Heart rate measurement – ECG

An effective way to analyse and monitor your heart rate is through an ECG (Electrocardiogram).

Make things smarter rather than using high end machines, devices for checking bp, heart rate etc.

Here, we will see how can we develop and run the AD8232 heart rate monitor by showing you how to connect it to an Arduino UNO to create heartbeat visualizations using Processing 2.2.

Brief on AD8232

It is a Single-Lead, Heart Rate Monitor i.e., it measures electrical signals in our body. This electrical signal can be expressed as an ECG. ECG has been popularly used to help diagnose various heart diseases.

Brief on ECG

The human heart is a muscle like most others in the human body. Upon receiving an electrical impulse, it will tense up and then relax once that electrical signal is removed. However, unlike most muscles in the human body which rely on nerves from the brain for control signals, the heart contains its own electrical system for controlling the pumping action. When the heart beats, it generates a potential difference which is large enough to be detected by electronics and this is what our circuit detects.

Circuit:

Required Hardware	***Required Software***	***Required Expense***
• Arduino UNO • AD8232 ECG module • ECG electrodes (3) • ECG electrode connector - 3.5 mm • Data Cable • Jumper Wires • Breadboard	• Arduino IDE • Processing 2.2.1	• Uno-5$ • AD8232-2.5$ • Electrode-0.5$ • Extras-1$ Total: 9$

Make things easier

The idea is to get the ECG signal from the AD8232 board. The output signal of the AD8232 is approximately 1.5 volts. This signal will be sampled by the Arduino UNO at approximately 1k samples/second. Then these sampled values are sent to the PC for visualization via the USB port.