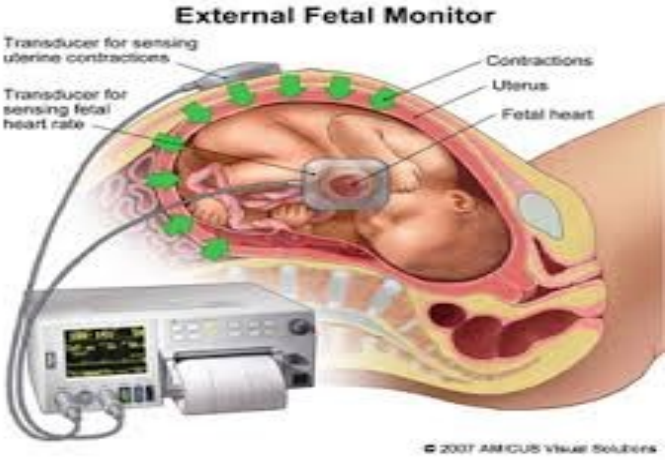
Foetal Heartrate Measuring Device

To develop a cheap, portable and easy to use heartrate mearurnment device, with enough presision to pick up foetal heartbeats when placed at specific portion of the body.



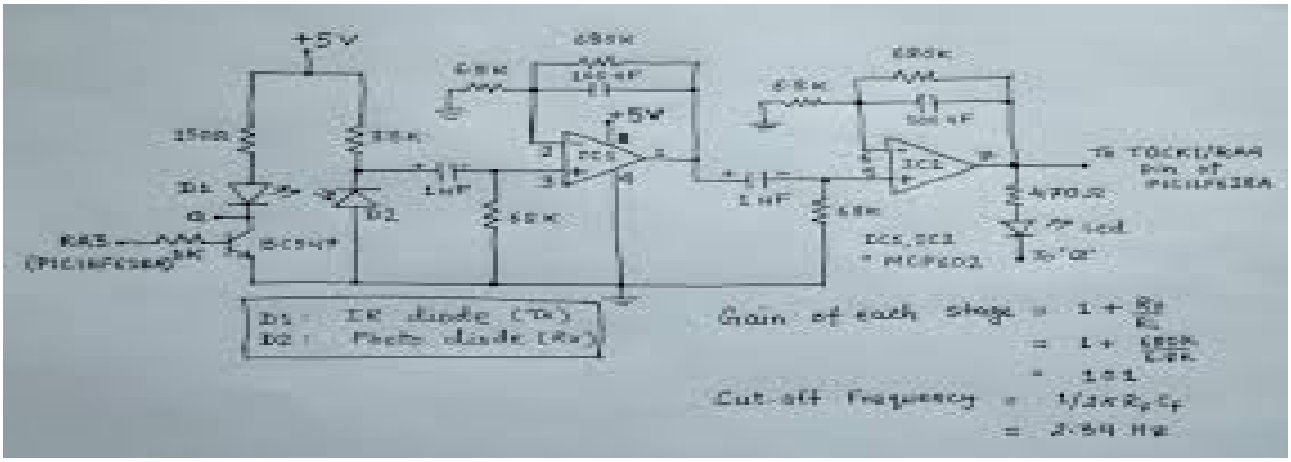
INTRODUCTION

The prime motivation behind this product will be to add to the convinience of the pregenent women and save doctor's time. The techniques avaliable for measuring and monitoring foetal heartrate are fairly sophesticated and are hugely performed by doctors and not the pregenent women themselves. The most common ways being a use of simple stehthoscope which is fairly difficult and paitients will not be able to do by themselves. The most trusted technology avaliable for foetal heartrate monotiring is a foetal doppler, but is quite expensive and not everyone can afford it.
Pregenent women are generally worried about their baby, and the uncertanity cause them to visit doctors frequently and unecessarly, this device will help both the doctors as well as paitients.

UNDERLYING CONCEPTS AND PROPOSED DESIGN

The basic concept of a stethoscope is used here, a steth placed in a particular place is able to pick up the foetal heartbeat. The bulb of stethoscope will be used to pick up better readings and at the bulb's end a small diaphragm will be attached. The heartbeats will cause the diagphram to viberate(very subtly) this viberations will be picked up by IR pair placed directly after the diagphram, then after series of filters and counters we can get a count on the number of viberations and hence the heartbeat. Normal human heartrate is 70beats/min wheres a normal foetal heartbeat is 160beats/min and therefore there is no preoblem in distinguishing the heartbeat.

The normal heart rate counter using IR sensor circuit is as shown. Similar pulsations would be a result from the diagphragm viberations



COMPONENTS REQUIRED

One of the primary motivation of this product is to make the final product cheap enough for public usage. So I will use basic electronic components to do this project.

1) IR sensors or microphone for viberation detection
2) Opamps and other amplifiers
3) A stethoscope head
4) Segment displays
5) Other consumables
6) Fabricating material

The rough cost estimation would be around 700 rupees, but the final product will be much cheaper.

TIMELINE

I am avaliable throughout the summers, and I plan to finish the project as quickly as possible.

30st April - 10th May : Will finalize the design of getting viberations, amplify it and test it for the normal heartbeats.
11th May to 13th May: I will be going home, and as my mom is a gynecologist I will get a chance to check it for foetal heart rate.
13th May – 23th May: Troubleshooting and cost reduction and front end finalization.
23th May to 30th June: Fabrication.