



Heart Rate Monitor Design

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ABSTRACT

What is the heart rate monitor?

Heart Rate monitor is a device that measures the heart rate for a person in real time .

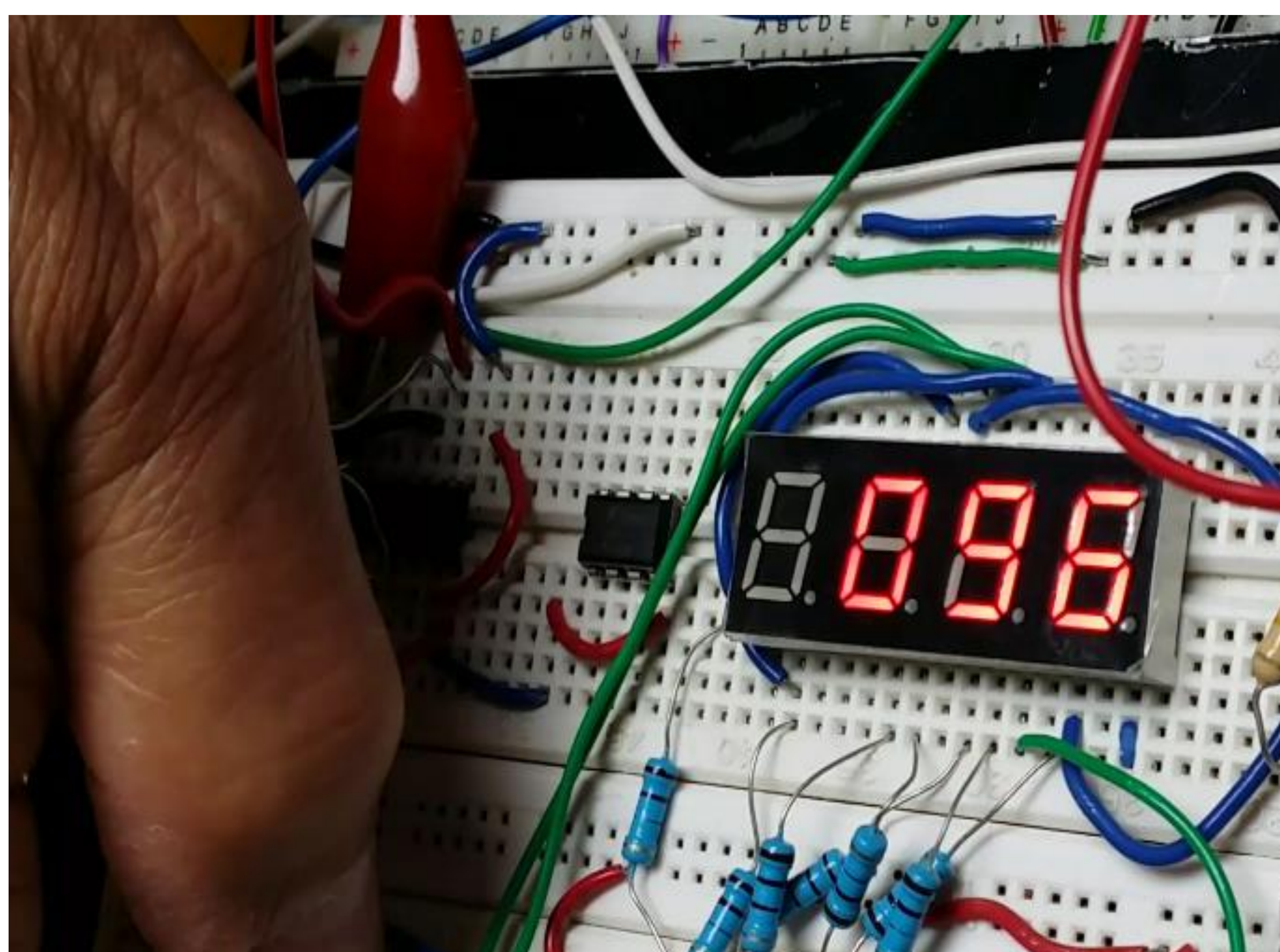
What do we want to do to achieve in this project?

