Detection of Nutrients and chemicals in food products using sensors in smart phones

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Abstract: *Sensors are the physical devices whose function is to sense/detect the changes around its environment, and provides a corresponding output. There are differenct types of sendors available which are used for discrete applications. A Biosensor is a device used to detect nutrients (protein, vitamin etc) or chemicals (antioxidants, carbon contents etc). This paper presents the idea of making a cost-effective device using sensors to detect nutrient, chemical contents in foods like vegetables fruits etc and the output of these must be displayed in smart phones.*

Keywords: wireless sensors, biosensors, smart phones.

1. Introduction

Sensors are the physical devices whose function is to detect/sense the environment, process the data and send the data or display the data in output device. There are different types of sensors available with its unique properties which can be used in discrete applications example: A temperature sensor is used to detect the temperature of environment and its applicants can be used in detecting the temperature of human body. A light sensor is also another type of device that converts light energy whether visible or in infrared parts of the spectrum and its application can be used in camera. We are basically talking about biosensors. A biosensors are the device which sensor or detects the biological component, processes its data and displays the output. A biosensor is used in variety of applications like detection of sugar contents in human body, trace the gas detection in water treatment facilities, and another medical/chemical related targets. There paper proposed an idea of creating a cost-effective application for detection of nutrient/chemical contents in day to day foods like vegetables and fruits. The biosensor must be able to able to extract the nutrient/chemical contents of fruits and vegetables and display the output appropriately. As these devices are available in market, but out idea is to make it cost effective, portable and easily used by public or people.

2. SUMMARY

A biosensor device must be made, such that it should be the size of a paper pin, with traditional components like bioreceptors, biotrandcuder component and an electronic system which include signal amplifier processor and display.
A bioreceptor is a component that determines the target analyte. Usually a component include enzymes, antibodies nucleic acids etc. A biotransducer is a physiochemical detector component that changes the detection event into a measurable signal. In order to convert an event into a measurable signal, we require an electronic system. The following figure 2.1 shows the architectural diagram of the propose plan.

3. Workflow Model

As stared in previous section, a bioreceptors determines the target analyte and biotransccuder converts it to readable form.
In between there exists a processing system. Here the bioreceptors that detects the analyte is sent to a processing unit, The microcontroller in turn converts the analyte into chemical signals and from chemical signal to electrical signal. During the conversion from analyte to signals the microcontroller in turn uses memory for storage and references. Once the signal is converted, it is then send to biotransducer for detecting them into measurable signal. Once the signals gets detected is then sent to the transmitter section to send the data to smart phones in the form of output.
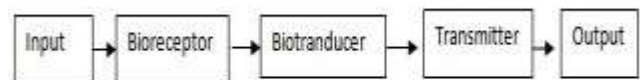
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Figure 2.1: Architectural diagram.

3.1 Input

Here the input will be a biosensor device which is

proposed to be the size of a paper pin, the biosensor should inject it into the target.

3.2 Bioreceptor

A bioreceptor is a component device which is used to detect the target analyte. Various types of biosensors can be classified depending upon the classification of bioreceptors. Some of the bioreceptors biosensors which can be used in this specific application are antibody/antigen, enzymes, nucleic acids, protein biosensors etc.

3.3 Biotransducer

A biotransducer is a transduction component of a biosensor system which converts the biochemical signal to electronic signal. Various types of biosensors can be classified depending upon the classification of biotransducer. Some of the biotransducers which can be used in these specific applications are electrochemical transducer, potentiometric transducer and optical transducer.

3.4 Transmitter

A device like Bluetooth, Wi-Fi or any other form of transmitting device is being plugged into a biosensor such that the desired result can be sent to a output device which can be located remotely.

3.5 Output

Here the output is Smart Phone where in we would view the result. With the advancement in android applications we could easily retrieve the result from the transmitter side and view the output.

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