Abstract

Sleep apnoea is the most common form of different types of sleep-related breathing disorders. It is characterized by repetitive stoppage of respiratory flow during sleep. This paper discusses an approach towards identifying the presence of sleep apnoea based on the acoustic signal of respiration. Different techniques for apnoea detection are discussed in this paper. The characterization of breathing sound can be carried by Voice Activity Detection (VAD) algorithm, which is used to measure the energy of the acoustic respiratory signal during breath and
breathe hold. VAD is useful as a predictive tool for the segmentation of breath into speech and silence or non-sound segments. VAD based on zero crossing rate and short energy serves as a simple and fast method approach to divide the signal into voiced and unvoiced classes. Other methods using Capnostat and using strain gauge sensor are discussed. In both methods of Capnostat, we are measuring CO2 in the breath by counting how many times CO2 increases in the breath. Thus, we can determine respiration rate. In the first method, breath by breath samples are taken. Continuous monitoring of CO2 is not possible in the first method, it is only possible in the second method.

References

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Keywords

Apnoea  Apnoea Detection Methods  Voice Activity Detection Algorithm (vad)
Respiration Monitoring

Zero Crossing Rate

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Capnostat

Strain Gauge Sensing