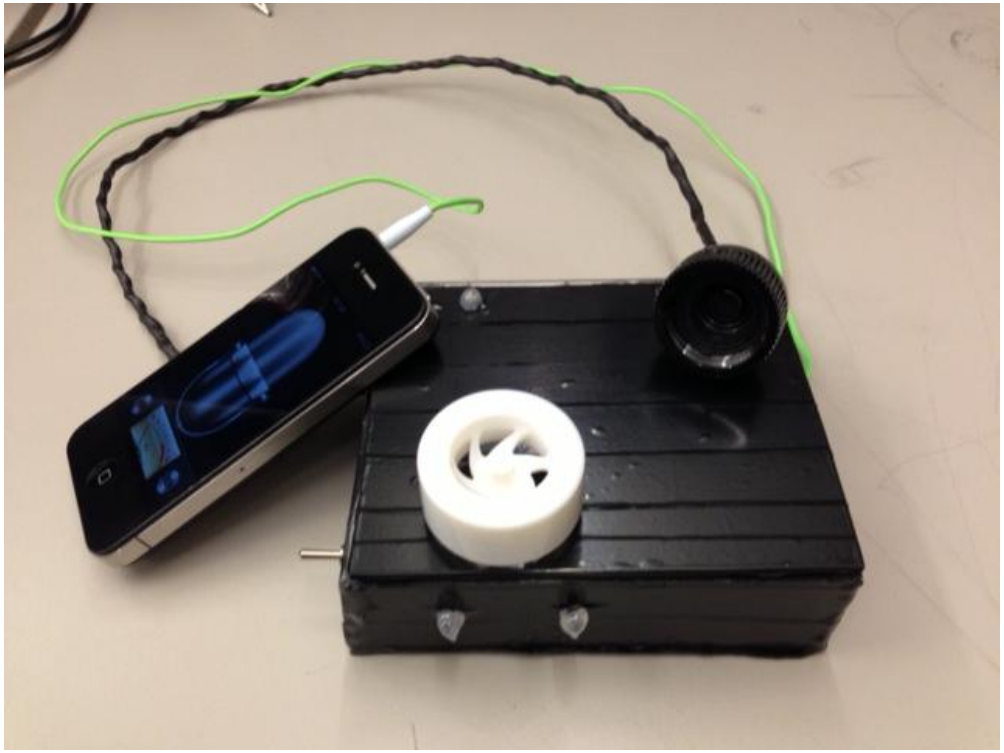
Better Life
Technology

Personal Electronics Stethoscope (PES)



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Outline

1. Introduction
2. System Overview
3. System Specifications
4. Business & Marketing
5. Time & Budget
6. Future Work
7. Conclusion
8. Question

Introduction

Company Background

- 5 People group
- Electronics or System Background

-Real Yuen (CEO)

-Guntae (Ray) Park (CFO)

-Jungjoo (Daniel) Lee (CMO)

-Seven Yao (CTO)

-Chao Yang (Jesse) (COO)

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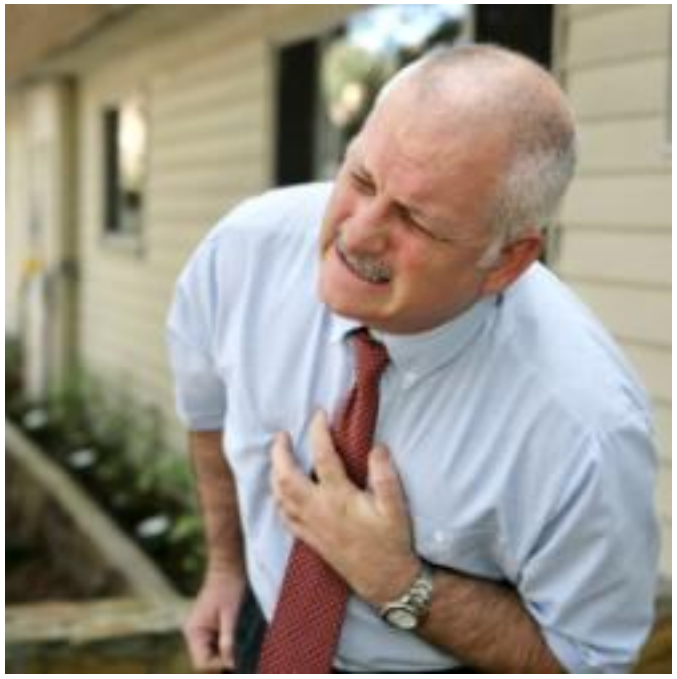
Introduction

