Creating A Simple Electronic Stethoscope to Monitor Heart Related Problems Using Machine Learning

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1 Abstract

2 Key Words

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3 Introduction

4 Background and Motivation

In this section, we first provide background knowledge on the importance of monitoring heart related problems and one of the most common standard methods used in heart disease evaluation via the usage of a stethoscope. We then introduce our new approach on a stethoscope design and its limitations of directly capturing a range of datasets.

5 Importance of Monitoring Heart Related Problems

Monitoring heart disease problems is essential for early detection, effective management and prevention of serious complications. According to the American Heart Association, regular monitoring assists in identifying risk factors such as: 'diet quality, physical activity, smoking, body mass index, blood pressure, total cholesterol, blood glucose and sleep quality' [X]. In other words, regular monitoring not only allows the doctors to treat the patients' health but also make the necessary adjustments to optimize the treatment plan by considering several risk factors and improve long-term results. Ultimately, monitoring of heart health can be viewed as a proactive method in lowering heart problems while also serving as an essential method to continuously better prognose patients who already have existing heart related problems.

6   Traditional Stethoscopes

One of the main instruments in diagnosing and monitoring heart related problems is a stethoscope as seen in figure 2. This medical tool is composed of three parts: a chestpiece, tubing and a set of earpieces. It then functions by amplifying internal sounds from the body through two important elements: vibrations and sound waves [2]. It works when the chestpiece/diaphragm is placed on the patient's chest, where the heartbeat creates soundwaves that makes the chestpiece to vibrate. Where afterwards these vibrations make its way through the tubing and into the earpieces. At this point the doctor can begin to interpret the heartbeat and sounds. As shown in figure 3, there are four common breathing sounds when using a stethoscope which all can be interpreted when diagnosing heart related problems.

References

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