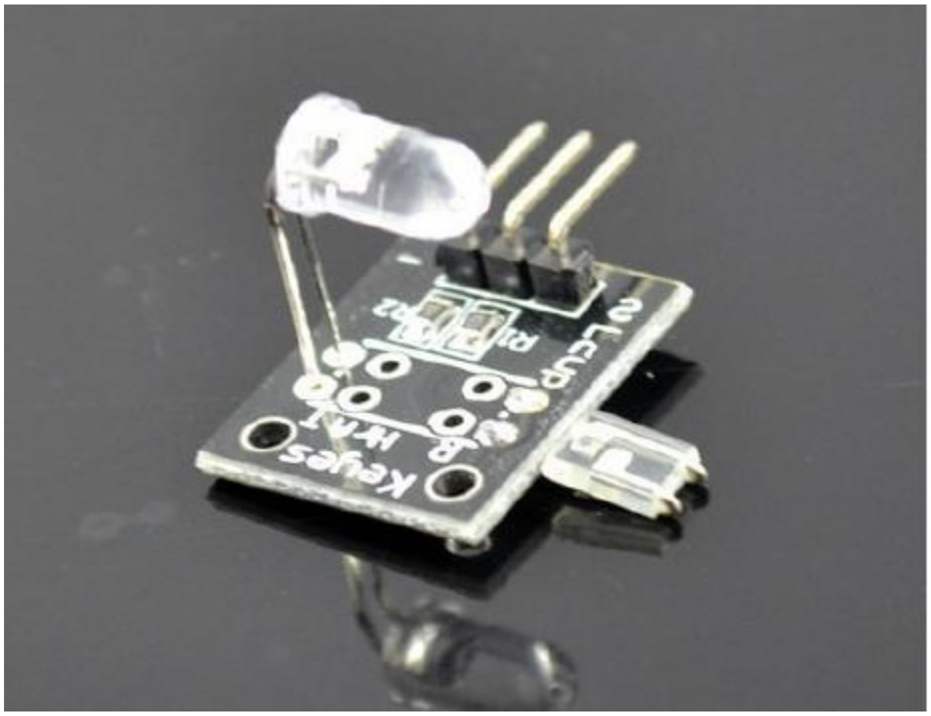
Finger Measuring Heartbeat Module



THIS GUIDE RECCOMENDED FOR ADVANCED ARDUINO USERS ONLY

To begin, I would not recommend buying this sensor. I could not get it to work, and I have not found anybody else who has. That said, if you already have this sensor and insist on messing with it, hopefully I can save you some time.

The sensor is made to shine an infrared led through your finger. The infrared sensor on the other side can then pick up slight changes in the light transmittance through your finger when blood is pumped in. When the sensor senses light, it becomes more resistant, causing the voltage reading in the serial monitor to go down. However, if your sensor is anything like mine, the LED is not bright enough to be detected by the sensor even when nothing is obstructing it, so the sensor constantly reads 5v. I tried replacing the LED with a stronger one and got slightly better results, but I don't think the sensor itself is sensitive enough to be able to detect a heartbeat over random noise and movements. You could try replacing the sensor as well, but then you've just replaced the entire module. Continue as you see fit.

The sensor is a simple 3-pinned analog sensor. Plug the ground in the -, the 5v to the middle pin and A0 to the S pin.

Code:

The code to program the Arduino and measure the voltage output is below. However alone it does not do much good. It is difficult to see any patterns in the numbers that flash by. I highly recommend downloading the programing "Processing" and running it in tandem. Processing will take the readings from your serial monitor and graph them in an easy to look manor. Full instructions can be found here.

http://www.youtube.com/watch?v=2_c0yE9QHNI

Special thanks to that link for the great instructions and code.

Arduino Code

```
// Pulse Monitor Test Script

int ledPin = 13;

int sensorPin = 0;

double alpha = 0.75;

int period = 20;

double change = 0.0;

void setup ()

{

pinMode (ledPin, OUTPUT);

Serial.begin (9600);

}void loop ()

{

  digitalWrite(13, HIGH);

static double oldValue = 0;

static double oldChange = 0;

int rawValue = analogRead (sensorPin);
double value = alpha * oldValue + (1 - alpha) * rawValue;

Serial.print ((((value*value)-100000)-942000)/10);

Serial.println ((((value*value)-100000)-942000)/10);

oldValue = value;

delay (period);

}
```

Processing Code

```
import processing.serial.*;



Serial myPort;  // Create object from Serial class

int val, screen_increment, old_x=0, old_y=0;      // Data received from the serial port

String inString;  // Input string from serial port

int lf = 10;      // ASCII linefeed

void setup()

{



  size(displayWidth-100, 600);//screen size setup, display width is read into teh program, and I

  //clipped it a little bit.  The screen height is set to be 600, which matches the scaled data,

  //the arduino will send over

  String portName = Serial.list()[0];//Set the Serial port COM or dev/tty.blah blah

  println(Serial.list());//look inthe console below to determine which number you put in



  myPort = new Serial(this, portName, 9600);//Set up the serial port

  myPort.bufferUntil(lf);//read in data until a line feed, so the arduino must do a println
  background(208,24,24);//make the background that cool blood red

}//setup


void draw()

{

//nothing in here, this is kind of like the void loop in arduino

}


void serialEvent(Serial myPort) { //this is called whenever data is sent over by the arduino


  inString = myPort.readString();//read in the new data, and store in inString

  inString = trim(inString);//get rid of any crap that isn't numbers, like the line feed

  val = int(inString);//convert the string into a number we can use

  strokeWeight(12);//beef up our white line

  stroke(255, 255, 255);//make the line white


  //here's where we draw the line on the screen

  //we need to draw the line from one point to the next

  //so we have the point we last drew, to the new point

  //values are written as an x,y system, where x is left to right, left most being 0

  //y is up and down, BUT 0 is the upmost point,

  //so we subtract our value from the screen height to invert

  //screen increment, is how we progress teh line through the screen

  line(old_x, old_y, screen_increment, 600-val);


  //store the current x, y as the old x,y, so it is used next time

  old_x = screen_increment;
  old_y = 600-val;


  //increment the x coordinate,  you can play with this value to speed things up

  screen_increment=screen_increment+2;


  //this is needed to reset things when the line crashes into the end of the screen

  if(screen_increment>(displayWidth-100)){

    background(208,24,24); //refresh the screen, erases everything

    screen_increment=-50; //make the increment back to 0,

    //but used 50, so it sweeps better into the screen

    //reset the old x,y values

  old_x = -50;

  old_y = 0;


  }// if screen... blah blah


}//serial event
```