Heart Attack/Heart Disease

- About 600,000 people die/year
- Around 46% of them from hidden heart disease



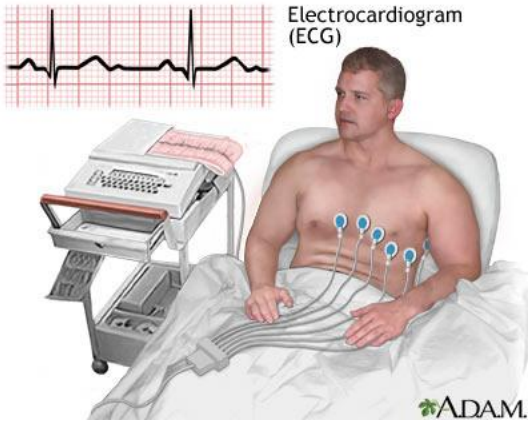
Introduction

Method on the market

- Traditional/Electronics Stethoscope
- ECG Diagram

Disadvantage

- Only for doctor
- Not portable



System Overview

Product

Personal Electronic Stethoscope (PES)

- Combination of electronics stethoscope and smart phone apps

Target Customer

- People over 22

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System Overview

Block Diagram

Pre-Amplifier

Butterworth Low Pass Filter

Power Amplifier

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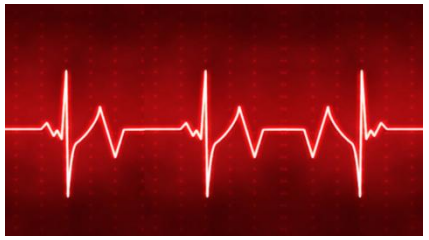
System Overview

Benefits

- Monitor the heart beat anytime



- Contact to doctor/family immediately

- Conclusively save a time and increase the possibility of saving lives

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System Specification

Hardware

- Hardware specification
  1. Pre-amplifier (TL072)
  2. Butterworth low-pass filter (TL072)
  3. Power amplifier (LM386)
  4. Voltage regulator (MAXIM680)
  5. Electret-Microphone
  6. Zener-diode
  7. Resistors and Capacitors

Better Life Technology System Specifications

Hardware modification

- Supposed to use Bluetooth
- Actually used 4-pin audio cable
- Supposed to use OrCAD
- Actually used Eagle
- Supposed to use PCB with SMD components
- Actually used prototype board with through-hole components
- Supposed to use case designed by AutoCAD
- Actually used manual-cut plastic case

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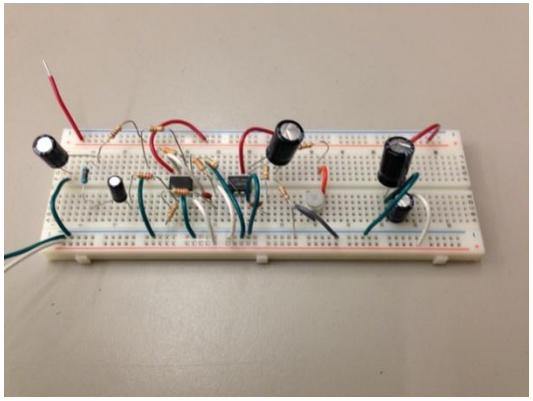
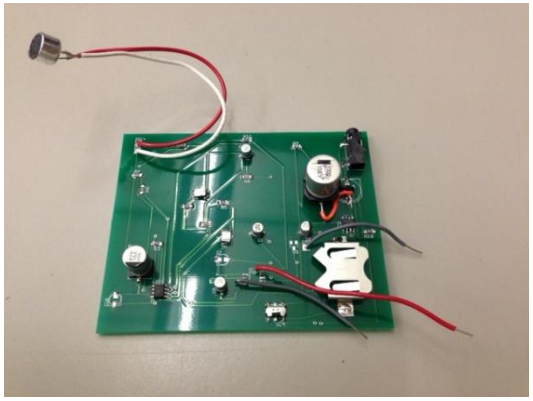
System Specifications