In this project we want to monitor Heart Rate for a human being by our own design. To be specific applying the finger tip to a designed sensor using IR diodes and then to a stage of filters connected to an audio amplifier and a sound tone generator and speaker.

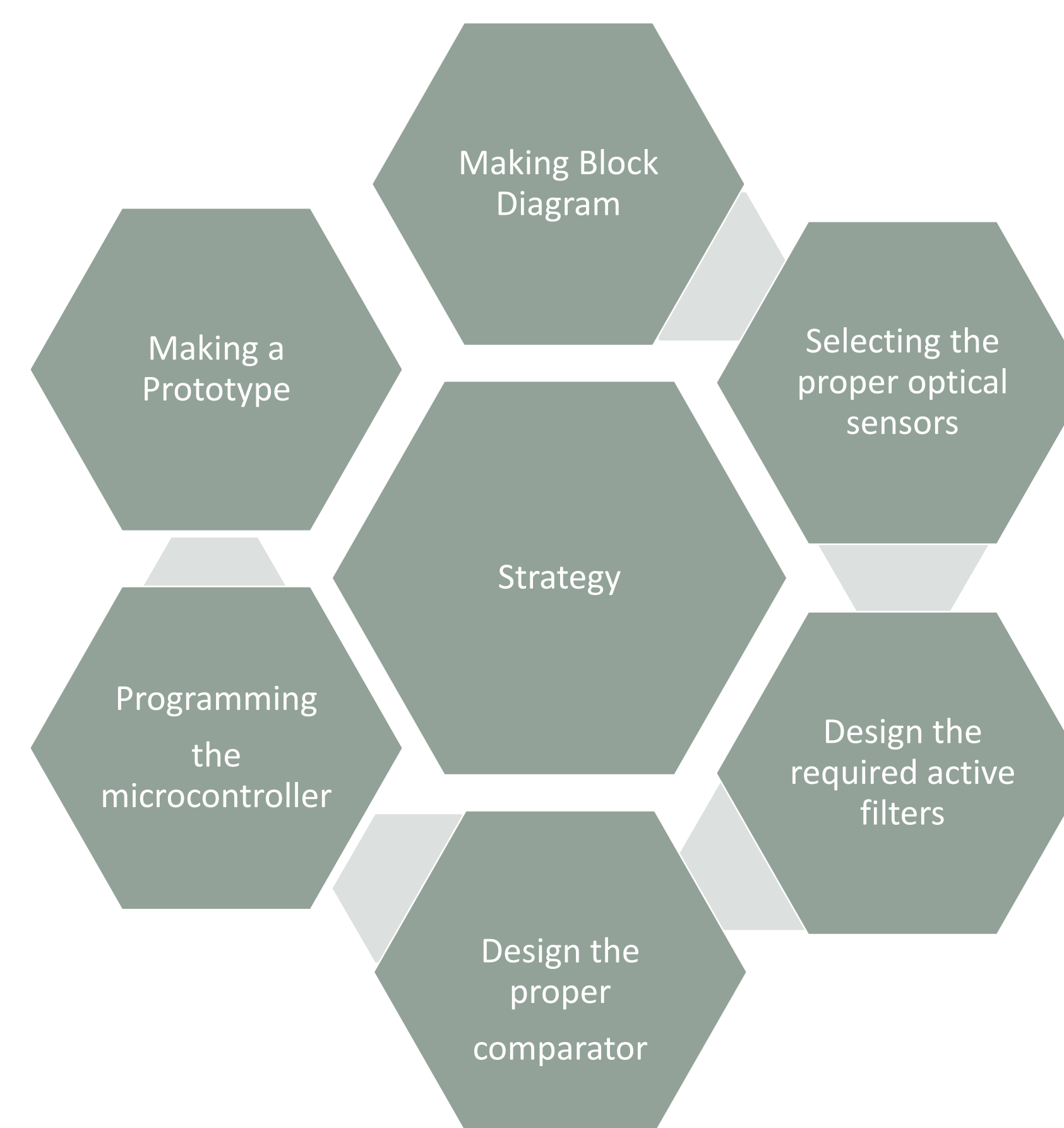
OBJECTIVES

- To apply the concept of active filtering especially low and band-pass filters.
- To apply the concept of oscillation.
- To make use of photonics.

