

CS244 Team 15 Project – Assignment #6

1. Code:
GitHub link: <https://github.com/xiaoyanqu/CS244Fall2017/tree/master/Assignment6>
2. Produced file:
Please see file “team15_assignment6.csv” in the above GitHub link.
3. Report:
Please see below the snapshot of the data recording process:

```
101 //
102 // Serial.print(", BPM=");
103 // Serial.print(beatsPerMinute);
104 // Serial.print(", Avg BPM=");
105 // Serial.print(beatAvg);
106
107 // if (irValue < 50000)
108 // Serial.print(" No finger?");
109
110 // Serial.println();
111
112 String reading = "&ir=" + ir + "&red=" + red + "&x=" + x + "&y=" + y + "&z=" + z;
113
114 if (WiFi.status() == WL_CONNECTED) {
115     WiFiClient client;
116     const int httpPort = 80;
117
118     if (!client.connect("169.234.51.114", httpPort)) {
119         Serial.println("Server connection failed");
120         return;
121     }
122     String curTime = String(millis());
123     Serial.println("Time : " + curTime);
124     reading = "time=" + curTime + reading;
125     String url = "GET /data.php?" + reading + " HTTP/1.0";
126     client.println(url);
127     client.println();
128     client.stop(); //Stopping client
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

5: Task - Monitor + - ^ x

```
IR = 115627 R = 106997 X = 0.03 Y = -0.03 Z = 1.03
Time : 665000
IR = 115717 R = 107026 X = 0.03 Y = -0.03 Z = 1.03
Time : 667069
IR = 116984 R = 107635 X = 0.01 Y = 0.00 Z = 1.04
Time : 667121
IR = 116812 R = 107527 X = 0.03 Y = -0.01 Z = 1.03
Time : 667162
IR = 116637 R = 107504 X = 0.04 Y = -0.01 Z = 1.03
Time : 667205
IR = 116583 R = 107492 X = 0.03 Y = -0.04 Z = 1.04
Time : 667257
```

And here is the snapshot of the csv file we got out of the report.log file:

	A	B	C	D	E	F	G	H
1	TimeStamp	IR	RED	X	Y	Z	Activity	
231	21313	142015	99581	0.03	-0.03	1.04	5	
232	21410	142084	99571	0.03	-0.03	1.04	5	
233	21519	142166	99621	0.03	-0.03	1.04	5	
234	21609	142256	99666	0.03	-0.02	1.03	5	
235	21715	142370	99681	0.03	-0.02	1.04	5	
236	21825	142450	99704	0.02	-0.02	1.03	5	
237	21896	142370	99628	0.03	-0.03	1.03	5	
238	22007	142233	99617	0.03	-0.03	1.03	5	
239	22073	142200	99574	0.03	-0.03	1.04	5	

Calculate heart rate:

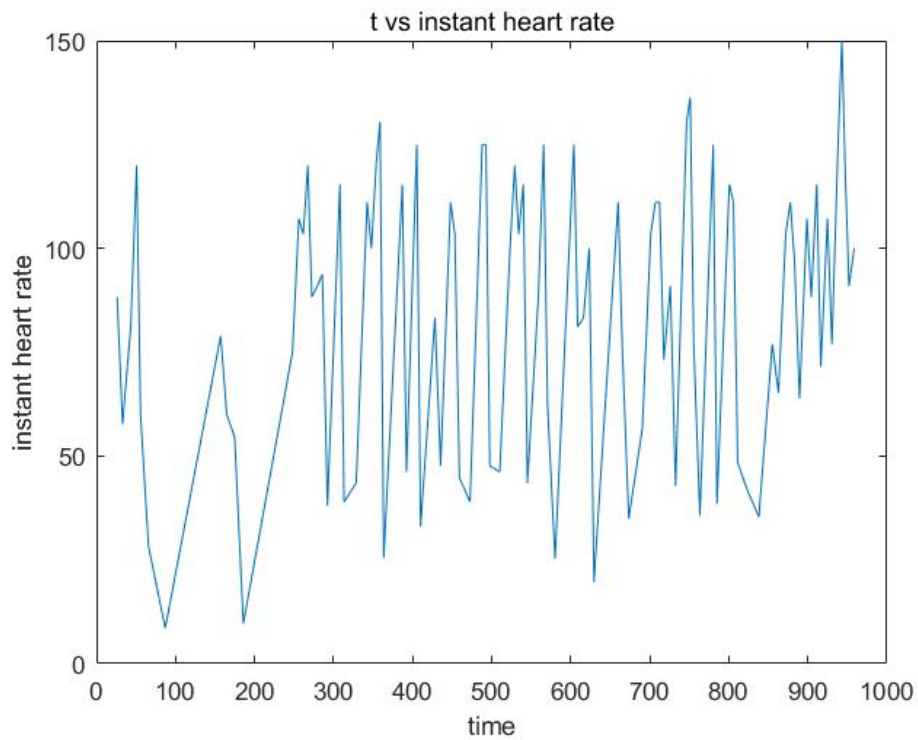


Fig. 2 Instant heart rate

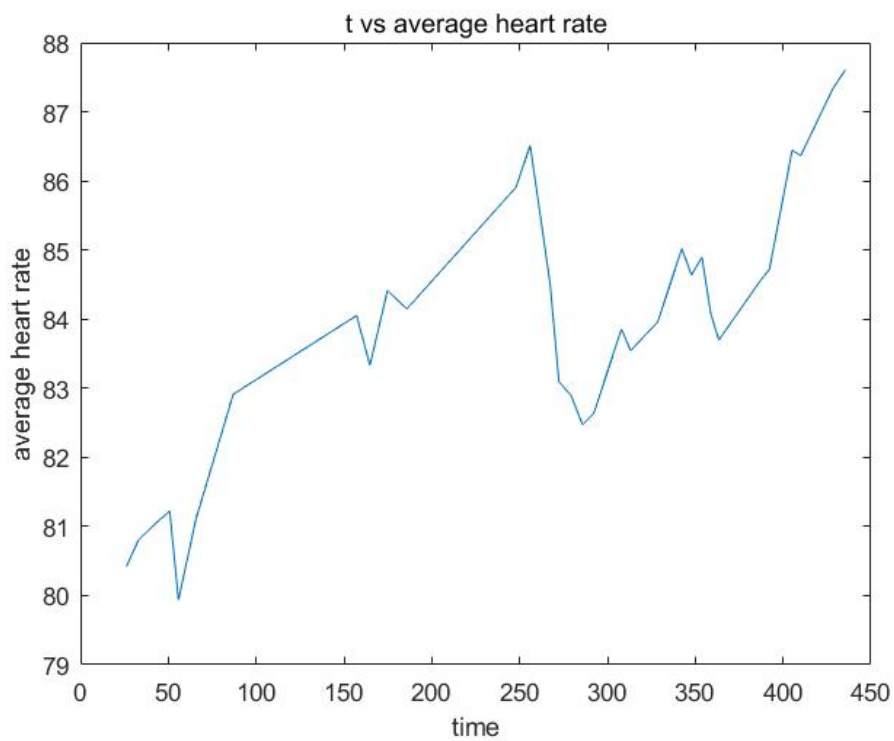


Fig. 3 Average heart rate

Also, we found that the heart rate average = 82.8761 amongst all heart rate data.

