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Exam Controller Robot

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***Abstract*: In this paper, we have proposed a line follower mobile robot as an examination controller which will detect and follow a linear path drawn on the floor. We have made use of Infrared Sensors (IR) for the robot to sense the line present in the room and avoid the obstacles in case the path is undefined or unknown environment. The line can be invisible or it can be a darker color on a white floor. The processor decides the commands for the robots and passes it to the driver for the robot to follow the path. This system presents an image processing unit to detect the students using unfair means in the examination. These robots communicate with the data owner over a Wireless Sensor Network (WSN). Robot will live stream the video of examination hall to the data owner. The owner will monitor the robot over a wireless sensor net-work and will detect any actions of the robot through the live feed.**

***Keywords*: Image Recognition, video streaming, WSN, Self-Controlled robot**

1. Introduction

Cheating and academic dishonesty has always been a disturbing practice in an academic setting; it kills the creativity of a student. Research shows that the rate of cheating is in-creasing day by day. To overcome this type of problem we use highly trained device called "ROBOT". We are making this project for controlling cheating in exams. There is a camera which is attached on top of robot. That camera cap-tures the movement of student. It has two condition. One condition is If the movement is normal and there is no noise sound of cheating then it detects that cheating is not going on. And in second condition if movement is normal and there is also detection of sound of cheating then it detects that cheating is going on.

This project has the huge use of the IOT. Since the device get connect through the single network. To communicate with the sensor and another device there is lot use of IOT technology. Now a day Building IOT system is also challenging for the develop since this type of the System Have control over the command as well voice of the human. Command given to the Connected device via various source like Using mobile phone and having lot of application that will help the connected system to communicate each other. Another way to giving command is providing the sensing of This System also work on the image processing and speech recognition. The main aim of this project is that it should detect the human movement and the noise produce inside the hall. The movement inside the exam hall is strictly forbidden so this is important to capture this thing inside the hall. If the movement is going on, then there should might be the chances that student gets communicated with each other which is not allow in the exam hall. Another thing is that speech recognition which is also the environment. It should detect the environment and work as required. Restricted in-side the hall. If noise is produces means they start talking to each other.

We highlighted the movement of the robot itself. There is two possible way that the robot moves from location A to B. one way by following the line and another way is to avoiding the obstacle in front of it. We are using both the concept in this project to turn from the particular location. Obstacle avoid is used for avoiding the accident with the desk and bench in-side the class room. There is quite use of the sensor like ultra violet sensor and IR sensor to avoid this thing.

Image processing is done by providing various dataset about the supplements and the answer sheet image which will easily detect it. If the page is found either than supplement or answer sheet it should have notified to the controller and mark the location in message given to the controller. To handle this all thing, it should have processor so in this project there is processor is used in the form of the raspberry pi and the Arduino board which can easily setup and can be implement such complex project. Many sensors are compatible with both raspberry pi and Arduino and it should easily communicate with each other via Bluetooth or via Wi-Fi.

While streaming a video to the controller it should takes action that it can only send to those who have proper IP ad-dress and connect to the same network. In this project Ma-chine learning is used in every step from the movement to identify the object. It all covers the machine learning of the system. This whole system work on the supervised learning.

2. System Architecture

This project has to organized to detect the human behaviors. This Project consist of the modules and algorithm which will provide the interaction with human and the robot.

This robot is self-controlled and line follower as per the environment provided to the robot.

These are some modules which will combine to make this novel robot.

A. Robot

Robot is the system which is used to detect the student who is cheating in the examination hall and also detect the

movement of student. The movement of the student can be trained from the IXMAS dataset.

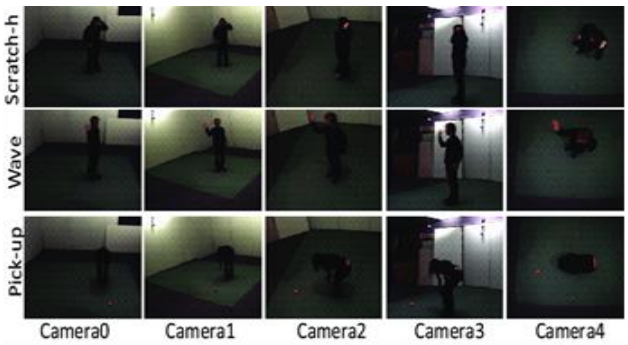

Fig. 1. Action capturing dataset in IXMAS dataset

B. Student

Student is the live module which was detected by the robot. Students have their IDs and the allocation of the class for exam and the robot are trained to detect the students whom belong to that class. This Module is the interaction of the training datasets and also fetches it from the cluster of the student.

