SMOKERS SCRUTINY DEVICE

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Abstract

Health technologies are being developed for personal lifestyle and medical healthcare support, of which a growing number are designed to assist smokers to quit. The potential impact of these technologies in the fight against smoking addiction and on improving quitting rates must be systematically evaluated. The project aims in designing a scrutiny device for smokers which can identify a person's stages of smoking addiction by indicating through LEDs and sensors, In addition to this it can also detect whether a person is a potential smoker or not, by using sensors which are again indicated with LEDs.

Keywords:

MLX906I4 IR based Temperature sensor, MAX30100 heartbeat and SPO2 oxygen sensor, Air Blow sensor, SD card, LCD display, LED indicators.

1. Introduction

Cigarette consumption is one of the leading preventable causes of death worldwide; for instance, respiratory, cardiovascular diseases and cancers are three well- established health effects of cigarette consumption among both smokers and non-smokers.

The main objective of this study was to make use of modern technology in detection and determination of stages of cigarette addiction in smoking population which will assist in easy diagnosis and treatment of the infirm. According to WHO, there are 4 stages in smoking abuse depicting the seriousness of the addiction. Stages are named as follows:

STAGE 1: Pre-contemplation

STAGE 2: Contemplation

STAGE 3: Preparation and Action

STAGE 4: Maintenance

These stages can be determined by parameters: breath pattern(WRAW6c,,analysis), blood oxygen level, heart Rate and body temperature. Considering these parameters our device "SMOKER SCRUTINY DEVICE" was designed and developed by our team. This device is solely based on the intention for lending a helping hand in health care sector to provide ideal medication for desired therapeutic action in smoker quitting based on the seriousness of addiction. Indeed, we design a portable, wearable device included in specific parameters related to the person like temperature, heartbeat and spo2, air blow based on that the system can identify whether the person is smoker or not and which can give the indication through LEDs and which can detects the smoking levels of smoker using sensors, LEDs.

Breathing problem within nine months, the cilia begin to function normally and symptoms like coughing and **shortness of breath** become less

frequent.HR with high normal **heart rate**, 80-99/min, was 1.60 compared to **smoker** with 60-69/min and 2.69 compared to nonsmoker with 60-69/min. Conclusions: **Smokers** with high normal **heart rate**, constituted nearly one fifth of **smoking** population, shortened life by 13 years compared to nonsmokers. Nicotine harms the insides of blood vessels and reduces the amount of oxygen the **heart** receives, making the **heart beat faster** and the damaged blood vessels work hard.

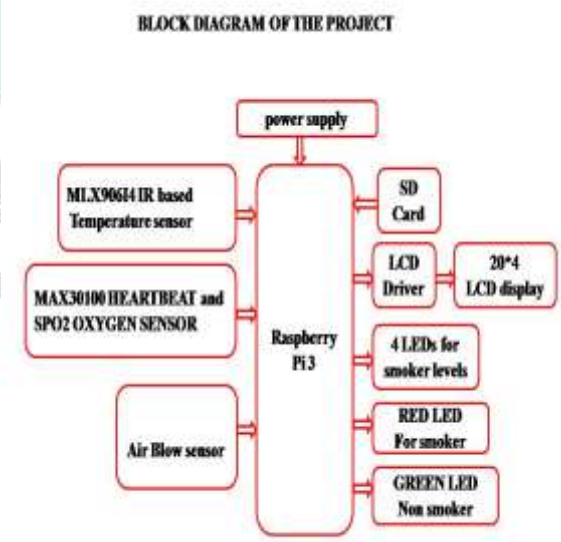
While the **Raspberry Pi Zero** can be set up to run like a standard (albeit bare bones) desktop computer, that isn't really the point. Rather, it's intended to be **used as** an educational tool for those who wish to learn to program. It's also intended to be modified and customized for specific tasks.The **SD card is** a key part of the **Raspberry Pi**; it provides the initial storage for the Operating System and files.

2. LITERATURE SURVEY:

The work described by Cole et al. represents one of the first steps towards the development of methods by employing a commercial smart watch inertial sensory data instead of a prototypal system of sensors, with the end-goal of integrating the proposed method in a novel real-time intervention for smoking cessation. It presents a Machine Learning system based on the use of an Artificial Neural Network (ANN) able to detect smoking events using only the accelerometer data collected via a smart watch. This evaluation is based on an exploratory work, which demonstrated that the 3-axis accelerometer signal is enough to identify smoking gestures presented in Cole.

The Case Western Reserve University (CWRU) developed a smoking cessation system able to perform the detection of smoking activities in real-time, based on the analysis of the movements registered by two armbands. The system has three main components: the software application component, which consists of the quitting plan and mindfulness training, the activity recognition component, composed by the armbands' raw signal data collection and the classification algorithm, and the Internet service component, that includes the message service and cloud sharing. In this paragraph, we focus on the second component, aimed to perform the detection of smoking activities, whereas the other two components will be described in the section concerning the smoking cessation tools. The activity recognition algorithm is based on a Long-Short-Term Memory (LSTM) neural network (see the Glossary). An LSTM is an artificial neural network specifically designed to analyze sequential data and time series. In this case, it is exploited to analyze the sequence of gestures of the user transmitted by the two armbands.

