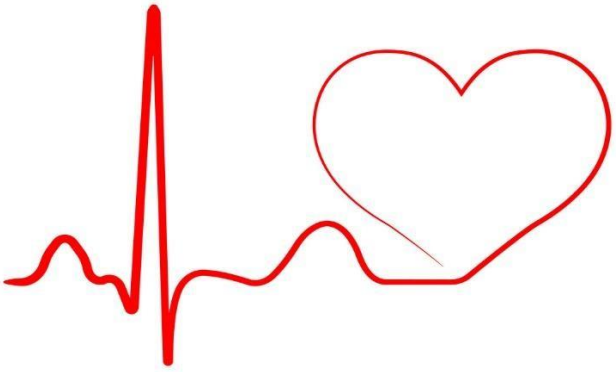
Global Academy of Technology

Department Of Electronics and Communication Engineering

Title: Feeling Sensing Audio Player

Let your heart play music



V Semester
Academic Year: 2019-2020

Participants : Gokul.Sai R_(USN : 1GA17EC41)

Rakshith.R.Bharadwaj_(USN : 1GA17EC106) Abhishek.M_(USN : 1GA17EC172) Gowrav.S_(USN : 1GA17EC42)

Acknowledgement

We as a group (Gokul Sai R, Gowrav S, Rakshith R Bharadwaj and Abhishek M) would like to thank the college management, Principal Sir and our placement coordinator Dr. Geetha Prakash ma'am for organizing **OPEN DAY** event at our college, which gave us a platform to exhibit our talents. We would also like to thank our **ECE dept** for helping us in providing us a good support and requirements for the completion of our project.

Title: Feeling Sensing Audio Player

Let your heart play music

Abstract

Music ,The word itself sounds to be magical !.It is said to be a god gifted art to earthly creatures .We live in a hive of activity and spaced out environment ,where music is the only source of our relaxation. A human brain will always like to hear music based on his/her mood. Manually changing songs according to mood could be terribly tedious.So we have designed a feeling sensing audio player which plays music based on their mood.

Contents

Introduction

A human heart is an important organ of an individual's body. It also plays an important role in extraction of human behavior and emotional state.

Based on study of human heart and psychology ,The human heart beat varies according to his emotions and activities, From our several physical observations a human heart beats faster when the person is scared ,angry or while exercising ,and those people crave for some motivational songs or energetic songs and a person's heart is said to beat slow only when the person is sad or when he is resting, and thus the person would crave for some peaceful and soft music\songs.

Our heart rate based music player is an interactive and innovative based device which helps you play music according to your mood from the created playlist in a device.

The application works in different manner from normal, because it reads the varied inputs and plays the songs according to provided parameters.

Extracting the desired input from human heart now can be done by employing a heart rate sensor, our system monitors the input consequently and plays song according to the collected data of varying mood.

Components

- **Heart beat sensor:** main key to this project.it provides the data of pulse beat , The heart rate sensor **measures your heart rate in Beats per Minute** using an optical LED light source and an LED light sensor. The light shines through your skin, and the sensor measures the amount of light that reflects back. The light reflections will vary as blood pulses under your skin past the light.

- **Speaker :** Used to output the song pertaining to the heart beat.

➔ **SD-Card Shield (Configured in SPI Protocol) :**

Serial Peripheral Interface (SPI) is an interface bus commonly used to send data between microcontrollers and small peripherals such as shift registers, sensors and SD cards. It uses separate clock and data lines, along with a select line to choose the device you wish to talk to. This is used to output the appropriate pre stored message in the SD card, the SD card shield is used to covert the WAV file (message) to TTL logic suitable for Arduino to read and is then output through the speaker.