C. Server

It is used to store the record of the student not the data but it stores the student Image which will interact with the training data. Image are cluster in server and the student should be identified and assign the belongs clusters of the same student.

Clustering of the dataset should be done on the basis of which student are assign the class room. The objective how the system is going to know about the students for the clustering this should be done via the seating arrangement system of particular pattern.

Exam controller are done it through uploading the seating arrangement on the server and identify the student seat number. Seat number are the unique of each student so it can be used in the clustering of the student according to the seat number.

D. Creating Dataset

Fig. 2. Dataset of student

Creating a dataset is not a large or tedious work. It should be done easily by using of library available. One of the most popular and one of my favorite library available is opencv which provide the capturing the image and perform lot of actions like converting in gray scale, capturing the movement of the obstacle and many more. In this project opencv is used to create dataset which was converted into the gray scale and the naming format is done such a way that image name contains seat number name and image number as shown below (Seatnumber.NameofStudent.imageNumber.jpeg)
B12345.rakesh.1.jpeg

E. Image Recognition

Image Recognition is the step from which the system de-tects the image and identify image from the cluster. The output of the System is such design that they are display the name and belonging to the class the image shows the identification of the images.

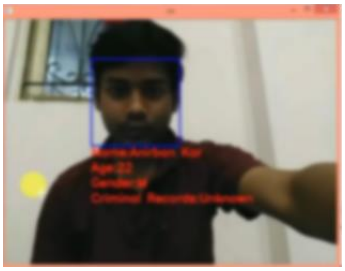

Fig. 3. Image Processing Output

F. Sensor and actuator

Sensors are the eyes and nose of the robots which will help them to interact with the environment. In this paper we use the sensors like IR and Ultrasonic sensor for the movement of the robot in known and unknown environment. Actuators are the device which is used to take output from the robots. Output depends upon robot functions, power, speed and precision.

G. Movement algorithm

By using of IR sensor we will achieve to movement of the robot but the challenge is arrived when you want to deployed the robot on unknown environment.

The common algorithm that is used in the field of the robotics for the movement of the robot is bug2 algorithms.

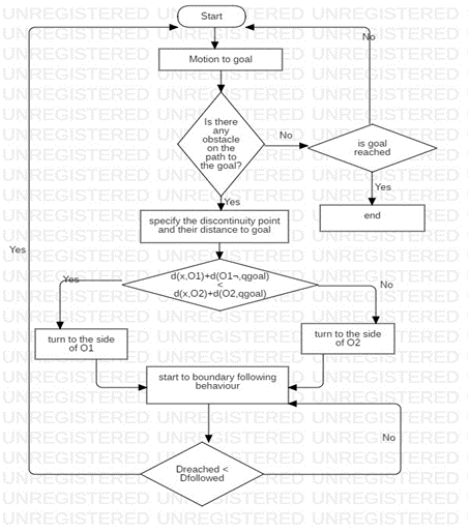

Fig. 4. Flowchart of bug2 algorithm

H. Processor

Processors are the main core from which entire system can be controlled. Here we used the raspberry pi for con-trolling all the sensors and actuators. There is lots of benefit to use the raspberry pi because of inbuilt feature like system-on-chip.

I. WSN

Wireless Sensor Network have large number of micro sensors which have small volume, low cost and battery power. It is used to solve the issues of the communication bandwidth, data transmission, real time detection and so on.

J. Camera module

The camera module consists of a web camera and it is mounted on the robot and the video signal is transmit-ted to the receiver at control room. The camera module will transmit the video coverage of the paths and thus helping in easier mapping of the path to be taken by the rescue team. For real time applications, camera of high range is to be used to get good clarity and good coverage of area. The function of camera also helps the robot from getting stuck in a pit as the obstacles lying in path is foreseen and required action can be taken, thus improving the life of robot in the disaster area. Due to which we can observe the robot & we can see live vision

K. Software Working Module

In this proposed project the system is working on the Raspberry system which is core system which provide the kernel for the software. Raspberry pi have already integrated of the library and programming environment. This will help to integrate the sensor and actuators easily because it provides the all Library of the Adafruit which is help to run the actuators and the Sensors.

