

EE513 Quiz 2

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1 Part 1

The average heart rate over the 30s clip is shown in Fig. 1.

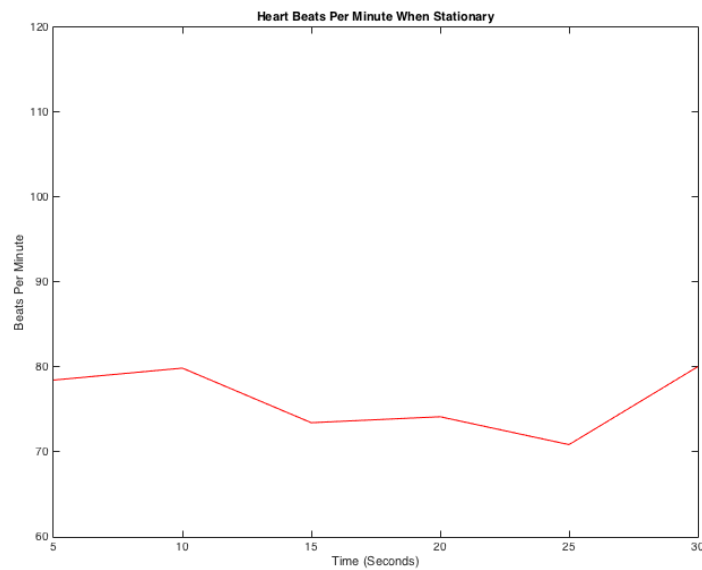


Figure 1: Heart rate while resting.

2 Part 2

The average heart rate over the 120 second clip recorded after climbing stairs is shown in Fig. 2.

3 Part 3

The annotated spectrogram showing the periods of fast and slow blood flow is shown in Fig. 3.

As the blood is pumped from the heart, it is at its highest speed. This creates the maximum Doppler shift, putting energy into the high end of the available spectrum. This is seen as the large spikes in the spectrogram.

As blood is returned back to the heart, another spike in speed occurs. It is lesser in initial velocity and thus causes less spectral smearing.

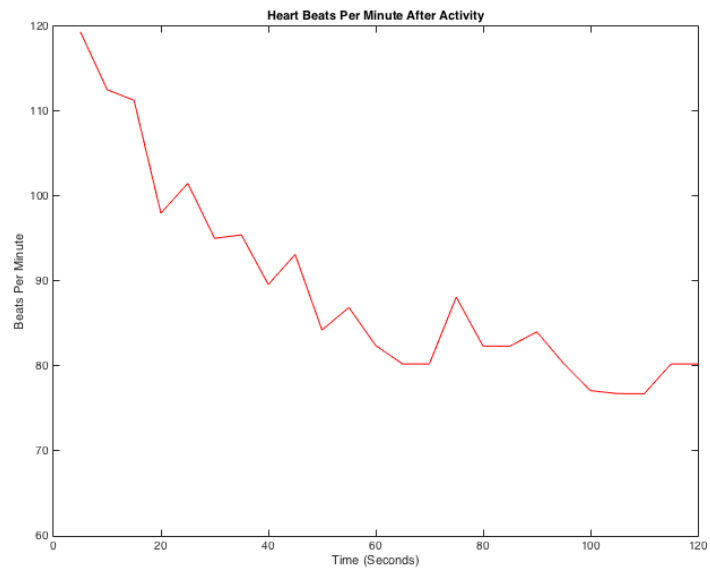


Figure 2: Heart rate after exertion.

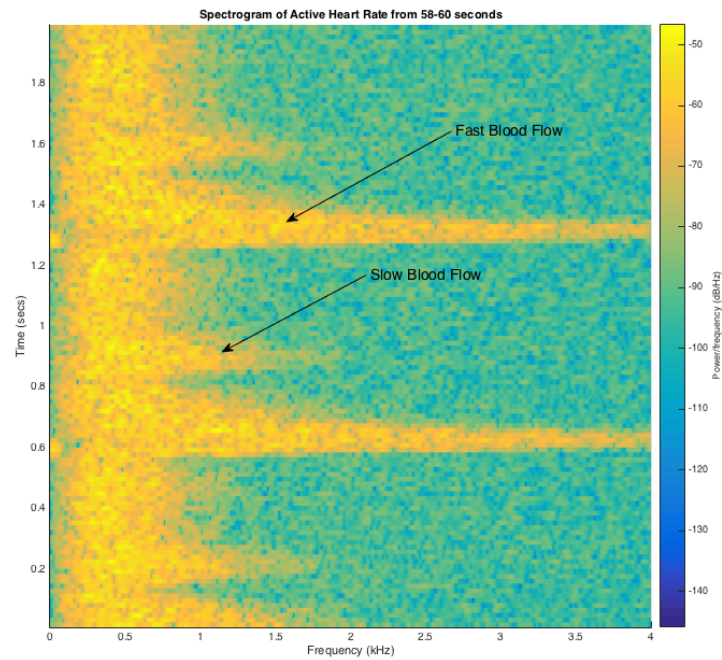


Figure 3: Annotated spectrogram showing fast and slow blood movement times.