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Non-Invasive Food Quality Test Analyzer for the Usage of Diabetic Patients

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Non-Invasive Food Quality Test Analyzer for the Usage of Diabetic Patients

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A B S T R A C T

Diabetes mellitus commonly known as diabetes is a group of metabolic disorders characterized by high blood sugar level over a prolonged period of time. Diabetes can cause many health problems and complications. To overcome this problem, we are going to design a device which we take. The main objective of this device is to make easy for the diabetic patients to check their glucose level in the food without any risk. In this device two types of sensors are used one is temperature sensor and the other one is pH sensor and an Arduino Uno microcontroller is also used which reads the inputs-light on sensors. This device is going to be like a wrist watch. Initially a strip is dipped in the sugar solution or glucose water then the same strip is inserted in the device, then this device shows the amount of sugar or glucose present in your food in the LCD display. In this way whenever the sugar content increase or decrease in your food then the device gives you a warning sound with the help of the buzzer fixed in the device. This device is portable, cost effective and durable and it is very easy to use. In this way a non- invasive food glucose monitor is designed.

Diabetes is a group of metabolic diseases in which a person has high blood glucose levels over a prolonged period. Diabetes leads to excessive urination and thirst. And one of the most common diabetes complications is nerve damage. Nerve damage can cause numbness and pain. Nerve damage most often affects feet and lungs but can also affect your digestion, blood vessels and heart.

So, to avoid these problems and complications we are developing a device, in this work a temperature sensor, pH sensor is developed and presented and an Arduino Uno microcontroller is used. This microcontroller plays a major role. The Uno is the most used board of the whole Arduino family. In this process pH is also an important parameter to be measured and controlled. The temperature measurement is one of the fundamental requirements. This can be utilized to screen the glucose levels in the food, it is like a wrist watch and can be worn from younger to elder individual. In this context, the main contribution of this article is to give a comprehensive overview on non-invasive food glucose monitor based on the above information we came to know that diabetes became more common now a days, and this remains lifetime so we need to manage the sugar content in our body, to maintain the sugar content we need to take the low sugar content food in our daily diet. Most of the people doesn't know the amount of sugar present in their food in such cases without their notice they will take the food with high sugar content.

To overcome that we were trying to design a device which measures the glucose content or sugar content in our food. Non-invasive is an advanced technique to measure the sugar content. This is a wearable device that continuously measures blood glucose. This includes data logging and alarm functions to track glucose levels when they are too high or too low. The main objective of this device is to make it easy for the diabetic patients to check their glucose levels in the food by their own without any risk.

The main principle of this device is to measure the glucose or sugar levels from the food which the diabetic patients are going to take, and the glucose levels are measure with the help of pH sensor. And this device also measures the temperature levels in the diabetic patient's body. In a simple way this is an easy device to use for the diabetic patients from younger to elder that measures the sugar levels from the food and displays on the LCD display.
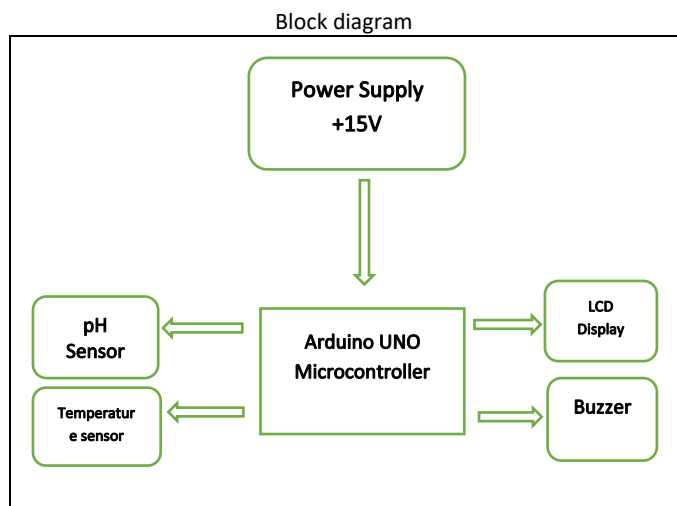
MATERIALS AND METHODS

In this device a temperature sensor, pH sensor and an Arduino uno microcontroller is used. The temperature sensor is used to measure the temperature of the patient body and gives the sound through the buzzer when it is high and pH sensor is used to measure the glucose level of food which the diabetic patients are going to take. Arduino uno microcontroller is used to read inputs-light on sensors. This device is a wearable device

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like a wrist watch that monitor the sugar levels continuously Initially a power supply of +15 V is given to the Arduino uno microcontroller and a strip is used, which is dipped in the food or sugar solution. Then the strip is connected or inserted in the device and the device reads the sugar levels from the food and shows the level of sugar in the LCD display and automatically the buzzer sounds and alerts the patient when the sugar level increases or decreases and displays the quality of food on the screen of LCD display.

Block diagram

RESULTS AND DISCUSSION

The food quality tester is beneficial for the diabetic patients. Nowadays due to the latest technological improvements in the devices we can assure the comfortableness to the diabetic patients. This non-invasive food quality tester uses ARDUINO UNO MICROCONTROLLER. To the Arduino uno microcontroller a temperature sensor and pH

sensor are connected which measures the temperature and pH of the patients. Usually the device is like a wrist watch which we can wear to the wrist of the diabetic patient. This device is very helpful for the diabetic patients. In this our proposed project, we will be giving an output which is obtained by the Arduino connected. The main aim of our project is to know the amount of the sugar present in the food which the diabetic patients take. By using the sensors, we are going to find the Ph and temperature of the patient i.e., temperature sensor, Ph sensor. And the values of the sugar content will be displayed on the LCD display.

As this is cost effective and portable this can be used by anyone, this is an efficient system and hence shows improvement over continuous monitoring and alerting system. This continuous monitoring also allows and alerts the diabetic patients to check the sugar levels present in their food very easily.

CONCLUSION

This system or device automatically record the glucose levels of the food and makes easy for the patients. As the device is effective and portable and it is very easy to operate. This device alerts the patients while taking their food. The strip is dipped in their food and inserted back to the device then the device automatically reads and measures the glucose levels in the food, when the sugar level increases then the buzzer sounds automatically in this way it alerts the patients and help them to take the correct diet. Design and development of a low-cost microcontroller- based device for measuring the quality of food for diabetic patients has been described. The device is economic, portable and durable and also easy to use. And there will be a future scope for this device there we can additionally measure fructose and galactose levels of the food. The serial output can be attached to the device so that the quality of food can be sent to PC.

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