Calculate respiration rate:

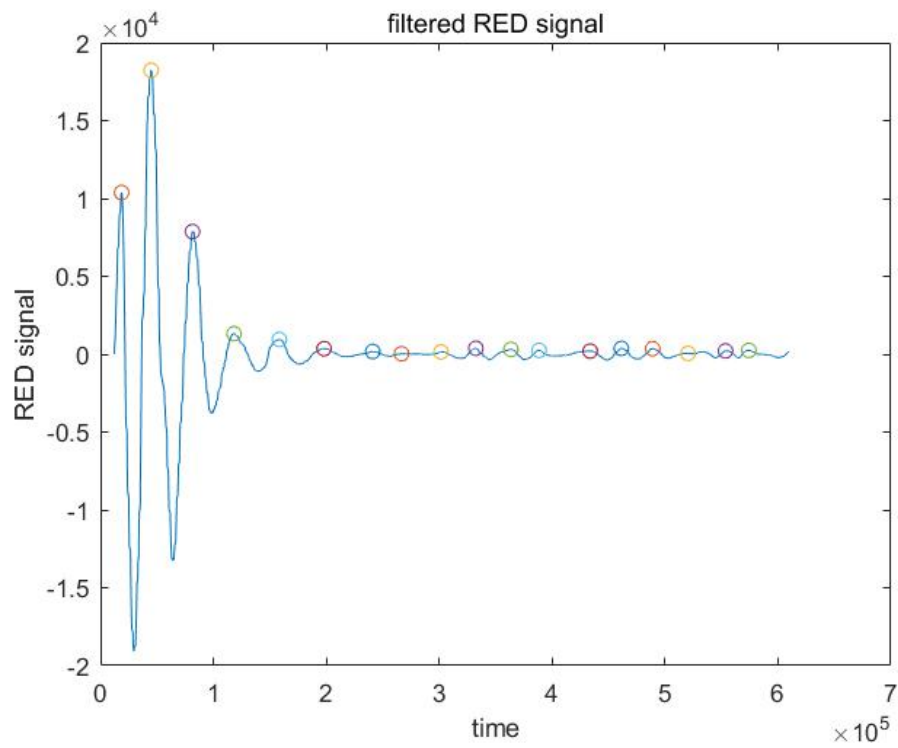


Fig. 4 Filtered RED signal vs time (peaks labeled as 'o')

Calculate SPO2

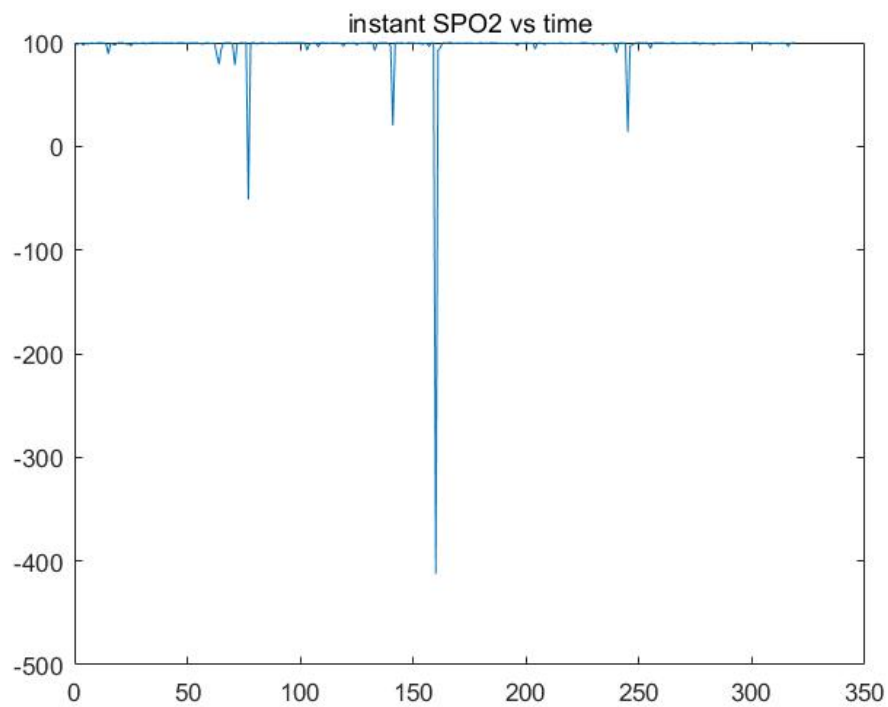


Fig.5 Instant SPO2 vs time(from 50th point)

Fig. 5 shows the change of instant SPO2 value over time. Also, we calculate that average value of SPO2 = 96.4724%.

Here we start from 50th point to the last point to calculate average value as the first few data are not stable.

Calculate the error rate:

During the whole 10 min test, we were basically sitting like a stone and didn't move at all, so the accelerator was reading pretty steady numbers along the way. Thus, we got the error rate calculated as 0, choosing three different window sizes, i.e. 50, 100, 150.