➔ **Arduino-UNO:** Used to control the operation from the heart beat sensor(input) to the speaker(output). It is a microcontroller board. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0), a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

Methodology

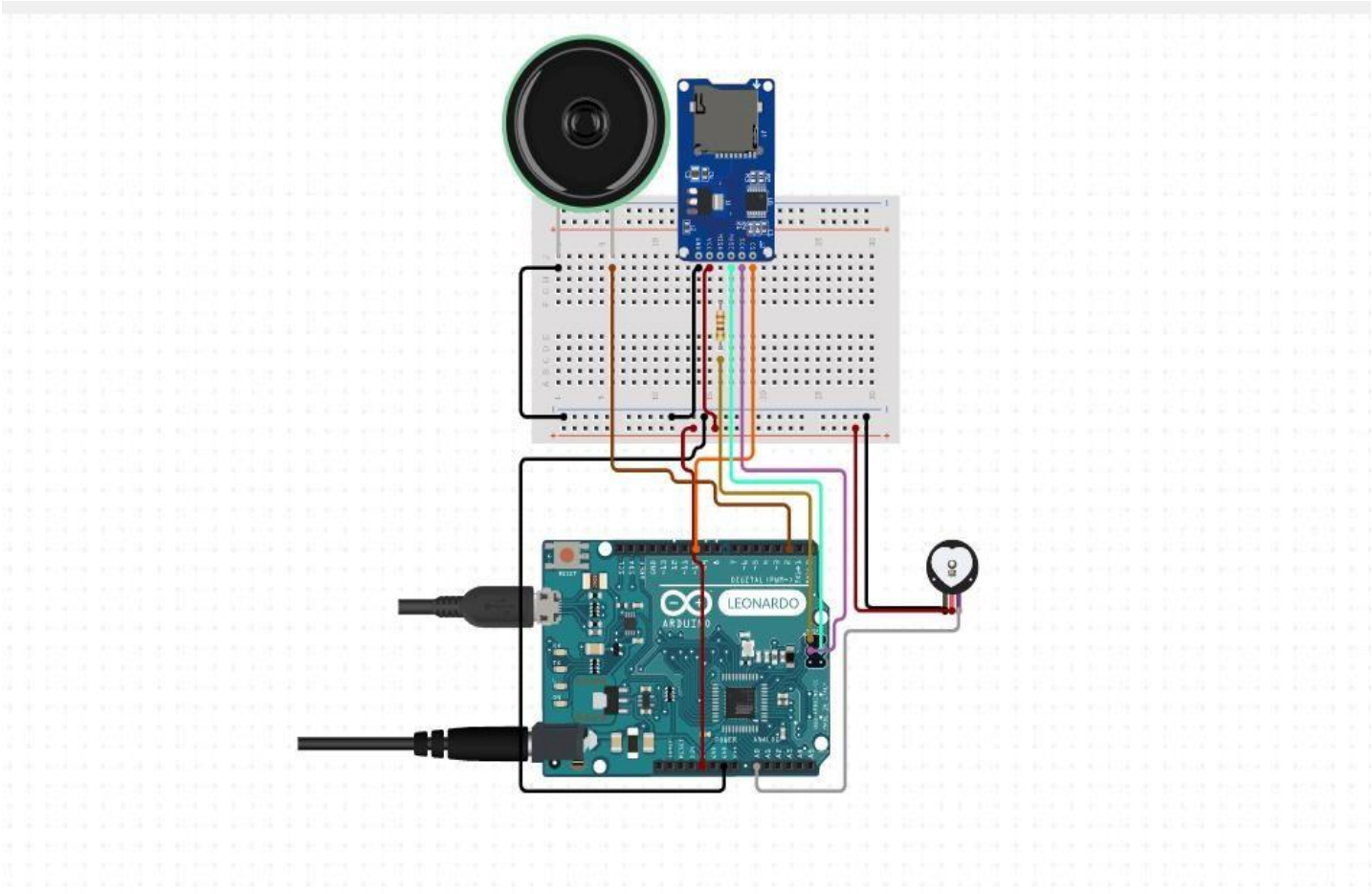
- ➔ Feeling of a human changes the according to their activities .We know the feelings of a person impacts directly or indirectly onto his/her heart beat .This changes the pulse beat per minute directly or indirectly depending upon his/her feelings.

