This project will expand upon a project from last year’s senior design class, which used photoplethysmography to monitor heart rate and blood oxygenation in order to detect the symptoms of cardiomyopathy. Cardiomyopathy, also known as enlarged heart syndrome, is the condition caused by the thickening of the heart walls, which constricts blood flow. This can lead to unexpected cardiac arrest. Since cardiomyography is not tested for in physicals, it often goes unnoticed. Our version will retain the functionality of last year’s project while adding several new features. By adding an additional AFE4490 chip and more LEDs, we hope to be able to detect additional wavelengths reflected by particles in the blood, which will allow us to test for the concentrations of additional types of molecules. We also hope to add an accelerometer, which will report to the microcontroller if the board is in movement in order to adjust for any noise the movement added. Finally, we hope to add wireless communication functionality to the board, so data can be stored in real time to another device without the need for physical storage on the board.

The first step to completing this project is to get the final board design from last year to work. After the board was demonstrated it was redesigned to be much smaller and add some functionality. This board is untested and will likely have errors that will need to be corrected before any progress can be made.

Key features added:

* Varied wavelengths to detect different types of molecules
  + Requires additional AFE chips
* Accelerometer to detect motion and adjust for the added noise
* Wireless communication to document data