The working flowchart for the detection of the student activity is shown in the figure 5.

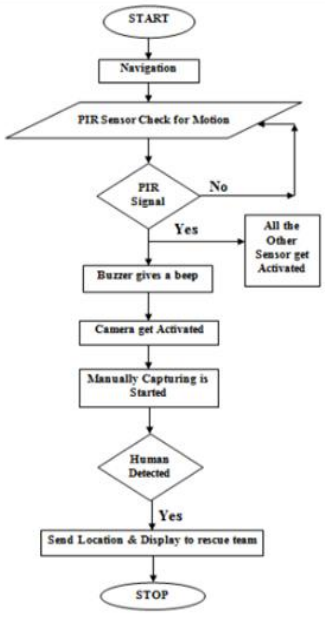

Fig. 5. Working model of project

Videos live Streaming facility provides the controller to keep tracking of each and every class while in the exam without visiting in class. The activity of the student will be live streamed on wireless network.

To streaming the videos capture by the robot will be send over the wireless network through the mobile application which provide recording of the videos.

Mobile application is used which is compatible with python language which will provide simple interface to the developer to understand the working of the application.

This application is free available and can be used in various applications.

L. Working of the Projects

In the growth of the technology in the field of artificial intelligence and robotic, each and every work is done by the ro-bots.

Working of the robot is more accurate than human working, this project is proposed for the detecting activity of student in exam hall and making the decision on the activity which was legal or not. There is Mobile application or IP webcam can be installed on the robot which will help to detect the action of the robot and also in the video streaming.

In the Class room activity violating the rules and regulation of the exam it will beep or on the sounds indicating activity violating rules of exam and the streaming videos on the controller room will clearly identify the student name with their seat number.

Not only detecting activity of the student it should match all the pattern of the paper providing to students. Paper which is not allowed in exam will detected by using of pattern matching algorithm for objects and appropriate action is taken by the robot.

Sensor installed on the robot will communicate with the environment. There are mainly two sensors which will used for the communication propose they are IR (infra-red) and Ultrasonic sensor they collect the environment detail and send the data to the processor which will process on that and give the command to the motor which are installed on the base of the system will move according to the decision made by the processors.

3. Conclusion

This project will provide the controlling of exam controller robot. Finally, we have planned the robot which will be oper-ate in good manner. Future Scope of this project can work in multiple areas.

The application of the wireless network providing the detection of the students in exam hall capture the activity and streaming videos with help of mobile application which is compatible with different language like PHP, Python, Javascript which help the project more user friendly.

The uses of freely available and inbuilt packages of the python make this project is cost effecting and can be installing

easily on the system in any department. Easy to understand in the development of the phase and can be reused in any of the department. This project is also used as the security surveillance system which will provide the live streaming of the environment where it deployed.

Machine learning algorithms i.e. supervised learning also help to run in small organization but it can be advance by using of unsupervised learning with providing the access of the unknown student or unidentified student for the access of the student in the restricted classes.

References

[1] Jingtian Zhang, Hubert P.H. Shum, Hungong Han and Lino Shao "Action Recognition from Arbitrary Views Transferable Dictionary Learning."

[2] Mehran pakdaman, M. Hehdi Sanaatiyan and Mahdi Rezaei Ghahroudi "A Line Robot from Design to Implementation Technical Issues and Problems".

[3] Adarsh Modh, Mosam Dabhi, Lakshmi Narayan Mishra and Vishnu Narayan Mishra, "Wireless Network Controlled Robot Using a Website Android Application or Simple Hand Gestures."

[4] An autonomous wireless sensor network deployment system using mobile robots for human existence detection in case of disasters Ad Hoc Networks 13, 2014, 54–68.

[5] Sandeep Bhatia, "Alive Human Body Detection Using an Autonomous Mobile Rescue Robot." aspireacademicexcellence.com/documents/Mr.SandeepBhatia.pdf

[6] A joint network for disaster recovery and search and rescue operations journal, homepage: www.elsevier.com/ locate/comet 2012.

[7] Alive human body detection system using an autonomous mobile rescue robot India Conference (INDICON), 2011 Annual IEEE.

[8] Research on human body detection methods based on the head features on the disaster scenes Systems and Control in Aeronautics and Astronautics (ISSCAA), 2010.