Name(s)	Project Number
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Project Title

Digital Stethoscope to Assist Detection of Irregular Heartbeats

Abstract

Objectives/Goals

According to The Heart Foundation, the number one cause of death in the United States is Heart Disease. Doctors around the world use stethoscopes for the diagnosis of various heart conditions. Unfortunately, according to a recent Washington Post article, "both internal medicine and family practice trainees had a disturbingly low identification rate for 12 important and commonly encountered cardiac events." The goal of my project is to create a digital stethoscope to help detect irregular heartbeats. Future models could include artificial neural networks to differentiate between specific conditions.

Methods/Materials

I used a Sparkfun Fio v3 (Arduino based) microcontroller with an electret microphone connected to a standard stethoscope, all housed inside of a project enclosure and linked via USB to a PC running code for processing data. Test models relied on an Arduino Uno and a breadboard microphone amplifier circuit.

Results

The stethoscope linked to the microcontroller successfully captures and displays heartbeat data, including the possibility of an irregular heartbeat. Incoming data is converted into 1's and 0's, which is compared to an ideal sample that is created dynamically.

Conclusions/Discussion

I accomplished what I set out to do in my objective. I have created a digital stethoscope that can help to detect irregular heartbeats. My project provides information that can help doctors to detect a possible irregular heartbeat.

Summary Statement

My digital stethoscope can effectively detect potential irregular heartbeats, and could assist in diagnosis.

Help Received