**Lab 4: Title**

**Your Name**

Your Major,

Your Minor or Second Major (if applicable)

**ABSTRACT**

The usual stuff.

**METHODS**

1. Include a figure showing a system block diagram of the entire optical heart rate monitor system. Your diagram must include blocks for the *measurand*, *sensor*, *signal conditioning*, *data acquisition*, *signal processing*, and *display*. **The label for each block must include the basic function and the specific implementation**. For example, the *sensor* block should contain “Sensor (LED and photodetector)”.
2. Briefly describe the purpose of each section of the signal conditioning electronics (e.g. each amplifier and filter).

**EXPERIMENTS AND RESULTS**

Include the PPG waveform and photo of your working circuit.

**DISCUSSION**

1. Although the electronics was relatively straightforward, you probably found that it is not trivial to get a reliable and strong optical heart rate signal. Two major factors are (1) finger motion (2) mis-alignment between the LED and phototransistor. Describe a way to minimize these problems (e.g. what would a practical system do?).
2. Although we displayed a plot of the PPG signal, we never computed the actual heart rate! Explain how you would process the PPG signal to automatically calculate a heart rate. Include some details about your envisioned algorithm. For example, if you choose to do a time-domain approach (e.g. analyze the PPG signal directly), then how would your algorithm work? If you choose to do a frequency-domain approach (e.g. analyze the Fourier transform), how would your algorithm work?

**CONCLUSIONS**

The usual stuff.