Introduction

The purpose of this lab was to begin to familiarize ourselves with recording and processing biological signals. In this case, we recorded the human electrocardiogram. Learning to record signals properly is important, as that is the first step where the signal can be distorted. Then, it must be ensured that the frequency and voltage recorded by the equipment must be as close to the actual values as possible. For this reason, the lab began with an exploration of aliasing, a phenomenon where the recorded frequencies begin to decay relative to the actual frequencies after the actual frequency passes the Nyquist frequency, or one half the sampling rate. This can cause a problem by misrepresenting frequencies that approach the sampling rate.

Next, the lab moved to signal processing. This involves filtering and analyzing the signal data such that useful information can be gleaned. This step is vitally important to understanding the data. There are only certain parts of a signal that are useful, and once the signal has been cleaned, then a careful analysis can provide things like a measure of heart rate, or even reveal pathologies in the patient's cardiac function. These are probably the two primary reasons for taking a patient's ECG, and are certainly very important in judging the overall health of a patient.

Using these techniques of signal recording and processing, we then ran our own experiment to determine if resting heart rates differed sitting in different positions, or 'postures.' This is of great interest to me, as I am constantly aware of my typically poor posture, and I would like to know if a certain way of carrying myself while sitting takes less cardiac exertion, and could potentially be more efficient and relaxing.