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SURVEILLANCE BOT

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Abstract*— Cloud robotics is a field of robotics that attempts to invoke cloud technologies such as cloud computing, cloud storage, and other internet technologies centered on the benefits of converged infrastructure and shared services for robotics. Our project is a cloud robot that is used in industrial and manufacturing environments. It works on a ROS platform. Here we use a Raspberry Pi controller to control the various devices attached to it. For testing, this implementation, an Android phone, camera, DC motor, sensors, and a Raspberry pi controller have been used. The movement of the robot is provided by DC motors and the direction is controlled from an android environment using Robot operating system (ROS). The controller and the receiver end are connected by Wi-Fi. The data input from the gas, temperature, and infrared sensors is given to the Raspberry Pi controller. A camera is used to provide visual input of the surrounding environment to the robot. The data obtained by the sensors and camera are processed by the controller and stored in the cloud.

Keywords—*Raspberry Pi, Temperature sensor, Gas sensor, IOT, Web camera*

1. INTRODUCTION

Cloud robotics is a field of robotics that attempts to invoke cloud technologies such as cloud computing, cloud storage, and other Internet technologies centered on the benefits of converged infrastructure and shared services for robotics. Our project is a cloud robot that is used in an industrial and manufacturing environment. It works on a ROS platform. Here we use a Raspberry Pi controller to control the various devices attached to it. For testing, this implementation, an Android phone, camera, DC motor, sensors, and a Raspberry pi controller have been used. The movement of the robot is provided by DC motors and the direction is controlled from an android environment using Robot Operating System (ROS). The controller and the receiver end are connected by Wi-Fi. The data input from the gas, temperature, and Infra-Red sensors is given to the Raspberry Pi controller. A camera is used to provide visual input of the surrounding environment to the robot. The data obtained by the sensors and camera are processed by the controller and stored in the cloud. The proposed system has a Raspberry Pi-controlled robot that moves in a specified path. Raspberry pi controls the DC motors to move in a specified path. A camera is also connected to the system to monitor industrial activities. The system is also equipped with Temperature Sensor, Gas Sensor, IR sensor to obtain the readings. The lamp will be used in the absence of light. The absence of light can be identified by using LDR Sensor. A cooling fan will be used when the system temperature is high. The room temperature is obtained with the help of the temperature sensor. When the system goes into a critical situation, the system will go loud using Speaker. The loads are controlled with the help of the relay board. And all these data are transmitted to the cloud using the Built-in Wi-fi.

2. EXISTING SYSTEM

Existing system that exists where it monitors industrial activities individually and operated manually. The existing system needs Special maintenance work and needs human work. Application-wise costs and maintenance are high when compare to our proposed system. Gas monitoring and temperature monitoring system works separately.

3. BLOCK DIAGRAM

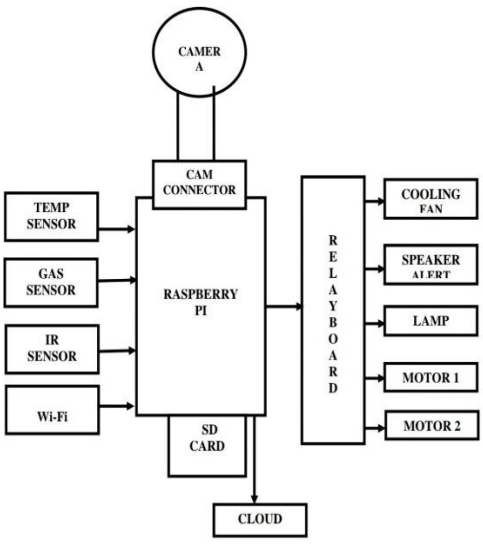


FIGURE 1: BLOCK DIAGRAM OF THE SYSTEM

The project is implemented using Raspberry pi, Temperature sensor, Gas sensor, IOT, web camera.

4. METHODOLOGY

A. RASPBERRY PI 3+

The Raspberry Pi 3 is the third generation Raspberry Pi. It replaced the Raspberry Pi 2 Model B in February 2016. The Raspberry Pi 3 has an identical form factor to the previous Pi 2 (and Pi 1 Model B+) and has complete compatibility with Raspberry Pi 1 and 2. The best part about all this is that the Pi 3 keeps the same shape, connectors, and mounting holes as the Pi 2.Dual Core Video Core IV® Multimedia Co-Processor. Provides Open GL ES 2.0, hardware-accelerated Open VG, and 1080p30 H.264 high-profile decode

FIGURE 2: RASPBERRY PI CONTROLLER

B. WEB CAMERA

A webcam is a video camera that feeds or streams its image in real time to or through a computer to a computer network. When "captured" by the computer, the video stream may be saved, viewed, or sent on to other networks via systems such as the internet, and email as an attachment. When sent to a remote location, the video stream may be saved, viewed, or sent there. Unlike an IP camera (which connects using Ethernet or Wi-Fi), a webcam is generally connected by a USB cable, or similar cable, or built into computer hardware, such as laptops.