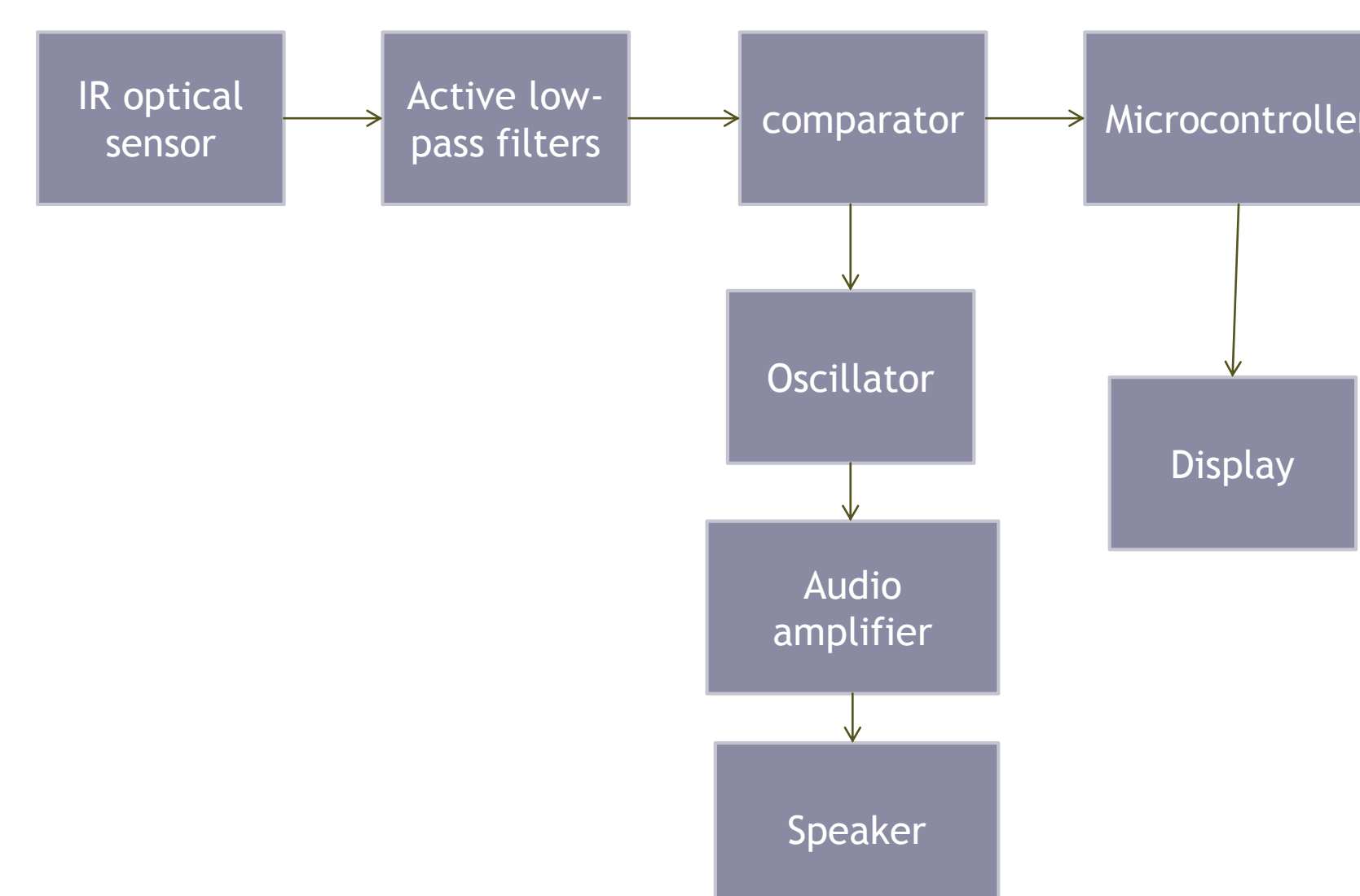
SAMPLE STAGE



METHODOLOGY

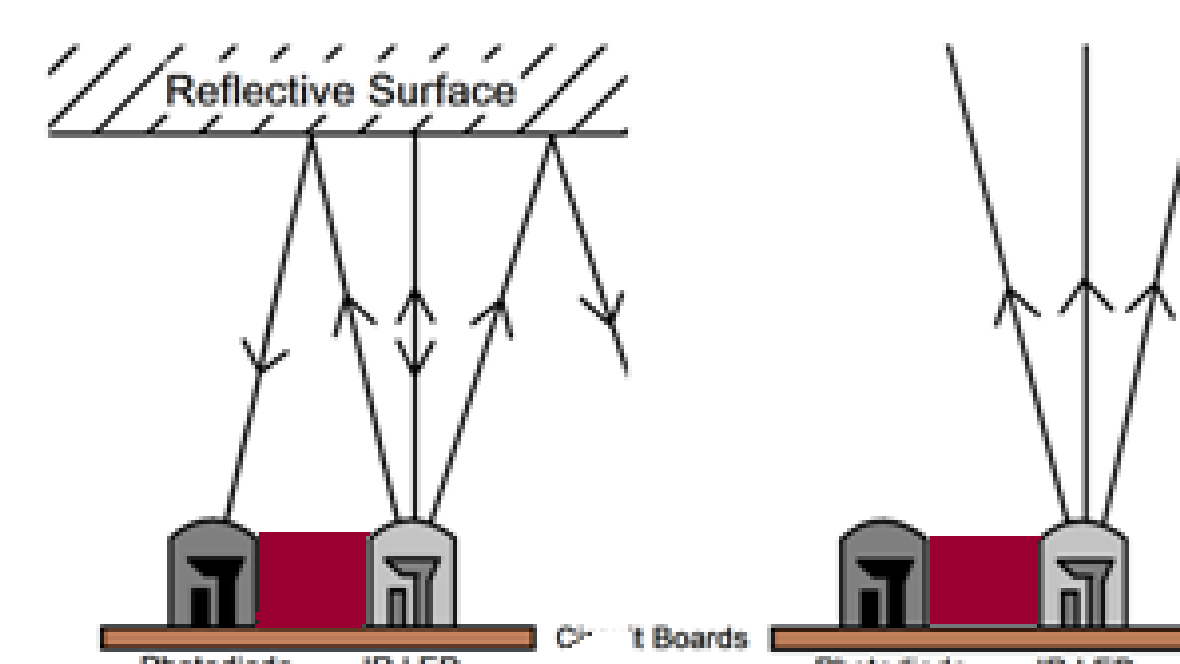


BLOCK DIAGRAM



PROBLEMS FACED

- The program of the microcontroller
- The sensitivity of the IR sensor
- The interference between various system circuits



