The Office of Technology Management

UNIVERSITY OF TEXAS ARLINGTON

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Diagnosis of sleep-disordered breathing using ECG

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TECHNOLOGY NEED

About 90 million Americans suffer from sleep-disordered breathing (SDB). SDB is characterized by abnormal breathing patterns during sleep. A very common symptom of SDB is snoring. Cardiovascular disorders are potentially mediated by sleep apnea. Screening and monitoring for sleep apnea becomes imperative. However, polysomnography does not have good correlation with subjective instruments and it is also a time consuming and expensive sleep study. Hence, hospitalized and critically ill patients are unable to perform breathing studies. Current methods for long-term prognosis of sleeping apnea require patients' intensive cooperation and are also expensive. A simple, affordable and also long-term feasible disordered breathing system is in demand.

INVENTION DESCRIPTION/SOLUTION

The technology focuses on diagnosis of SDB by detecting the SDB events utilizing electrocardiographic (ECG) measurements. SDB is characterized by recurrent episodes of apnea and hypopnea during sleep. In this method of SDB detection, a signal sampler samples the cardiac electric signal to form the ECG signal. These ECG signals are stored and then analyzed by a software which analyses the amplitude characteristics of R wave peaks. It also analyses the characteristics of QRS complex pulses which are contained in the ECG. The power spectral density for R wave peak time series and QRS complex pulse area value time series is compared with the threshold level values to detect sleep – disordered breathing.
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APPLICATIONS

- Diagnosis and detection of sleep – disordered breathing conditions such as apnea and hypopnea.

KEY BENEFITS

- Highly Accurate
- Non – invasive and less bulky
- Comfortable to use
- Low-cost system for short & long term diagnosis
- Relatively simple procedure.

STAGE OF DEVELOPMENT

Prototype

INTELLECTUAL PROPERTY STATUS

Patent Granted – US7343198B2

RELATED PATENTS

US7801593B2
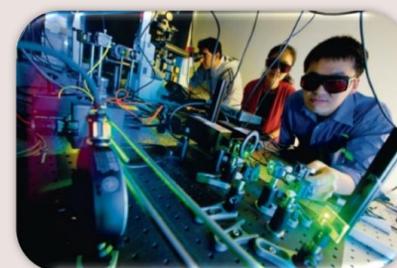
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