FIGURE 3: WEB CAMERA

C. TEMPERATURE SENSOR

The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 thus has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling.

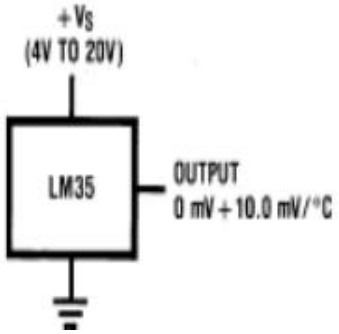


FIGURE 4: BASIC CENTIGRADE TEMPERATURE SENSOR (+2°C TO +150°C)

The LM35 does not require any external calibration or trimming to provide typical accuracies of ±1⁄4°C at room temperature and ±3⁄4° over a full −55 to +150°C temperature range. The LM35's low output impedance, a linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and minus supplies. As it draws only 60 µA from its supply, it has very low self-heating, less than 0.1°C in still air. The LM35 is rated to operate over a −55° to +150°C temperature range, while the LM35C is rated for a −40° to +110°C range (−10° with improved accuracy).

D. GAS SENSOR

This is a simple-to-use liquefied petroleum gas (LPG) sensor, suitable for sensing LPG (composed of mostly propane and butane) concentrations in the air. The MQ-6 can detect gas concentrations anywhere from 200 to 10000ppm. This sensor has high sensitivity and a fast response time. The sensor's output is an analog resistance. The drive circuit is very simple; all you need to do is power the heater coil with 5V, add a load resistance, and connect the output to an ADC. This LPG Gas Sensor (MQ6), ideal sensor for use to detect the presence of a dangerous LPG leak in your home, car, or in a service station, storage tank environment. This unit can be easily incorporated into an alarm unit, to sound an alarm or give a visual indication of the Combustible Gas / LPG concentration. The sensor has excellent sensitivity combined with a quick response time.

FIGURE 5. GAS SENSOR

E. RELAY

A relay is an electromechanical switch that is activated by an electric current. A four-relay board arrangement contains a driver circuit, power supply circuit, an isolation circuit. A relay is assembled with that circuit. The driver circuit contains transistors for switching operations. The transistor is used for switching the relay. An isolation circuit prevents reverse voltage from the relay which protects the controller and transistor from damage. The input pulse for switching the transistor is given from the microcontroller unit. It is used for switching four devices.

FIGURE 6: RELAY

F. EXHAUST FAN

A DC fan is a device used for cooling purposes in many systems. when a supply is given to a device it starts rotating. The direction of the fan can be changed by reversing the supply. DC or direct current fan works on the principal, when a current-carrying conductor is placed in a magnetic field, it experiences a torque and tends to move. The fan has a DC brushless motor, with an operating voltage of 5V, and is rated at 360mA. Keeping the

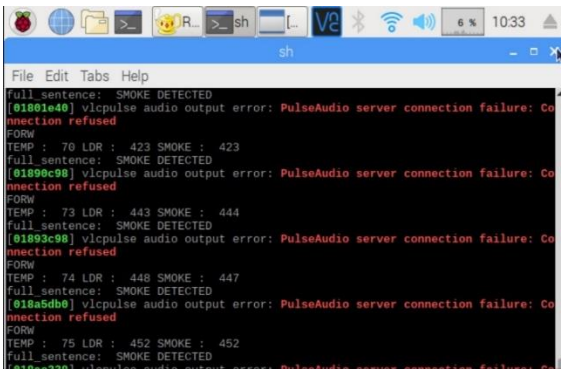
temperature down in your project can often be a necessity, and this fan can help. When designing the electronics that interface to a DC brushless cooling fan, it is critically important to be aware of this behavior.

FIGURE 7: EXHAUST FAN

5. WORKING

Here we use Raspberry pi, 3+ model. It is used as the heart of our invention because it is an open-source where one can get a lot of related information so we can able to customize the system depending on the needs. It is used as a CPU of our BOT. The supply is given in two ways. The first one is 5v from the power bank for Raspberry pi. And the second one is a 12v supply from the battery to the IOT then followed by a relay. Now the bot is ready for monitoring. We can see what the bot is monitoring by using pc and mobile. To start the bot before we want to connect the Raspberry Pi to our mobile or pc by using a hotspot. Here we provide a separate username and password for Raspberry pi. Also, provide a server for getting stored data by using username and password. We use an App to run the bot and getting the image and data. Once the connection is done then give the run command in our App. The motor now starts the bot in is the path.

6. RESULTS



7. CONCLUSION

Is impedance control a topic where it is still worth investing in research resources? The authors believe that, as long as the work is oriented towards bridging the gap between theory and practical implementation, there is still plenty of space for new contributions. In the present paper, several points related to this approach have been touched, from the role of IJC positional control to joint elasticity to fiction in the joints. The result is a control scheme that can be implemented without accurate knowledge of the dynamics of the manipulator and without redesigning the motion control system. Nice results have been already obtained and shown, while other experiments, involving tasks where the rotational impedances enter the game, are presently under work.

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