compared to other robots and can be used only for spying purpose and surveillance.

Mohammad Monirujjaman Khan., [15] discussed that Liquefied Petroleum Gas (LPG) is a main source of fuel, mainly in metropolitan areas it is good compared to lightwood and charcoal. LPG gas Leackageing is a main problem in the manufacturing industry's areas, Buildings,in vehicals ,apartment premises, etc. In recent days, house and industry security has become a major problem due to increase of gasoline leakage. Gas leakage is one of the great worry with ateliers, residential fields and vehicles like Compressed Natural Gas (CNG), buses, and cars which are run on gas power. A vehicle which includes a CNG has to taken the protective methods to avoid accidents in the vehicle by installing the gas leackge detection system.The main aim of these paper is to design a gas leakage detection system that can automatically detects the leackge, alert and control gas leakage. This detecting system also includes an notify system for the users. The system is designed based on using a different sensor that easily detects a gas leakage.

3. PROPOSED MULTI-FUNCTION WAR ASSISTANT ROBOT SYSTEM

The proposed Multi-Function War Assistant Robot system (MFWR) consists of automated modules which accomplish the following functions:

- The module is developed for replacing human beings in various dangerous areas. Also, these robots will identify the bombs and various gases in the war field.
- The module which easily detects the possible of the outcome dangerous gases in the environment and with the help of machine learning algorithms and technology can automatically predicts the harmness of the gases.

Block diagram

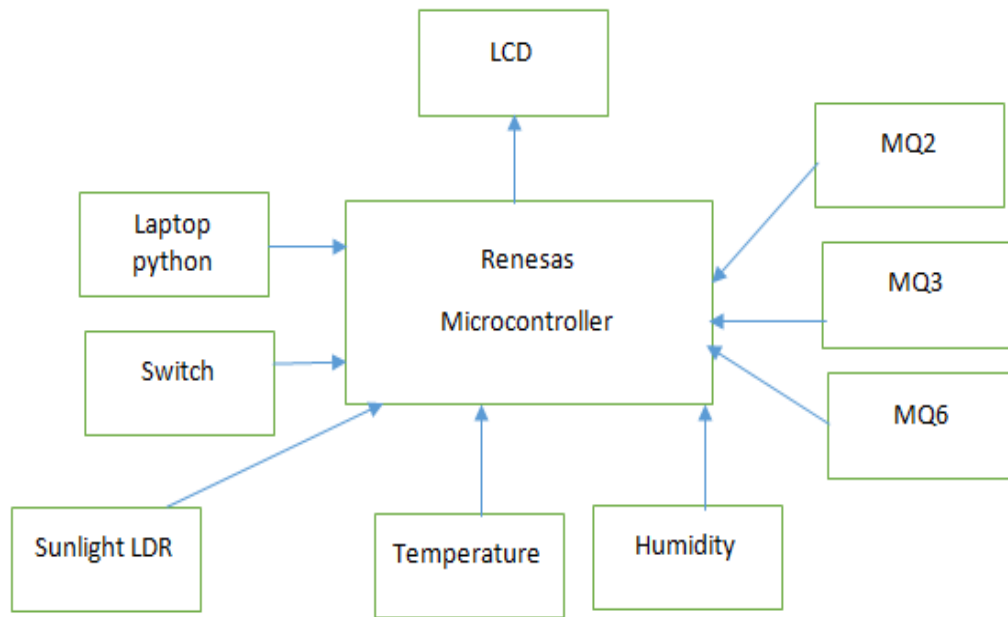


Figure 1: MFWR System Architecture

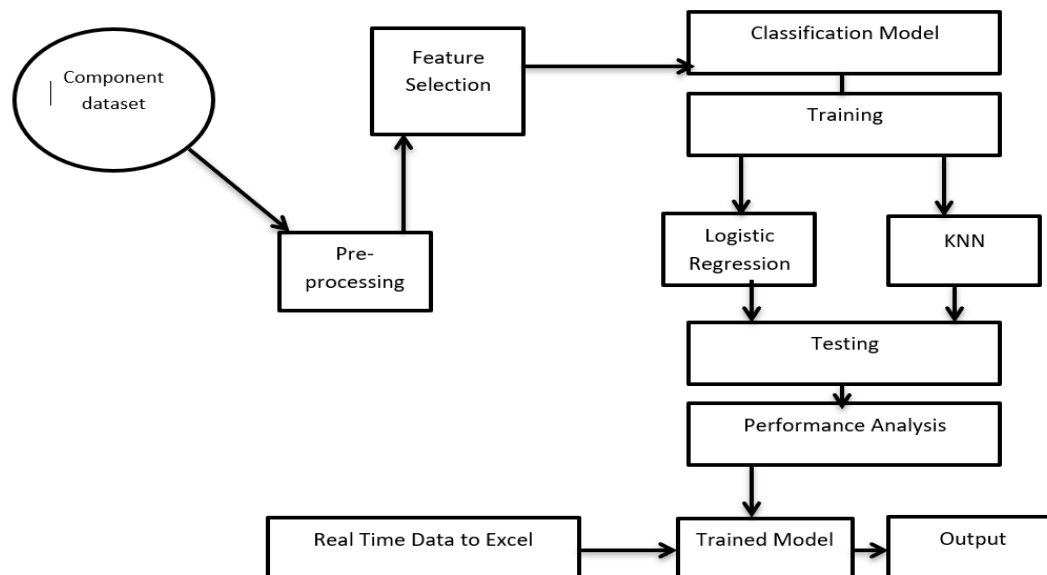


Figure 2: Modules of MFWR System

Logistic regression is one of the machine learning algorithm and supervised learning classification algorithm used to predict the harness of the gas first it will categorize the all the values and then It will compare with the trained with real-time data.