3. Implementation:



3.1 Block diagram of **SMOKER'S SCRUTINY DEVICE**

The system "**SMOKER'S SCRUTINY DEVICE**" can be interconnected with the sensors like

MLX90614, MAX30100, AIR BLOW and also indicating LED's. The main controlling device of the project is raspberry pi3 processor and it continuously monitors the sensors data based on that the processor gives the indication through LEDs. To perform the task, processor is loaded with an intelligent program written in python language. The **SD card is** a key part of the **Raspberry Pi**; it provides the initial storage for the Operating System and files.

4. Related Work:

The brief introduction of different modules used in this project is discussed below:

4.1. Raspberry pi3.

4.1.1 Raspberry pi3

Raspberry Pi 3 Model B is the latest single-board computer from the Raspberry Pi Foundation. In this version, they've upgraded to a 1.2 GHz 64-bit quad-core ARM processor and added 802.11n Wireless LAN, Bluetooth 4.1 and Bluetooth Low Energy.

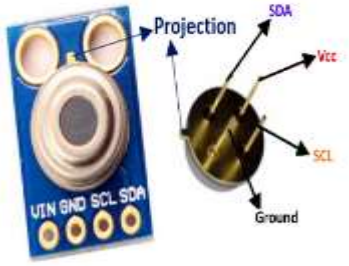
Like the previous version (the Pi 2) it has 1 GB of RAM, 4 USB ports, and full HDMI support. The Raspberry Pi 3 also has the same form factor as the Pi 2 (and Pi 1 Model B+).

The Raspberry Pi runs Raspbian and/or NOOBS (both Linux-based operating systems) which boot from the removable SD card. A host of third-party operating systems are also supported, including Ubuntu Mate, Windows 10 IoT Core, and OSMC.

The Raspberry Pi 3 is a credit-card sized computer capable of doing just about anything a desktop PC does. From web surfing and word processing, to playing Mine craft or acting as a media player, the Raspberry Pi's capabilities are extensive. With plenty of graphics processing power, the Raspberry Pi 3 is capable of streaming BluRay-quality video. If you're looking to incorporate the Pi into your next embedded design, the 0.1" spaced 40-pin GPIO header gives you access to 27 GPIO, UART, I2C, SPI as well as both 3.3V and 5V power sources.

4.2. MLX906I4 IR based Temperature sensor:

MLX90614 is a contactless temperature sensor used to measure temperature without touching the object using Infrared Rays. MLX90614 non-contact infrared temperature sensor can measure temperature in the range of -40°C to 380°C. MLX90614 Sensor can measure the temperature of an object which is 2-5 cm for from the sensor. The sensor has a field of view of 90 degrees and returns the average temperature value of all objects within this field of view. The module has an internal 17 bit ADC and DSP which provides high resolution and accuracy.



4.3. MAX30100

The MAX30100 is an integrated pulse oximetry and heart rate monitor sensor solution. It combines two LEDs, a photo detector, optimized optics, and low-noise analog signal processing to detect pulse oximetry and heart-rate signals.

The MAX30100 operates on a single 1.8V power supply and a separate 5.0V power supply for the internal LEDs. Communication is through a standard I2C-compatible interface.

4.3.1 MAX30100

4.4. Air blow sensor:

Air blow sensor to analysis the breath level of the person. Theis sensor consist of more features like Detectable sound signal size Built-in filter-rectifier circuit, DC signal output.Good sensitivity, built-in amplifier circuit, adjustable gain Voltage signal for sound intensity can be obtained by AD conversion Analog voltage signal output, signal amplitude VCC/2.

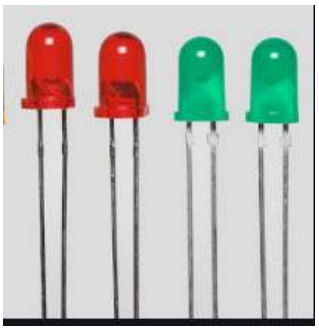
4.4.1 Air blow

4.5 LCD Display:
LCD (LIQUID CRYSTAL DISPLAY) :

4.5.1 16*2 LCD Display

One of the most common devices attached to a micro controller is a 16x2 LCD display. This means 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively. The project status will display on LCD.

4.6 LED Display:



4.6.1 LEDs

LED's are used as indicator lamps in many devices, and are increasingly used for lighting. Introduced as a practical electronic component.

In this project we are using RED, GREEN LED s to indicate the smokers and if the person was smoker the system detecting the smoking levels of smoker.

5. CONCLUSION:

The existing model presents an Integrating feature of all the hardware components which has been used and developed in it with Arm-11 Raspberry pi processor. The Presence of each and every module has been reasoned out and placed very carefully. Hence the contributing to the best working unit for "**SMOKER'S SCRUTINY DEVICE**" has been designed perfectly. Secondly, using highly advanced IC's like Broadcom BCM2387 chipset, 1.2GHz Quad-Core ARM Cortex-A53 (64Bit) processor, Linux operating system technology with the help of growing technology. Thus, the project has been successfully designed and tested.

6. ACKNOWLEDGEMENT

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7. RESULTS:

The project was designed a scrutiny device for smokers and it is identify smoker and also identify the smoking levels based on sensor input and give the indication through LEDs .

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