

## FOOD SPOILAGE DETECTION SYSTEM

Simant Mishra\*<sup>1</sup>, Chandu Surya Prakash Naidu\*<sup>2</sup>

\*<sup>1</sup>Electronics & Communication Engineering, Lovely Professional University, Phagwara, Punjab, India.

\*<sup>2</sup>Professor Kanwaljeet Kingh, Embedded Systems, Lovely Professional University,  
Phagwara, Punjab, India.

### ABSTRACT

As technology continues to develop and with growing dependence on smart devices like smartphones, people are increasingly attempting to solve everyday problems in a more efficient and convenient manner. Taking control of the different jobs at home and in industry is easier with smart technology. Food detection system using Arduino is the subject of this paper. In the proposed system, a detection and recognition algorithm is used to detect and report food spoilage. Its main purpose is to identify food spoilage automatically and inform the user accordingly. The paper discusses the programs and sensors used by Arduino, which is a technology that works with the Arduino microcontroller. For reasons such as marketability and law-abiding applications, Arduino is the key component of computer vision. Second, following much research, realistic technology has become reasonably accessible. Researchers and scientists from diverse fields like computer science, food and different organizations are all interested in this area of research. Microcontrollers have the capability of interpreting input and output, and turning on sensors based on those inputs and outputs. Most foods are stored in refrigerators, which lowers the bacteriological production rate. However, certain foods that should be detected and informed by the user include perishables or items stored for short periods of time. Through continuous sensing of food signals and sending an alert message to a registered mobile phone, this paper tries to solve the food spoilage problem using sensors.

**Keywords:** Arduino, Microcontrollers, Sensors, Food Detection, Technology.

### I. INTRODUCTION

To ease the day-to-day work, modern technologies are being developed. Within a globalizing and urbanizing environment, technology is being updated and enhanced for overall society development. It has become more and more important to think about the quality of food in the life of human beings. Food quality arises from its cleanliness and its ability to sustain for a longer period of time. Food quality should be checked to prevent it from spoiling under changing environmental conditions like temperature. Almost all health problems can be attributed to eating unprepared or pink animal flesh, which can rot and become noxious when eaten. The tongue can determine the quality of food by observing its colour. In addition to various other food-related diseases, rotten or unfit for use food can cause food poisoning. A food spoiler detector is designed to detect the gas released by rotten or unfit for use food. Researchers today find it easier to detect spoiled food using two approaches instead of the methods that were previously employed, which were very costly to install. In this system, the Arduino UNO is used as a prototyping board and ESP8266 is used as a switch to connect the Arduino to the internet. Arduino and ESP8266 are operated by a Wi-Fi modem. With an LCD panel, you can view the output of the sensor, which is connected to the Arduino board.

### II. LITERATURE SURVEY

#### Survey 1

A colossal study was led all through Europe to work out important elements in affecting European customer food determination. The journalists showed that the main issue was quality/newness followed by style, solid eating regimen, cash, family tendency and in the long run, habits. Other study counting 171 U.S. also 205 Irish customers reasoned that brand and newness were the first featured credits once inquired not entirely set in stone on the off chance that a supplement is of top quality (George, 1993) among the clients asked, thirty-fifth of the U.S. what's more thirty-eighth of Irish individuals clients featured newness. During 1999, newness was the third generally essential justification behind picking an essential market, basically behind, "great food things" and a "cleanliness furthermore coordinated store" (FMI, 1999) numerous other reviews were led to see the variables affecting food things determination among the populace.