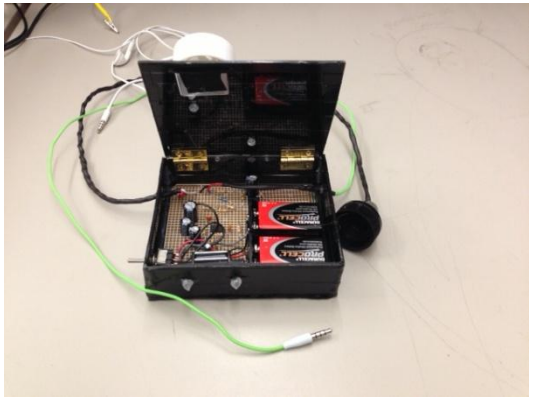
Circuit

- Electronic Stethoscope Circuit Design

  1. Prototype using Bread Board
  2. PCB
  3. Complete Circuit using prototype board with case







System Specifications

Software

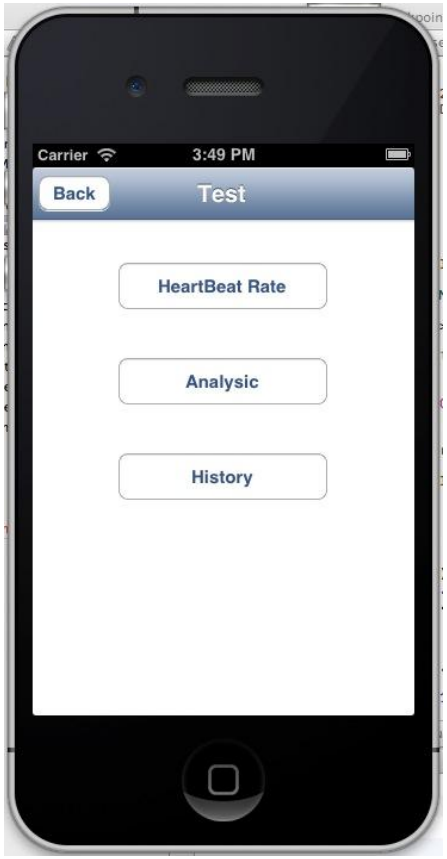
-User Interface

-Sounds Strength

-AurioTouch

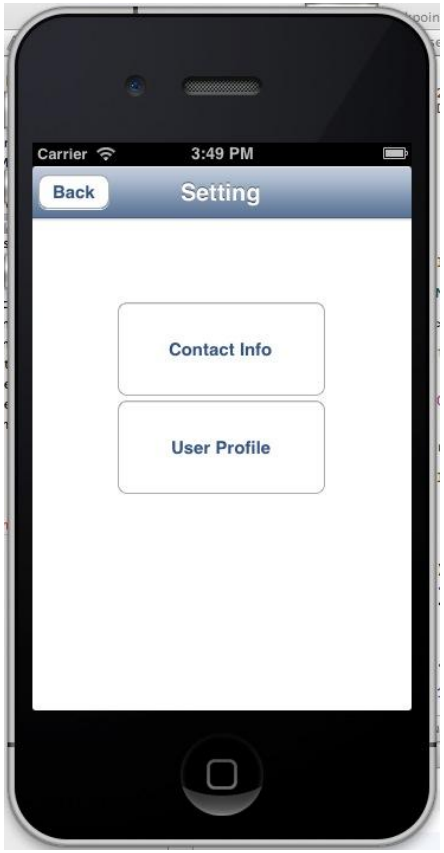
System Specifications

User Interface



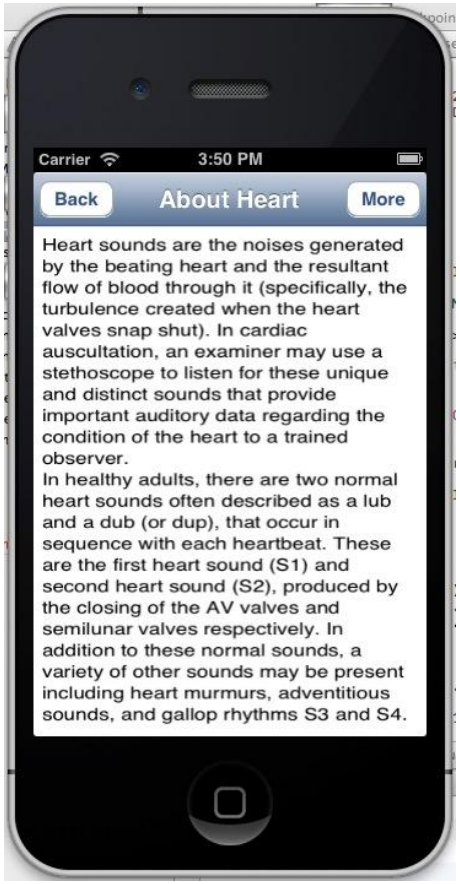
System Specifications

