**Documentation**

This document covers a summary of the usage of the code for analysing a heart sound recording for an aortic stenosis murmur based off of the metric ‘systolic to diastolic amplitude ratio’. The script and functions themselves contain many comments thus I will mainly cover the order of the functions and which scripts to run.

**Scripts**

***main***

This is the main script (calling all functions) that will run through 2 folders of heart sound recordings, one with healthy recordings and the second with AS murmur recordings. It will return the area under the ROC curve and perform the functionality of a classifier.

WARNING – this will take 1-2 hours to run.

***runOneRecording***

This is a script that will run through all the functions but only for 1 heart sound recording. Obviously, this will not classify the recording but return metrics such as systolic to diastolic amplitude ratio.

**Functions**

This list will cover all functions used in the algorithm in order of use:

1. ***finalFunction*** = main function that call all other functions for use in *main* script
2. ***murmurRemoval*** = filters and processes data as well as removes murmur
3. ***hilbertAndFindPeaks*** = Hilbert transform as well as peak and boundary detection
   1. ***S1\_or\_S2*** = takes times of peaks and classifies them into S1 or S2 (called inside *hilbertAndFindPeaks* function)
4. ***AcceptableWindows*** = returns number of 'acceptable’ heartbeats (used as a metric for the decision of the best parameter value for *findPeaks* function)
5. ***CalculateAmplitude*** = calculates mean systolic and diastolic amplitudes
6. ***AmplitudeMetrics*** = simple function that returns systolic-to-diastolic ratio as well as average systolic and diastolic amplitudes