

# DESIGN OF CHESTPIECE MEMBRANE CONTROL FOR SUPPORTING REPRESENTATION IMPROVEMENT OF PHONOCARDIOGRAM CONDITIONS ON ELECTRONIC STETHOSCOPES

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## ABSTRACT

The purpose of this study was (1) to make a prototype representative electronic stethoscope related to the flexibility of the membrane (chest membrane), and (2) to analyze the composition and content of the frequency components contained in the phonocardiogram signal with spectral extraction ..

This research utilizes a prototype of a human heart rate detection device based on an existing electro-acoustic (electronic stethoscope) principle to record an artificial heartbeat. The use of an artificial heartbeat to ensure consistency in composition and frequency of signal source frequencies. The output of this device is a voltage signal that represents the heart rate. The chestpiece part of the prototype was varied in membrane flexibility. The signal is then recorded with a laptop using the Sound Forge 10 application program in the form of a wav file. This signal is then analyzed for the composition and content of the frequency components using a spectral extraction. This principle is chosen considering the heart rate includes pulses that contain many components (spectrum).

An electronic prototype stethoscope has been made related to the flexibility of the chestpiece membrane. It turns out that the flexibility of the chestpiece membrane stethoscope on the market has been designed so that it is only able to respond to frequencies in a relatively limited range (less than 2000 Hz). PCG (phonocardiogram) signaling analysis results with spectral extraction showed that the flexibility of the chestpiece membrane affects the composition and content of the frequency components contained in it.

Kata Kunci: *Membrane Flexible, Chestpiece, Honocardiogram Alert, Electronic Stethoscope*