**Survey 2(IoT)**

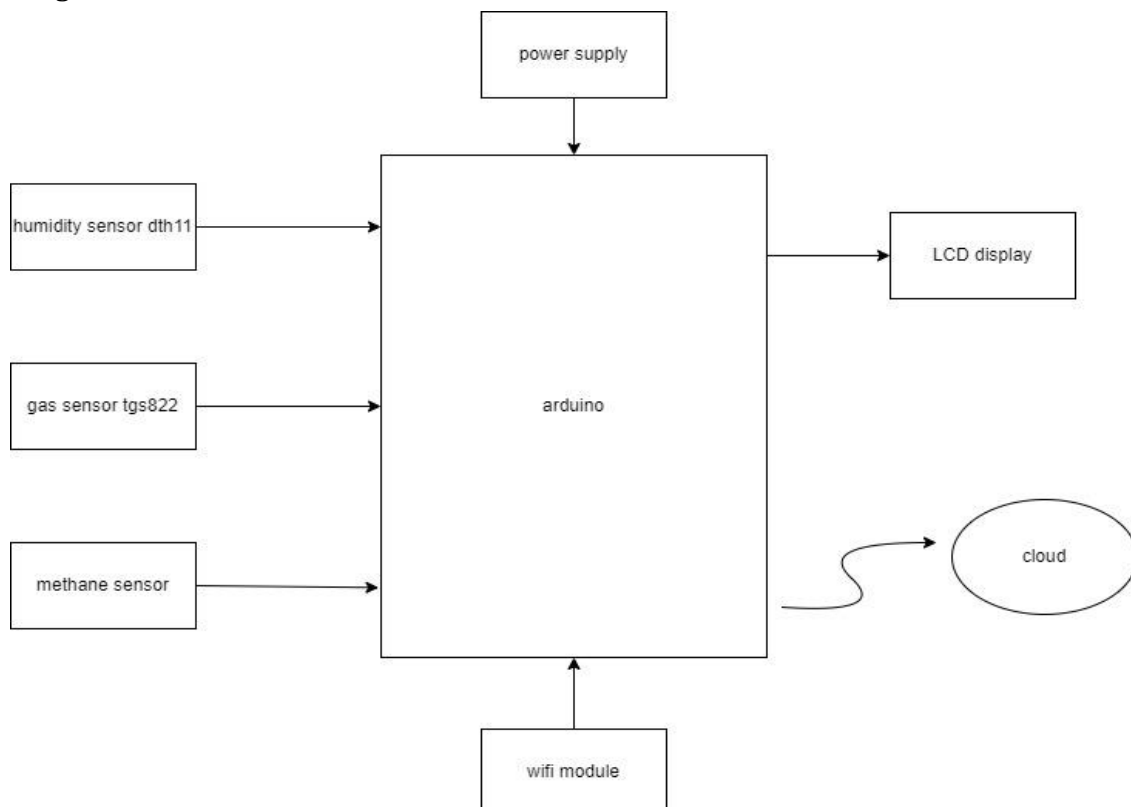
IoT is an arising idea for interfacing objects or things with the web utilizing sensors, actuators and other ID and detecting advancements to accomplish brilliant acknowledgments, situating, following, observing and organization. The IoT detecting framework consolidates the elements of canny sensor, remote correspondence and radio recurrence ID (RFID) innovation. In this manner, Internet of things is achievable in laying out a perceivability and recognizability framework in dealing with transitory food. In [1]-[3], [4]-[5], [6], [7]-[9] and [10] essential sensors for example, temperature, stickiness and light sensor are utilized to screen various boundaries that causes food waste and then, at that point, the information is shipped off the cloud. The client is told about the quality changes utilizing IoT innovation and can handle the deterioration of food physically or consequently. [12] Proposes a framework utilizing Bluetooth Low Energy and IoT innovation, to follow the food quality all through the flow by utilizing an electronic tag. [11] Uses an IoT framework that has an infrared camera to catch pictures of verdant food in the field. The information is then, at that point, shipped off an Arduino processor through a Wifi module and a choice is made in light of the information.

**Survey 3**

In our daily life the food newness is diminishing because of debasing the food stuff by blending low quality debasement for unique food stuffs. This will prompts a few medical problems when people devours this food. It has been impacted in rustic and metropolitan regions. A large number of the outcomes have been show that the put away milk contains some measure of organisms like microbes. From this we comprehended that there is a need to foster some observing or controlling framework to continue following or actually taking a look at the newness of the crude milk. In the paper[13] there are sensor units, which must be associated with Arduino Uno board and every one of the sources of info are given to application with the assistance of Bluetooth module. In light of fat and liters the sum of microbial movement is determined. From the versatile application the outcome update is given to clients.

