Improve a digital stethoscope app

Proposed model

By

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1.Abstract

One of the major causes of death all over the world is heart disease or cardiac dysfunction. These diseases could be identified easily with the variations in the sound produced due to heart activity.These sophisticated auscultations need important clinical experience and concentrated listening skills. Therefore, there is an unmet need for a portable system for the early detection of cardiac illnesses. This document proposes a model of a smart digital-stethoscope system to monitor a patient's heart sounds and diagnose any abnormality in a real-time manner.

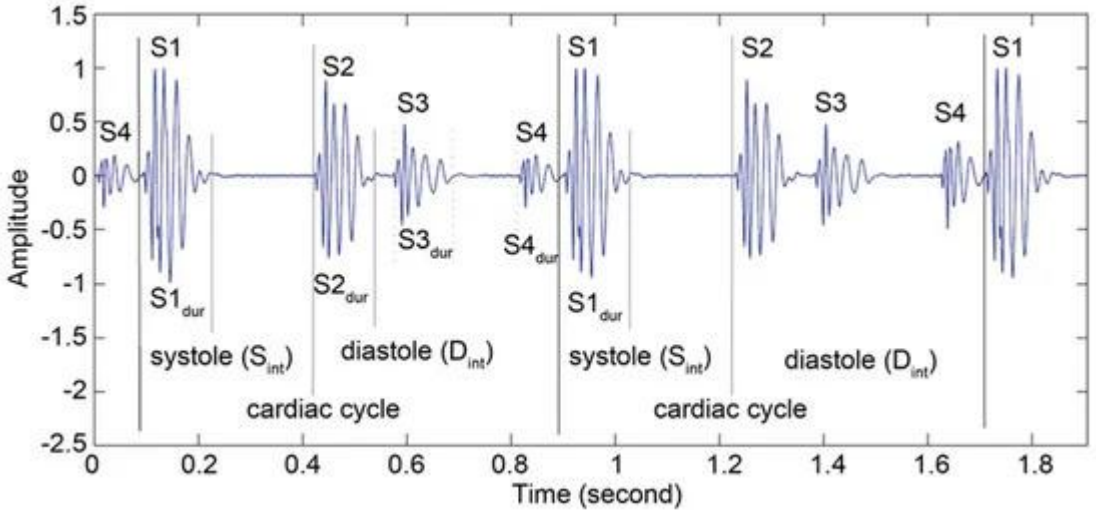
2.Proposed Solution

1. This system consists of two subsystems :A portable digital stethoscope subsystem, and an android mobile based decision-making subsystem. The portable subsystem captures the heart sounds of the patient, filters and sends the captured heart sounds to mobile phone to visualise the heart sounds and show the wellness of your heart.
2. Recorded heart sounds can also easily be sent to the doctor for consultation.

2.1 Technical Specification

- Connect a digital stethoscope with the android phone with the help of a USB cable that will measure your heart sounds.

- Below image shows the different heart sounds that can be measured through a digital stethoscope.



- We are sending this heart rate for further processing within our embedded android application which uses Tensorflow Sound Classification AI for monitoring the heart rate.
- The Android application will show the status of the patient's heart rate .This heart rate can also be recorded and can be sent to a consultant.

2.2 Application Design

https://app.visily.ai/projects/a379f396-4c7f-4fe1-8eaa-e66a560d4498/boards/407330/presenter?play-mode=All%20screens

2.3 Functionality of Android Application

_APPLICATION VIDEO

3.Timeline

Period	Task designated

Before the first internship week	Will Contact mentors, schedule meetings and define how we will communicate with each other during the internship. Fulfil all tasks asked on outreachy sites . Take care of bureaucratic requirements (signing the contract, setting up a payment method, etc).
December 5–8	Community bonding period.Requirements gathering .
December 11–February 05	Discussion with mentors about the proposed model development and how to start the enhancement of application and coding for the discussed solution,modifications as per the feedback.
February 12–13	First Stage evaluation by mentors
February 14–March 02	Will continue contribution by keeping feedback in mind and new discussion according to the requirements will start with mentors.
March 3	Final evaluation.

4.Tools and technology needed to develop the application

- Different Machine learning models to train our model.
- Java, Kotlin, Python,spring boot.
- Android Studio, Java Development Kit
- GitHub for Version control.

5.Future Enhancement

- This app is using Tensorflow Sound Classification AI for monitoring the heart rate. We can also use different models such as **bi-ResNet Deep Learning Algorithm .**
- The UI/UI of the app can be further modified to give ease to our users.

6.References

[1]https://www.hackster.io/mixpose/digital-stethoscope-ai-1e0229
[2]https://www.mdpi.com/1424-8220/19/12/2781