

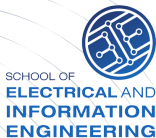
# Listen to your Heart:

## Heartbeat Sound Segmentation & Classification

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Boikanyo Radiokana & Elias Sepuru

School of Electrical & Information Engineering  
University of the Witwatersrand  
South Africa



# Agenda



Introduction

Objectives

Background

- Heartbeat Sounds Categories

- Related Work

- Project Setting

- Modifying the theme

- AAU Waves

- Widescreen Support

Feedback

- Known Problems

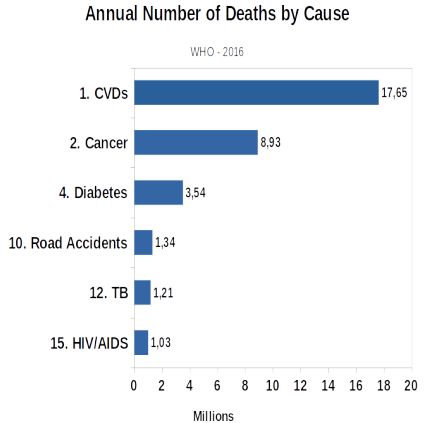
- Bugs, Comments and Suggestions

- Contact Information

# Introduction



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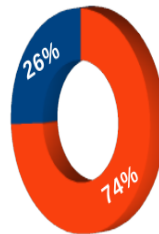
Correct diagnosis using CA in USA, Canada & UK respectively.



## Awareness of Heart Condition

America - 2016

- ▶ CVDs are the leading causes of death globally - WHO.
- ▶ Currently used method to check for CVDs is Cardiac Auscultation (CA).
- ▶ CA is a difficult skill to acquire.
- ▶ People are not aware of their heart conditions.



- Know Their Heart Condition
- Don't Know Their Heart Condition

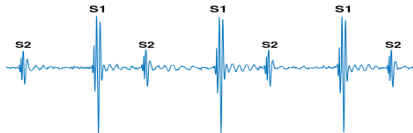


Easily accessible & reliable heart diagnosis systems would help reduce deaths due to CVDs.

# Objectives



- To segment Heartbeat sounds (HSs) based on the location of S1 (lub) S2 (dub) in Normal HSs.

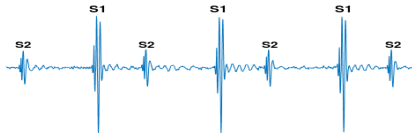




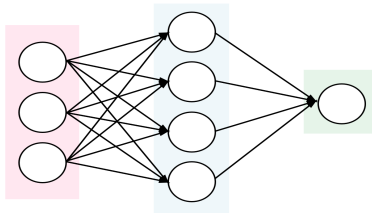
# Objectives



- To segment Heartbeat sounds (HSs) based on the location of S1 (lub) S2 (dub) in Normal HSs.



- Create models that will enable preliminary screening of CVDs





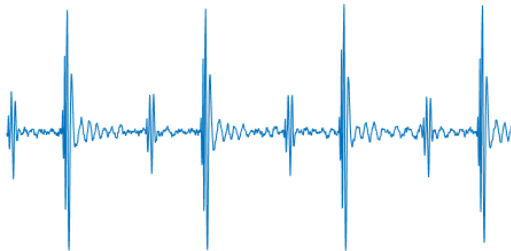
This project deals with classifying HSs into the following categories:

1. Normal HSs
2. Murmur HSs
3. Extra Heartsounds
4. Extrasystole HSs
5. Artifact



## Normal HSs

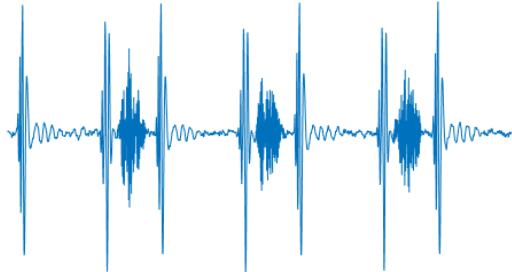
lub...dub.....lub...dub.....





## Murmur HSs

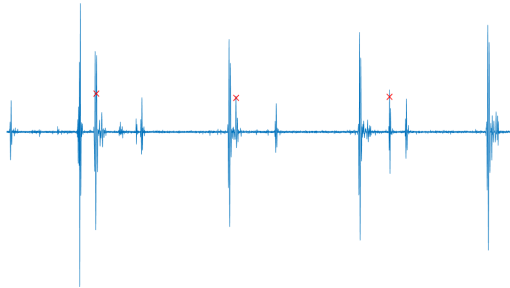
lub...\*\*\*..dub.....lub...\*\*\*..dub.....  
or  
lub....dub...\*\*\*...lub....dub...\*\*\*...





## Extra HS

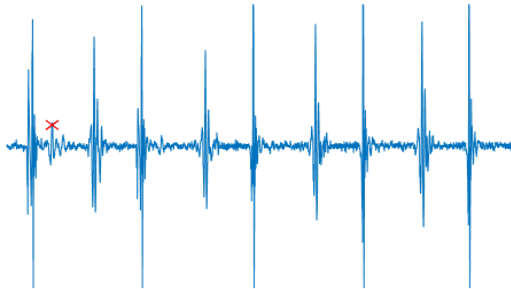
lub.lub...dub.....lub.lub...dub.....  
or  
lub...dub.dub.....lub...dub.dub.....





## Extrasystole HSs

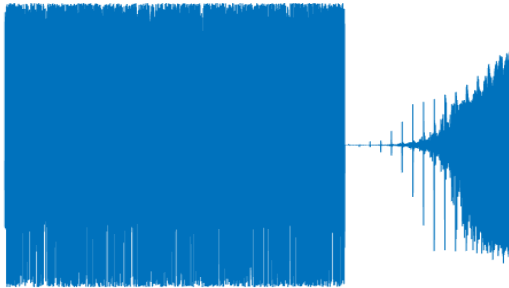
lub...dub.....lub.lub...dub.....lub....  
or  
lub...dub.dub.....lub...dub.....lub....





## Artifact Sound

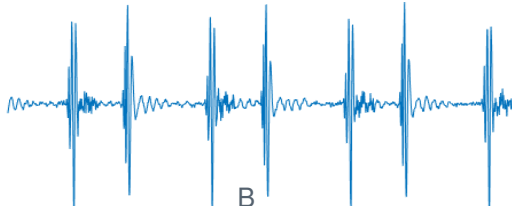
Not an actual HSs.



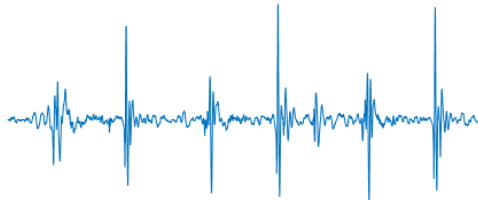


Can you guess the categories?

A



B







Strunic's attempt to classify HSs with ANN.

**85±7.4%**

Accuracy when classifying simulated HSs with no noise.

**48±12.7%**

Accuracy when classifying real life HSs with noise.



To make this project applicable to real world situations, two datasets recorded in real life settings will be used. Both datasets contain excessive background noise.