Innovating Cost-Effective Cardiological Sound Transducers for Enhanced Applications

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The project aims to advance both technological designs and medical applications, ultimately leading to the creation of a cost-effective and efficient makeshift stethoscope for widespread use. We developed a fully functioning digital stethoscope from scratch using Arduino UNO R4 and MAX4466 sound transducer. We then applied software filtering and digital signal processing for further noise reduction. Lastly, we created and tested various stethoscope bottle designs for optimal housing and acoustic performance. Bottle models with a cut-out neck provide significantly clearer resonance compared to the full-sized double-sided bottle, regardless of the internal material. When aluminum foil is introduced, it causes too much interference, which complicates the differentiation of actual heartbeats from minor movements and shuffling. This project showcases how low-cost, simple components can be combined to create a functional medical device suitable for resource-limited settings.

Awards Won: