Using Smart Phones to Capture and Analyze Heart Data: HeartEra App

Helmy, Amir

Heart disease is the leading killer of men and women in the U.S. today. According to the CDC About 600,000 people die of heart disease in the United States every year–that's 1 in every 4 deaths. Every year about 715,000 Americans have a heart attack. About 5.1 million people in the United States have heart failure. About half of people who develop heart failure die within 5 years of diagnosis. Heart and breathing rates have been linked to symptoms of other disorders, prediction of the onset of emergencies and to wellness in general. Using available technology to gather information about the heart and breathing conditions automatically and continuously poses multiple challenges; to achieve optimal detection (minimizing error) while meeting the design goals of energy efficiency, reach, robustness, and affordability. This investigation aims to address these issues via novel algorithmic design, HeartEra, using advanced sensor signal processing, iterative refinement and field-data-intensive analysis. The algorithms utilize time series filtration (Butterworth Filter) and frequency (FourierTransform) analyses to process tri-axial accelerometer data from a new perspective. This multi-dimensional approach allows for a new look at comprehensive heart data which can lead to improved treatment and monitoring of the heart and breathing, with potential for early detection or prediction of disorders and health problems.

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