Smart Kitchen IOT System Based on Deep Learning

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***Abstract*- With advancement of automation technology, life is getting simpler in all aspects. Rapid increase in the number of users of internet over the past decade has made internet is a part of life and IoT is the latest internet technology. Wireless kitchen automation system using IoT is a system that uses computers or mobile devices to control the basic kitchen functions and features automatically through internet from everywhere around the world. The development and design of the wise monitoring and controlling system for kitchen atmosphere instantly continues to be reported within thin paper. The machine can monitors the status of kitchen and send an alert information via IOT network instantly, when the conditions get abnormal, to some concerned government bodies cell phone, the ARM 7 LPC 2148 microcontroller is utilized within the implementation of sensor module. The machine primarily monitors kitchen atmosphere parameters for example light intensity, room temperature, fire detection, LPG gas level and motion detection, and continues to be developed.**

***Index terms*- Bluetooth device, Raspberry Pi3, DC Motor, Smart Phone.**

1. INTRODUCTION

Internet of things (IOT) is the network of devices and home appliances that contain electronics, software, actuators, and connectivity which allows these things to connect, interact and exchange data. The recent advances in sensor technology empowers adaptable smart systems targeting safety. Smart sensing in ambient systems enables to enhance safety during cooking which is very important for people. The smart kitchen IOT system project which aims at operating notifies the user about status of the kitchen with the help of mobile application and smart messaging. The main advantage of using this system is to detect gas, fire, temp, smoke leakage detection, overcooking and people forgetting to turn it off. The system consists of Raspberry Pi processor, smoke sensor, gas sensor, fire sensor, temperature sensor, buzzer and a motor attached to wall. Automatically a message is sent through Wi-fi enabled smart phone and server, so that quick action can be taken by the user.

2. LITERATURE SURVEY

Liquefied petroleum gas (LPG) is currently the most used gas in our home for cooking purposes. LPG gas is a flammable gas, if leaked it can cause major damage to life and property. Therefore, it should be used in safe handling manner and additional care has to be taken in order to prevent any leakage possible. The main features of LPG are that being heavier than air, it do not disperse easily and may lead to suffocation when inhaled. The leaked gases when ignited may lead to explosion. The number of deaths due to the explosion of gas cylinders has been increasing in recent years. Now a day's people are having very busy schedule and hence sometimes they forget or don't get enough time for booking the gas from the gas agency. So it would be much easier and helpful if there was a provision to book the gas automatically. A major amount of gas is being wasted due to the carelessness of consumer's. Sometimes they forget to turn off the burner which may also could lead to damages. Our proposed topic aims at detection of gas leakage and automatic controlling of gas valve. The smart gas system which provides home safety, detects the leakage of the LPG and alerts the consumer about the leak by a notification through by using android app through Internet Of Things (IOT) and consumer can turn off the gas valve, from anywhere in the world. The additional advantage of the system is that it continuously monitors the level of the LPG present in the cylinder using load sensor and if the gas level reaches below the threshold limit of gas so that the user can replace the old cylinder with new in time and books the cylinder by automatically send a notification to the gas agency. An added feature is that if the users accidently forget to turn off the gas burner, the

system will inform by activating an alarm. So the problem of wastage of energy is solved.

3. SYSTEM ANALYSIS

3.1. Existing System

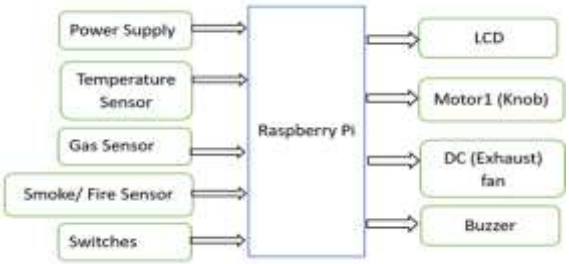
Smart Kitchen IOT System is designed for the purpose of smart cooking. For example in this system, there is special feature for detecting the leakage of gas. Natural gas is another widely used fuel in homes. They burn to produce clean energy, however there is a serious threat about their leakage. The gases being heavier than air do not disperse easily and may lead to suffocation when inhaled, also the leaked gases when ignited may lead to explosion. The number of issues due to the explosion of gas cylinders has been increasing in recent years. There is a need for a system to detect and also prevent leakage of gas.

