A Novel Algorithm to Obtain Respiratory Rate from the PPG Signal

Abstract

Respiratory rate is a vital parameter which gives an indication of abnormal respiratory conditions. There are various methods which can be utilized to obtain breathing rate but they have certain drawbacks. In addition to SpO2 and heart rate measurement, PPG signal obtained from pulse oximeter can be used to get respiratory information which avoids use of additional sensor. In this paper, Ensemble Empirical Mode Decomposition algorithm has been proposed, which efficiently extracts respiratory information from PPG signal obtained by photo-plethysmography and decomposes a signal into IMF’s while retaining features of the signal. This PPG signal has respiratory information embedded in it. It is observed that, this method helps in overcoming the drawbacks of traditional EMD method and giving 97% average accuracy.

References

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Index Terms

Computer Science  Algorithms
Keywords

Respiratory rate; Photo-plethysmography; Beer-Lambert’s law; PPG signal; EMD; EEMD