RESULTS

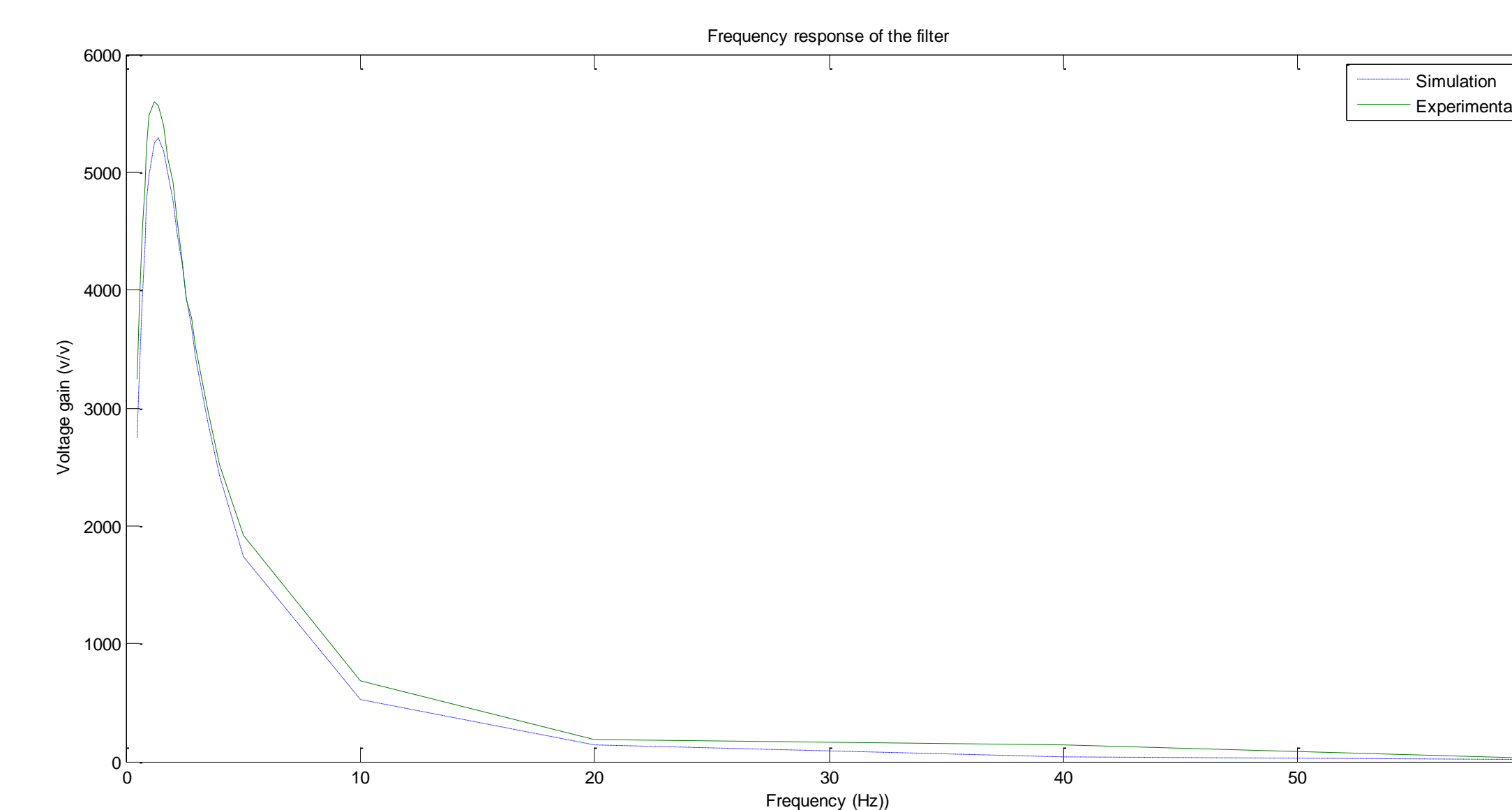


Figure 1 Frequency responses of simulation and experimental results of 4th order BP filter