- ➔ So we will be detecting the heartbeat of a person using the heart rate sensor and depending on his/her heartbeat his/her feeling will be decided.

- ➔ Based on the feelings of the person we will chart the appropriate songs playlist and this playlist will be played automatically depending upon his/her mood which will be detected.

- ➔ The audio songs being played are analog in nature and so for a microcontroller it is difficult to understand and process the analog signal ,so we employed sampling of the analog signal at nyquist rate i.e..(fc=2fm) to get 8 bit digital output .This sampled output is then applied to built-in DAC of the arduino and processed further by running our programed device.

Circuit Diagram



Program

```
#include <SD.h>                       // need to include the SD library
#define SD_ChipSelectPin 4 //using digital pin 4 on arduino nano 328, can use
other pins
#include <TMRpcm.h>           // also need to include this library...
#include <SPI.h>

TMRpcm tmrpcm;   // create an object for use in this sketch

int bmp;
int A0;
void setup(){

  tmrpcm.speakerPin = 9; //5,6,11 or 46 on Mega, 9 on Uno, Nano, etc
  pinMode(A0,OUTPUT);
  Serial.begin(38400);
  if (!SD.begin(SD_ChipSelectPin)) { // see if the card is present and can be
initialized:
    Serial.println("SD fail");
    return;   // don't do anything more if not
  }
  //tmrpcm.play("intro.wav"); //the sound file "music" will play each time the
arduino powers up, or is reset
}



void loop(){
 bmp=map(A0,0,158,0,255);
 Serial.println(bmp);
    if((bmp<=85)&&(bmp>=68))
    {
      normal();
      }
     if((bmp<=68))
    {
```

```
      sad();
      }
      if((bmp<=85)&&(bmp>=68))
    {
      angry();
      }



}
    void angry()
    {
      tmrpcm.play("angry1.wav");
      delay(1000);
      tmrpcm.play("angry2.wav");
      delay(1000);
      tmrpcm.play("angry3.wav");
      delay(1000);
      tmrpcm.play("angry4.wav");
      delay(1000);
      tmrpcm.play("angry5.wav");
      delay(1000);
      }
  void sad()
    {
      tmrpcm.play("sad1.wav");
      delay(1000);
      tmrpcm.play("sad2.wav");
      delay(1000);
      tmrpcm.play("sad3.wav");
      delay(1000);
      tmrpcm.play("sad4.wav");
      delay(1000);
      tmrpcm.play("sad5.wav");
      delay(1000);
      }
   void normal()
    {
      tmrpcm.play("music1.wav");
```

```
delay(1000);
tmrpcm.play("music2.wav");
delay(1000);
tmrpcm.play("music3.wav");
delay(1000);
tmrpcm.play("music4.wav");
delay(1000);
tmrpcm.play("music5.wav");
delay(1000);
}
```

Problems faced

- ➔ We tried making our system go wireless by using Bluetooth module ,we failed in making wireless due to lack of availability of authenticated **ascii** values.
- ➔ We faced a disturbance from external source like **white noise ,EM radiation noise** during the time of input which affected our input values .we overcame this hurdle with a rubber insulation around the sensor.
- ➔ We had to convert songs to (**.wav**) format which consumes lot of memory.

Improvements we would like to work on

- ➔ To go wireless.
- ➔ We would like to implement heart rate sensor to gadgets like Watch\Band.
- ➔ We would like to provide many customization option to user to make it user friendly
- ➔ We would like to develop an app which constantly monitor user's and also a create a cloud containing songs that user like to hear.
- ➔ We would like to develop a security alert for heart health of user.
- ➔ We also want to work on our project to help people suffering from many mental disorders from music therapy.

Achievements

Our project **won Second place(2nd)** in **OPEN DAY COMPETITION** held on NOVEMBER (2019) at **Global Academy of Technology ,Bengaluru.**

- **Our ancestors used to say a good Music/Song is always played/sung by good heart only, so let your heart play music.**

-Thank you