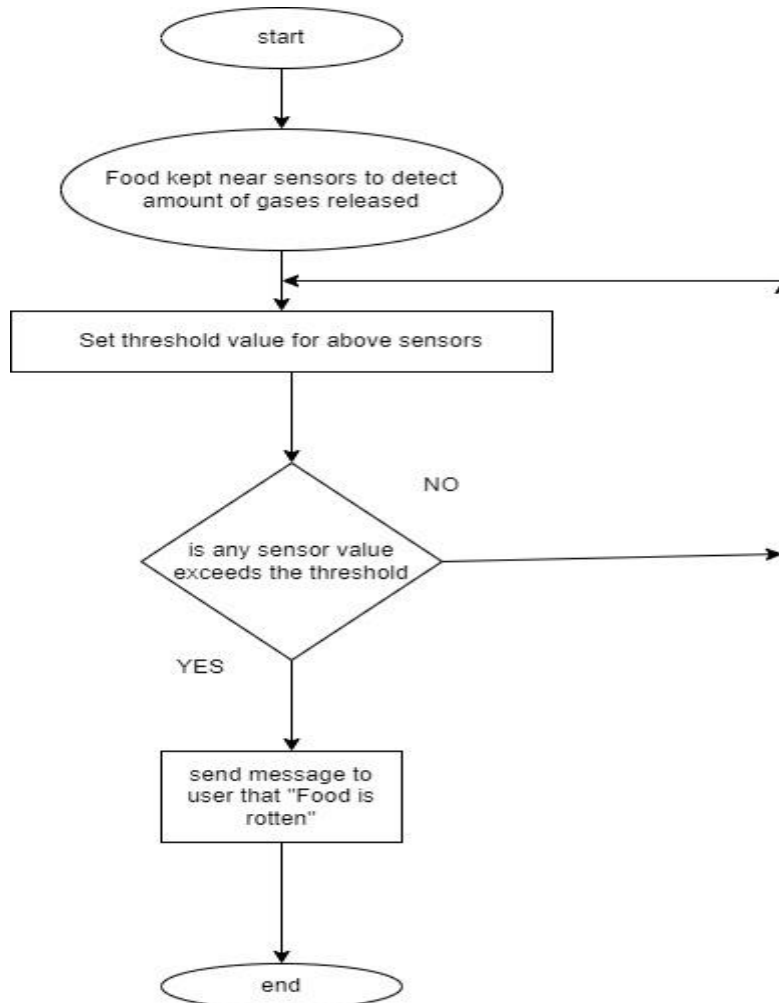
**III. PROPOSED WORK**

**Block Diagram of Prosed Work:**



**Figure 1:** The Block Diagram consists of Arduino UNO Microcontroller, Power supply, Humidity Sensor DTH11, Gas Sensor TGS822, Methane sensor, Wifi module, LCD display, Cloud.

#### IV. FLOWCHART OF PROPOSED WORK



**Figure 2:** Once the food is kept near the sensors, the gases released by the food is monitored and if the gases released by the food exceeds the limit set on the sensors then the message is sent to the user with the help of wifi module on the user’s phone that “the food is rotten” and if the gases released are below the threshold value then the sensors keep on sensing until the threshold value is reached.

#### V. FUTURE SCOPE

1. Use of high accuracy sensors to build area of detecting.
2. Combination of at least four sensors for food sources which show various parameters.
3. Based on the amount of calorie consumed by the user we should deploy a sensor that will help user to take care of his/her diet.
4. Develop a system which is capable to work in any type of board/environment in non availability of one.

#### VI. CONCLUSION

Once the food is kept near the sensors, the gases released by the food is monitored and if the gases released by the food exceeds the limit set on the sensors then the message is sent to the user with the help of wifi module on the user’s phone that “the food is rotten” and if the gases released are below the threshold value then the sensors keep on sensing until the threshold value is reached.

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