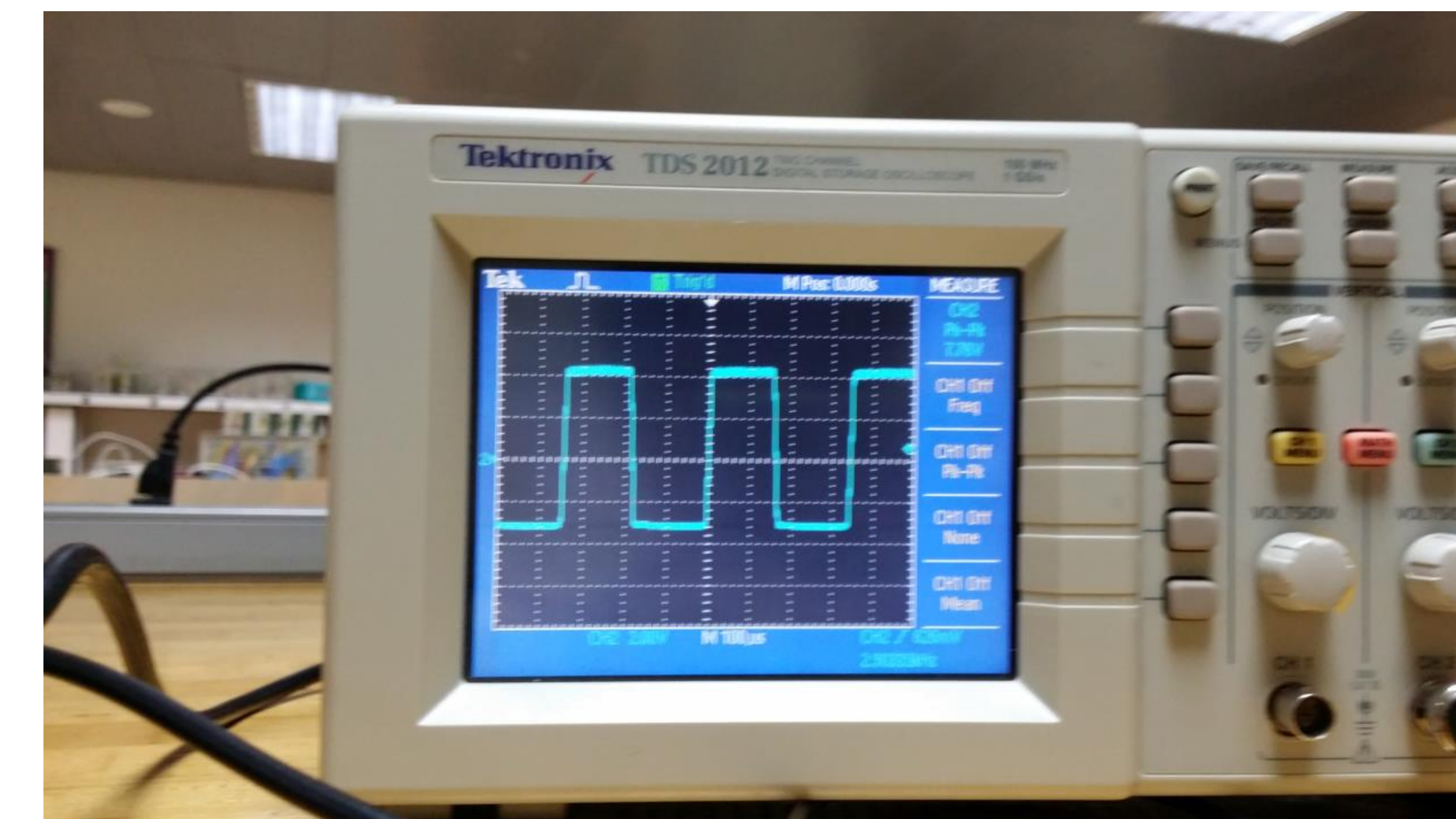


Figure 2 Square Wave Oscillation

CONCLUSIONS

Conclusions: The IR sensor returns values between 0.00 and 0.05 V. The design was based on the output of the IR sensor and the conditioning circuit connected to it. We used multistage filters to adjust the sensor output and interface it with a microcontroller unit. The microcontroller was used as a counter and a multiplier in order to display the output of our reading in the 4 digits display as beat per minute (bpm).The results we got from healthy people in normal condition are (60 -100 bpm) and in comparison with medical records is considered typically good