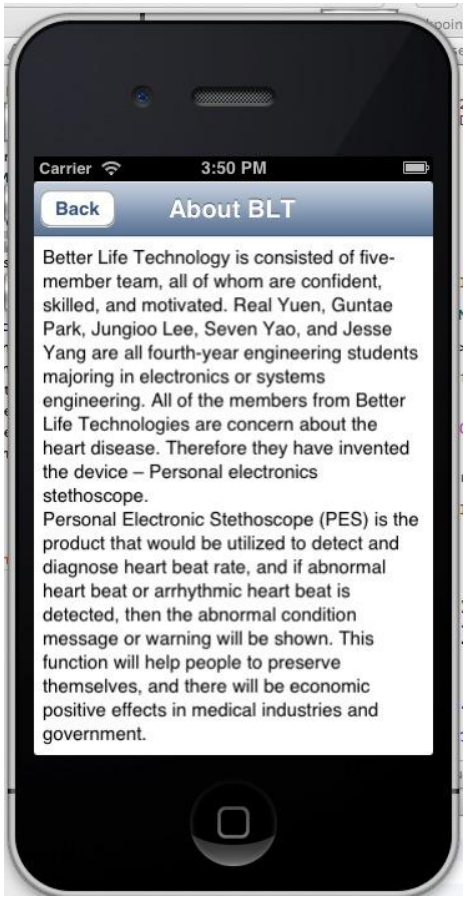
User Interface



System Specifications

User Interface





System Specifications

Sounds Strehgth

Without Input

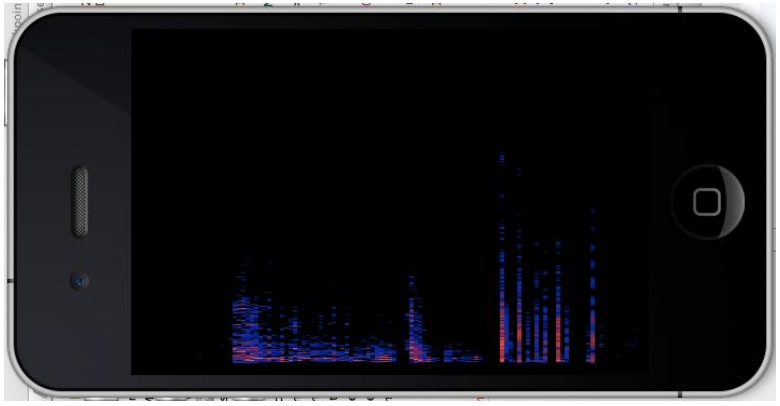
Apply Input

System Specifications

AurioTouch

General Mode

Sonogram Mode



System Specifications

Challenge for Software

- New Language/Environment
- Real Time Data Analyze

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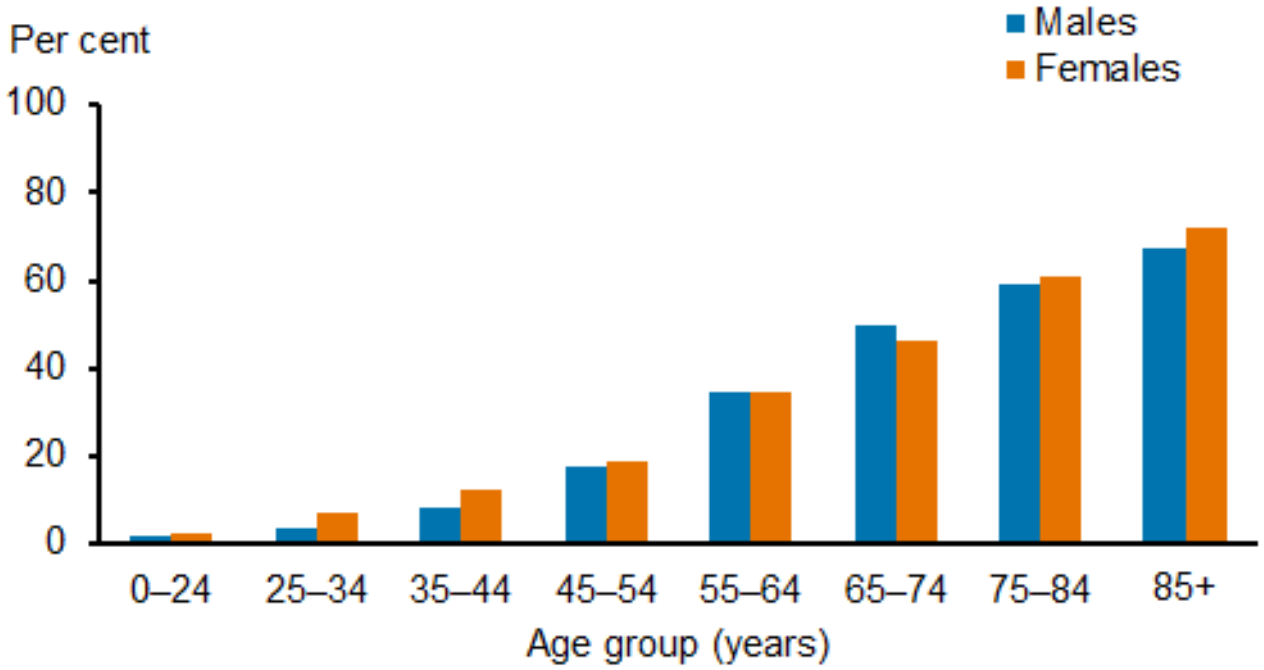
Business & Marketing

People who need our product

-Age above 22

Figure: Proportion of people with coronary heart disease by age and sex in 2007–08



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Business & Marketing

Price for our product

Categories	Competitor in Market	1 unit of PES	1000 units of PES
Components	N/A	$49.61	~$33.95
PCB	N/A	$73.92	~$25
Goal	For doctor	For patient	For patient
Total	$199~$399	$123.53	~$58.95

