

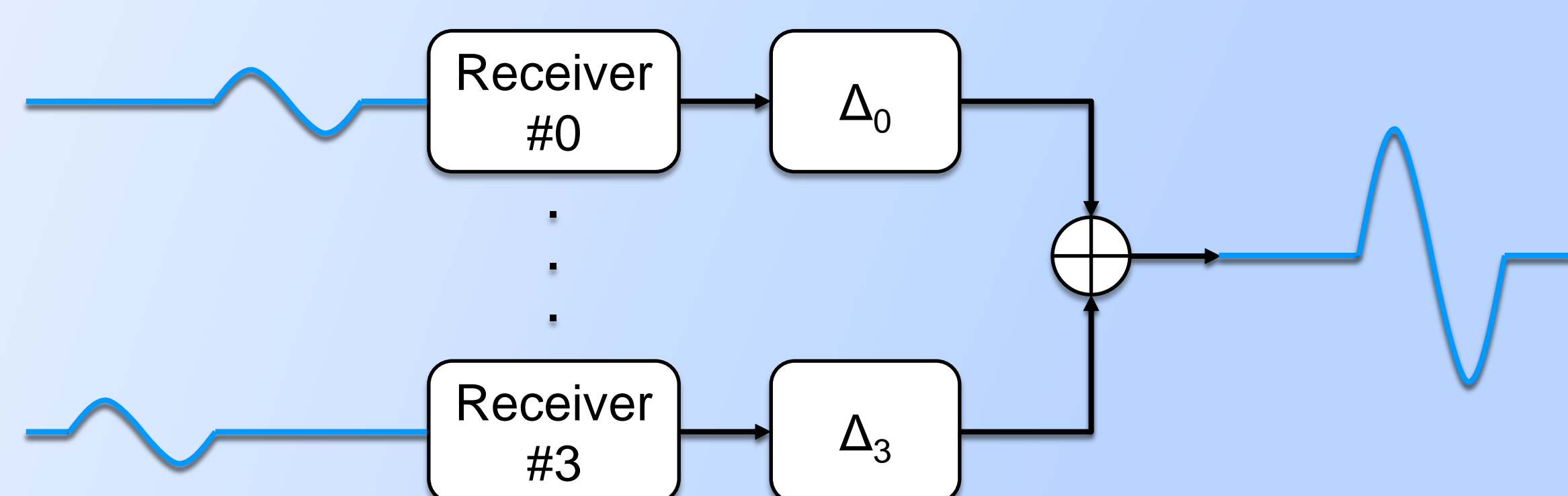
Background

RAYO is an electronic stethoscope that resolves three significant drawbacks of its mechanical alternative:

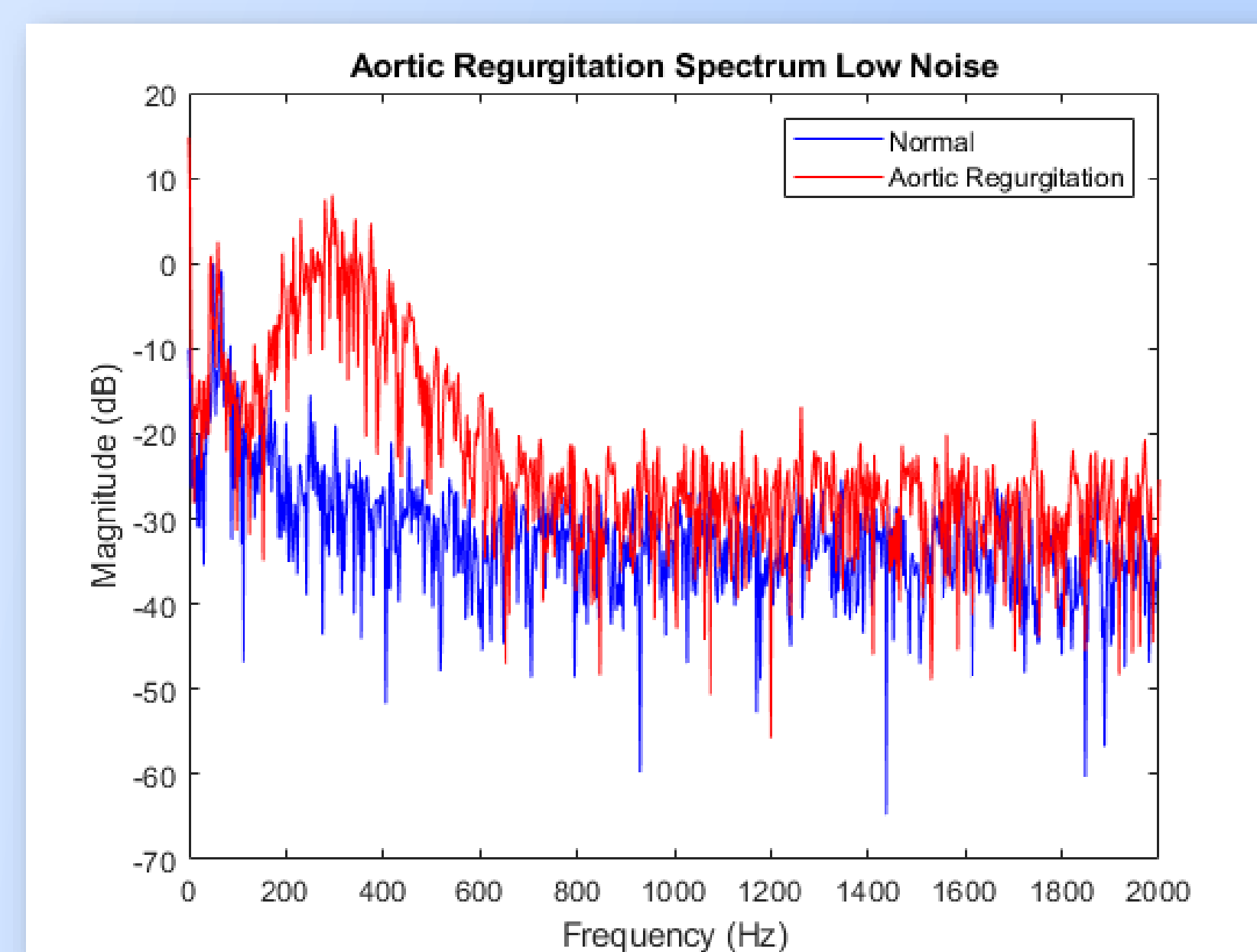
- Inaccurate Sound Perception
- Uncontrollable Sound Amplification
- Lack of Acoustic Data Collection Capabilities