3.2. Proposed System

When things like household appliances are connected to a network, they can work together in cooperation to provide the ideal service as a whole, not as a collection of independently working devices. This is useful for many real-world applications and services. To achieve this, we make use of IoT based system. This system will overcome all the issues that the existing system couldn't fulfil. This is achieved by using sensors to detect the gas leakage and heat produced, fire, and smoke, which will then intimate it to the user by sending SMS and alert siren.

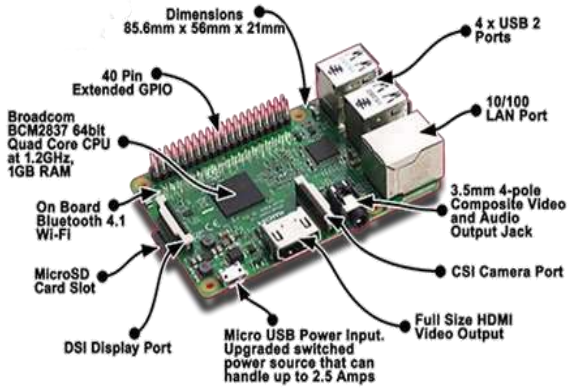
4. SYSTEM DESIGN

4.1. Block Diagram: The block diagram of the design is as shown in Fig. It consists of power supply unit, Raspberry pi processor, Fire sensor, Gas Sensor, Temperature sensor, smoke sensor, Exhaust fan, DC motor, Switches, Buzzer, LCD. The brief description of each unit is explained as follows.



5. HARDWARE REQUIREMENTS

5.1. Raspberry pi



Raspberry Pi is the brain of robot loaded by a program written in Python language to do the required functioning and is interfaced with Bluetooth module. The motor driver are used to make the system work as we want.

5.2. LPG Gas Sensor

Gas sensor use to identify condensed oil gas (LPG). It additionally identifies propane and butane fixations noticeable all around. The scope of gas fixations noticeable all around are identified by MQ-6 is from 200 to 10000ppm. High affectability and quick reaction time are the focal points of MQ-6. The yield of sensor is a simple protection. It is a basic circuit; it requires control the warmer curl with 5V, including a heap protection in it, and at that point associate the yield to an ADC.

5.3. Smoke Sensor

Smoke sensor is an ignitable gas and smoke sensor, use to recognize the centralizations of flammable gas or smoke noticeable all around and yields its perusing as a simple voltage.

5.4. Fire Sensor

A fire detector works by detecting smoke and/or heat. These devices respond to the presence of smoke or extremely high temperatures that are present with a fire. After the device has been activated, it will send a signal to the alarm system to perform the programmed response for that zone.

5.5. Temperature Sensor

Temperature Sensors measure the amount of heat energy or even coldness that is generated by an object or system, allowing us to "sense" or detect any physical change to that temperature producing either an analogue or digital output.

5.6. DC Motor

A DC motor consists of a stator, an armature, a rotor and a commutator with brushes. Opposite polarity between the two magnetic fields inside the motor cause it to turn. DC motors are the simplest type of motor and are used in household appliances, such as electric razors, and in electric windows in cars.

5.7. Buzzer

Buzzer is a passive buzzer. Like a magnetic speaker, it needs voltage with different frequency so that it can make sound accordingly. The pitch becomes louder when the frequency gets higher.

5.8. Power Supply

A power supply for electronic devices. Also called an "AC adapter" or "charger", power adapters plug into a wall outlet and convert AC to a single DC voltage. Computers use multiple DC voltages, and the power adapter is the external part of the power supply for a laptop.

5.9. LCD Screen

LCD screen consists of two lines with 16 characters each. Each character consists of 5x7 dot matrix. Contrast on display depends on the power supply voltage and whether messages are displayed in one or two lines.

5.10. Exhaust Fan

Exhaust fans pull doors, fumes, and moisture from an area of the home, venting them outdoors for removal. The fan uses a motor to turn its blades, which function to pull air out of the space. The stale, humid, or contaminated air is propelled through the exhaust vent, exiting the home.

5.11. Switches/Pushbuttons

A Push Button switch is a type of switch which consists of a simple electric mechanism or air switch mechanism to turn something on or off. Depending on model they could operate with momentary or latching action function. Push Button Switches come in a range of shapes and sizes.

5.12. L293D Current Driver

L293D is a typical Motor driver or Motor Driver IC which allows DC motor to drive on either direction. L293D is a 16-pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motor with a single L293D IC. Dual H-bridge Motor Driver integrated circuit (IC).

6. SOFTWARE TOOLS

6.1. RASPBIAN OS:

Raspbian is the recommended operating system for normal use on a Raspberry Pi.