Business & Marketing

Comparator

- Public Hospital (Takes Time)
- Private Doctor

  - Normal Body Check

  - ECG test

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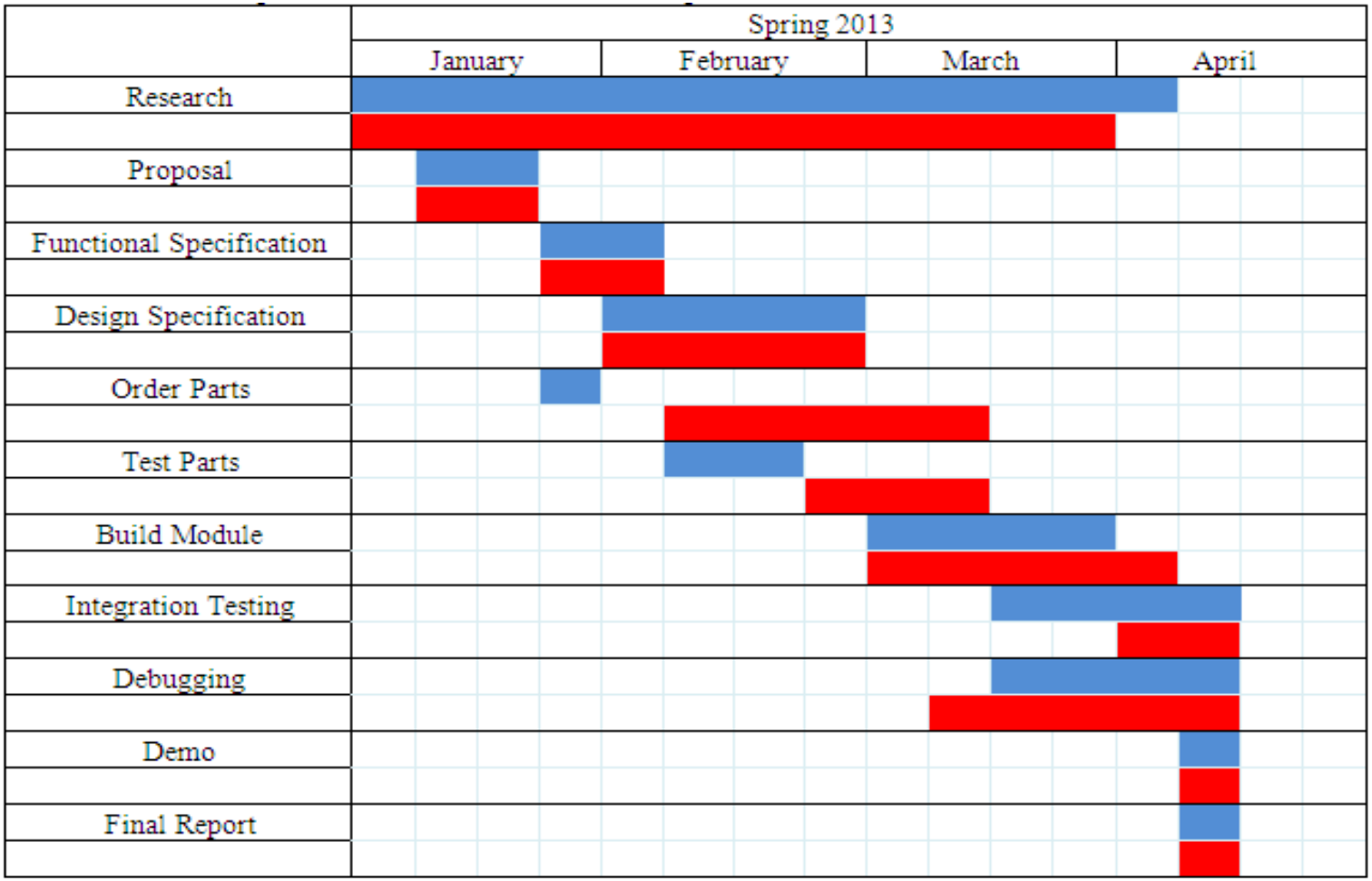
Time & Budget

Time table



Time & Budget

Budget

Equipments List	Estimated Unit Cost (CAD)	Actual Cost (CAD)
Hardware		
Stethoscope	$120	N/A
Sound Amplifier	$35	N/A
PCB Layout Cost	$100	$147.84
SMD components (Capacitors, Resistors, Op-amps, voltage regulator etc.)	$25	$103.62
Through Hole Components (Capacitors, Resistors, Op-amps etc.)	$25	$80.70
Hardware Packaging	N/A	$30.82
Software		
iOS App development Fee	$100	N/A
Network Cost	$100	N/A
Unexpected Cost		
Earphones	N/A	$13.61
Totals	455	$376.59

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Future Work

Hardware

- Need a right voltage regulator application
- Need to find low tolerance SMD components
- Need a new PCB with modified design
- Need to design hardware case using AutoCAD
- Goal to make it lighter and smaller

Future Work

- **Software**
  - Combine the existing code
  - Sound analyze algorithm
  - Filter input signal

Conclusion

- Accomplish the most we can
- We have learnt a lot
- Future work needed

Acknowledgement

- Dr. Andrew Rawicz
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- Mr. Lukas-Karim Merhi
- Mr. Ali Ostadfar
- Mr. Hsiu-Yang Tseng

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Question

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Thank You