EE 4BD4 2015

Notes for Lab 2

Processing the ECG signals to Produce a Vectorcardiogram

In the lab you have collected the 3 Leads of ECG, <u>but they are for three different data collections</u> since we only have a single channel of isolated signal on the interface board. To produce a reasonable vectorcardiogram you must write a Matlab program that lines up the ECG complexes in each of the three data collections. I would suggest the following sequence:

1. Read in the Lead I signal and identify where the ECG complex starts (the beginning of the P-wave) or identify the peak of the QRS wave if the start of the P-wave is difficult to identify and go back sufficient samples to make sure you've included the beginning of the P-wave
2. Read in the Lead II signal and find the P-wave or peak of the QRS and use this to line up the Lead II with the Lead I signal
3. Do the same for Lead III.
4. Obtain the vector cardiogram for only one heartbeat (i.e. the beginning of the P-wave to the end of the T-wave). In a resting individuals ECG the ECG complex won't change from heartbeat to heartbeat but the instantaneous heart-rate can change. If you have lined up the ECG signals properly as above, the first complexes will line up but the next and following probably won't.

The points 1 to 3 above may take a bit of Matlab coding. An easier way would be to identify the sample numbers that give you a complete ECG complex and lining them up for each collection would be inspecting each signal using Microsoft Excel (the output of the program is Excel compatible) and identifying the starting sample for each Lead and the number of samples that give you a complete complex.