Raspbian is a free operating system based on Debian, optimised for the Raspberry Pi hardware. Raspbian comes with over 35,000 packages: precompiled software bundled in a nice format for easy installation on your Raspberry

Raspbian is a community project under active development, with an emphasis on improving the stability and performance of as many Debian packages as possible.

6.2. PYTHON

Python IDLE

Follow these instructions to write and run a simple Python program using the IDLE editor:

Fig: Python IDLE Ecitor

1. Start IDLE (see screen above). You will then see a window entitled "Python Shell"

Fig: Python Shell window

2. From the Python Shell window, select New Window from the File menu.

3. You will see a window entitled "Untitled"

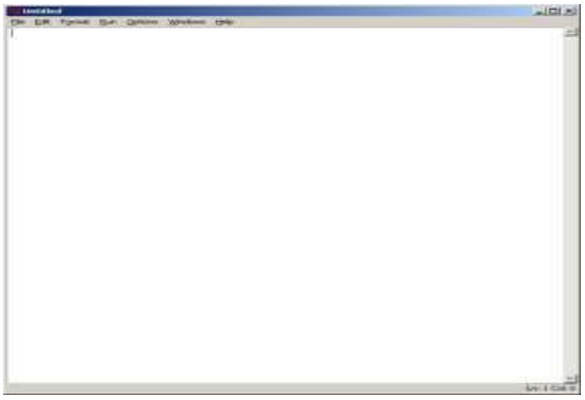


Fig: Untitled Window

4. From the File menu, select Save As, and select a folder to save your Python program file.

Fig: Save As Window

5. Select a folder to save your file in.

6. In the File name: text box, type: program1.py

7. Then click on the Save button. You will then see a blank editor window ready for you to type in your Python program.

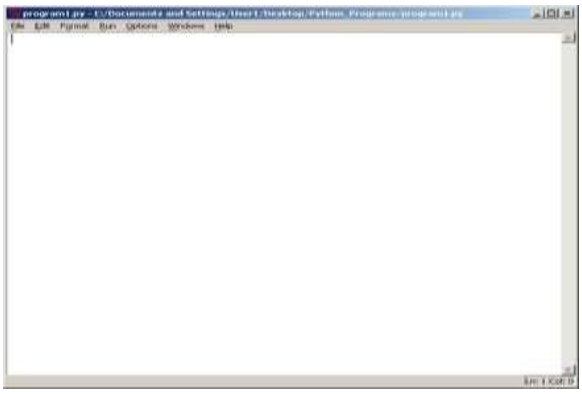


Fig: program1.py Window

8. The following program statement will run under Python 2.x or Python 3.0

Type in the following text into this window (make sure the word print is all in lower case):

Print ("Hello World")

If you're running Python 2.x, the text will automatically change colour to look like this

Print ("Hello World")

If you're running Python 3.0.x, the text will automatically change colour to look like this:

Print ("Hello World")

9. To run this program, select Run Module from the Run menu. You should see a reminder to save the Source (your program).

Click on OK to save.

Then you will see your program running in a Python Shell window.

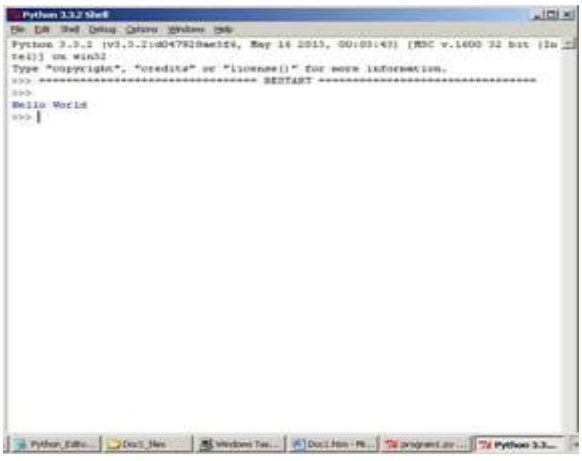


Fig: Python Shell window

Close all Python windows to quit Python.

7. RESULTS

It is always better to start every design with a good proposal, which will stand as a reference point to the

work as it proceeds. The result of any design gives joy if aims and objectives are gotten. Since the project performed its proposal, it indeed satisfactory. Now from the input to the output of each stage was a success.

Click here: http://embeddedspot.top/iot/index.php
User Name: iot079
Password: iot079

8. CONCLUSION

The implementation of smart kitchen is done successfully. The communication is properly done without any interference between different modules in the design. Design is done to meet all the specifications and requirements.

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