K-Nearest Neighbour (KNN): In statistics, the k-nearest neighbor's algorithm is a nonparametric classification model. It is used for classification and regression. In both cases, the input consists of the k closest training examples in data set . The KNN also called as a lazy learner's algorithm.

Feature selection: The features which contribute more to the prediction of the output are selected from the given set of features computationally using feature extraction algorithms. Various feature selection techniques or algorithms are there which have been used in the past. Feature selection will reduce the number of features required for prediction.

4. EXPERIMENTAL SETUP

This section gives the brief introduction about the setup that was used for experimentation to run the project. Python language is used for implementation of algorithm and the proposed system used Logistic Regression and KNN(K-Nearest Neighbour) for prediction. CubeSuit ++ is used for development and integration of hardware. The result is produced based on the data from the hardware and predict the harmness of the gas using the logistic regression and KNN algorithms.

5. RESULT AND DISCUSSION

This section discusses the performance of the developed framework. The potent of developed model is evaluated under logistic regression and KNN algorithms and the results are compared.

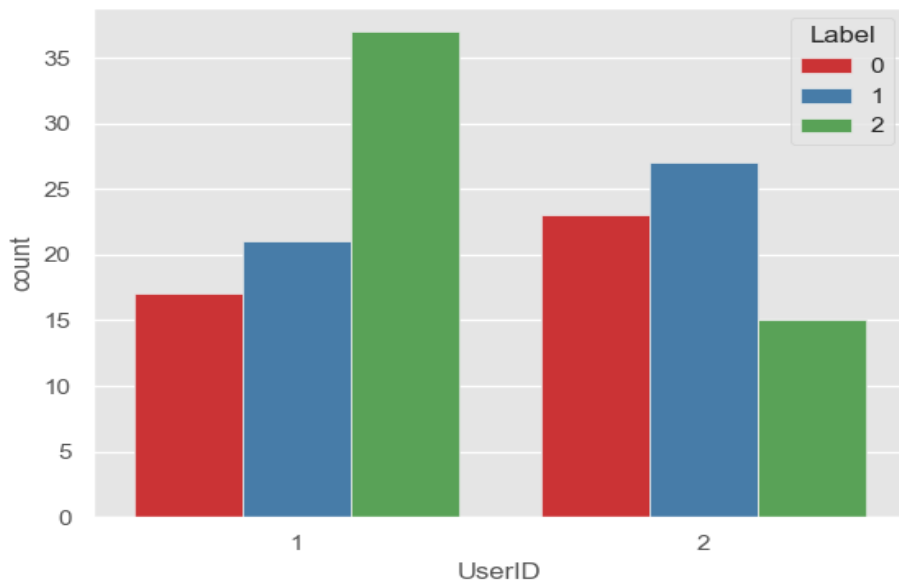


Figure 3: Categories of harmness level at different locations using proposed MFWR system at the war field .

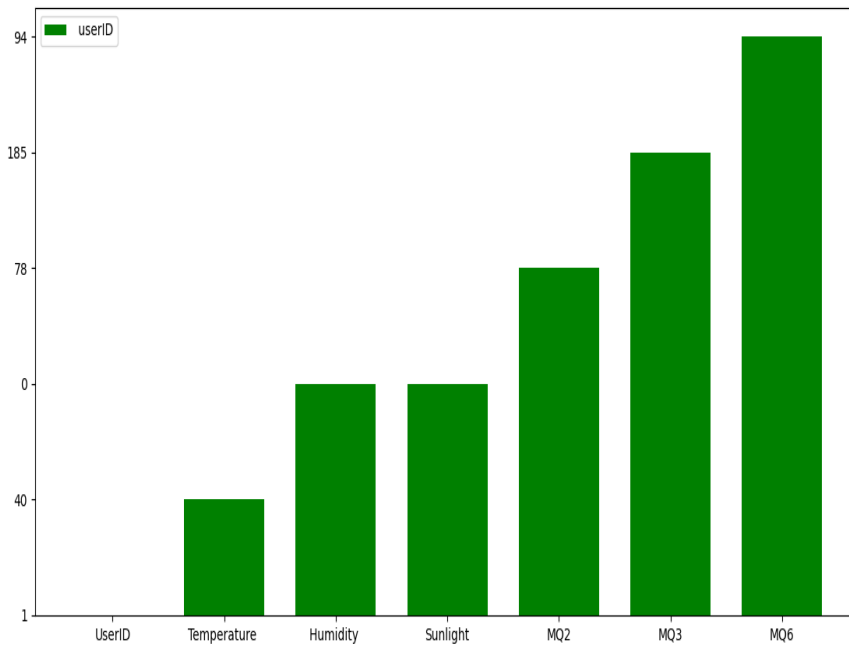


Figure 4: various parameters without using machine learning algorithm at the war field

The figure 4 represents the graph without using any algorithm. If we didn't use any algorithm we were not able to predict the harm ness of a gas. The above figure 4 graph shows only the collected data range. For Example consider a variable temperature where it shows only the data range similarly for every variable. It does not consider every variable for predicting the harm ness. Hence without using any algorithm we cannot predict the harm ness of gas. But the figure 3 represents the effectiveness of proposed framework. Here the proposed system used machine learning algorithms like a logistic regression and KNN to predict the harmness of the gas in the war field. Where have two different locations called userid means different location ID on the harmness in the war field. It is predicting the output the result shows like a Label 0 represent the low level harmness, Label 1 represent the medium level harmness and Label 2 represent the high level harmness. Based on the label value we can take the necessary action in the war field.

CONCLUSION

There has been a huge development in the robotics, today every country needs defense robot which plays an important role in the war fields. It is said that defense robot automation will be the next wave in the robotic evolution.

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