Processing Algorithms

RAYO uses advanced signals processing techniques such as Beamforming and the Short-Time Fourier Transform (STFT) to accurately detect heart conditions and their spectral features.



Delay-and-Sum Beamforming Algorithm

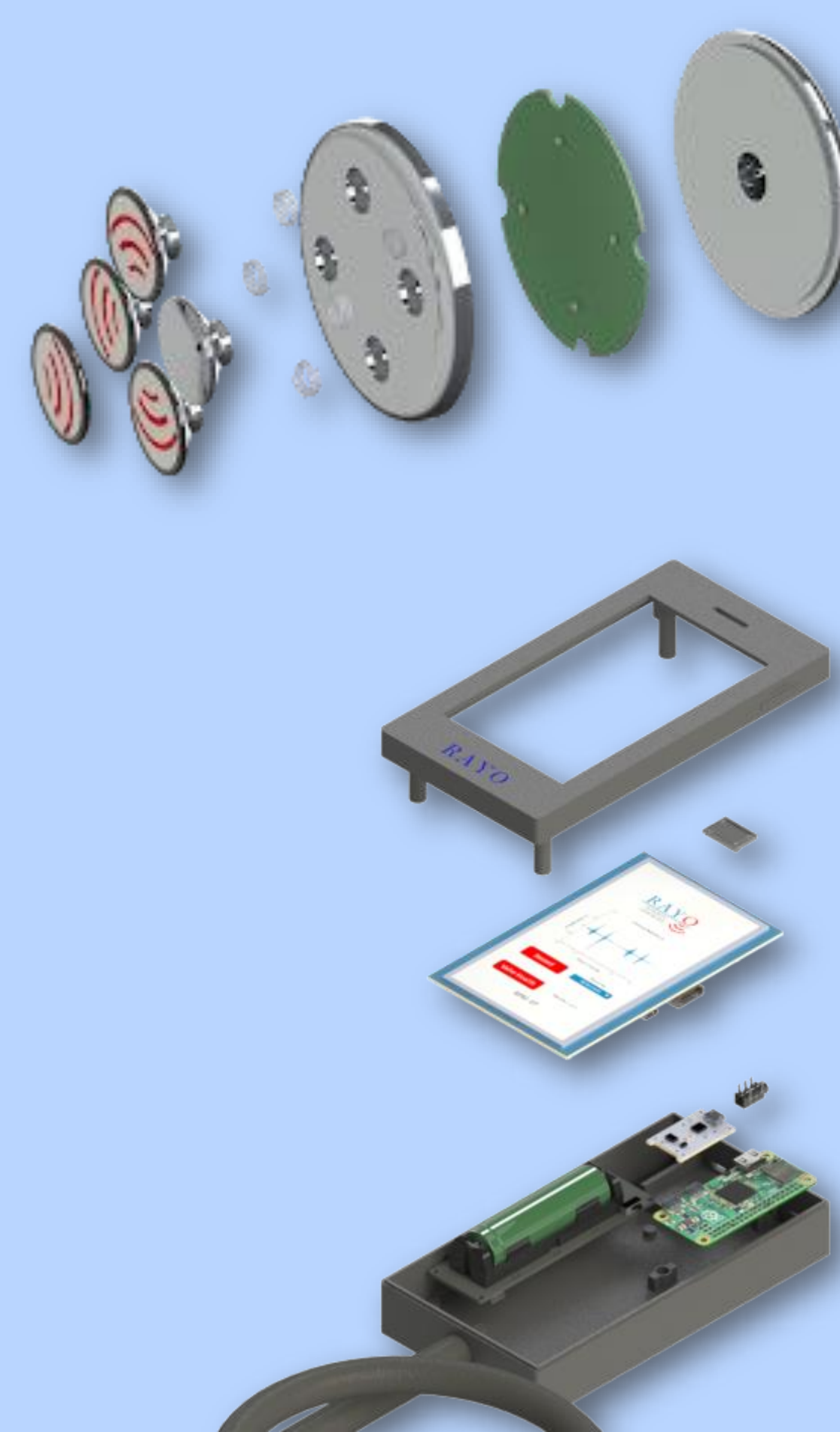


Spectral Analysis Distinguishing Between a Normal Heart and one with Aortic Regurgitation

RAYO



Key Components



- 5" Touch Screen
- Raspberry Pi Zero
- MEMs Microphone Array with Contour Mechanism
- Texas Instruments ADS1278
- MicroSD Card Storage
- Flexible PVC Cable

Graphical User Interface

Doctors can record heart data and check for heart valve defects using our GUI.



Future Improvements

Should an opportunity arise, we would like to assemble a physical build of our device and expand our heart issues detection algorithm to work with other heart conditions.

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