Treatment of Sleep Apnea using CPAP

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Abstract: Worldwide, they are more than one in ten children are born prematurely. Eleven countries, have higher preterm birth rates Premature maturation (born before 37 weeks of pregnancy) is strongly associated with difficulty breathing diseases, that is, the leading cause of death for children under five. Because their lungs well developed, enemies in particular exposure to respiratory problems. One such the leading cause of child mortality worldwide Respiratory Distress Syndrome (RDS). Currently technology (recommended by WHO) by CPAP (Continuous Positive Airway Pressure), i.e., helps keep the alveoli open by giving continuous distribution of air / oxygen. This ensures that the children stay healthy residual air in the lungs, so it does not strive to breathe and are continually saved problems such as hypoxia and even death CPAP standalone devices cost more than INR 150,000 ($ 2300) more expensive many developing hospitals. For the most part hospitals in restricted services, Oxygen treatment in the nose is often the solution available, on the basis of respiratory depression.

Keywords: Respiratory Distress Syndrome (RDS), nasal oxygen therapy, Premies.

I. INTRODUCTION

Sleep apnea is important sleep disturbances where regular breathing disconnected and started. When you smell it up and feel it tired even after a full night's sleep, you might have sleep apnea. Signs and symbols of the central closing apneas sleeping apneas above include: Large snoring, shortness of breath during sleep, waking up with a dry mouth, Episodes where you stand breathing during sleep — which could not be reported by someone else.

This happens when our muscles it is relaxed, your airway is narrowing or closing like you breathe. There was no longer enough air, i.e., it lowers our oxygen levels in our blood. Yours the brain feels incapable of breathing and briefly wake you up by being able to reopen the file way of the spirit.

There will be sneezing, shortness of breath and choking. This the pattern will be repeated five to 30 times which is destroys your ability to hold deep, that is make a comfortable sleeping section. Improved, CPAP is duplicate, cheap, and easy to use, i.e., it is used to keep the remaining air constant pressure on the lungs of infants and toddlers (to prevent alveoli collapse) at the same time is transferred to a higher institution of advanced care or in any other clinical setting.

II. LITERATURE SURVEY

[1] In this paper, an algorithm for depth learning is used for different dynamic tests including the throat muscles, which are often disruptive at bedtime. It gives an image of Apnea an in-depth learning paradigm that goes hand in hand with power cancer dysfunction. Depth technology reading primarily modified integration convolution neural network is used as a function detector. At the end of MCFNN, the connected layer adheres perfectly to the output layer and add the required number of the effects of sleep apnea occur over time ECG data analysis.

[2] This paper starts the default method based on acoustic signal breathing in relation to the presence of sleep deprivation. Through voice function detection algorithm based on word processing breathing noise. The algorithm is actually tested respiratory symptoms and results show that VAD is used for air separation noise and silence test components.
[3] This paper initiates a mode that is capable of can be done with hardware partition OSA patients based on EEG signal. The strengths and variations of descriptive features exist removed from each bench used as an insert segmentation parameter. Algorithms for SVM, AWN, LDA and NB have been recognized for this OSA identification whether or not. The results obtained from classifiers are compared to accuracy, sensitivity as well details.

[4] In this study, the SA acquisition model is stand in the usual stock of a little automatic encoder (FSSAE) and time-dependent costs a critical separation model (TDCS) was started. FSSAE removes a set of defaults through an uncontrolled learning process automatically and the TDCS model is proposed by includes Hidden Markov Model (HMM) and a melanoma algorithm to improve differentiation performance. As a result, segregation achieved 85.1%, 86.2% and 84.4% accuracy, grace and clarity.

[5] In this study, the motif process was used to find long-term patterns in parameters found in the combination of nerves & smart phones. This activity increased utilization the process of understanding distance, through this, it reduces the need for professional intervention.

[6] This paper is about multiple uses classifiers and acoustic based features on the diagnostic function of OSA provides results of snore audio research. This has consequences research allows researchers to associate frequency sub bands are important in finding OSA.

[7] This paper shows the method of based breathing tests neural network that allows identification of respiratory patterns and discomfort suggested for that it happens. This page describes the results for exploring and teaching different forms of energy and recurring networks: NARX, Elman, distributed and focused on time delays.

[8] Continuous positive pressure of air CPAP treatment is an effective treatment for patients who decide on unrestricted sleep apnea (OSA). However, there were only a few data details for long-term integration. The goal of this study to calculate the range of non-adhere to and explain the clinic features.

[9] This study aims to establish continuous air pressure collision (CPAP) and / or reconstruction of the basal ganglia beating patients with OSA. The case was scheduled for 2015–2018. Topics get practice rehabilitation training for up to 2 years and assigned to mediation and controlled groups treated with CPAP or except in sequence. After that, treatment results on sleep parameters, car work, stroke, normal daily activities, the work that followed, and the conditions of intelligence were present check at different times.

[10] Obstructive sleep apnea (OSA) is a general disturbance, and continuous airflow Constructive pressure (CPAP) has been tested for accuracy high quality treatment. CPAP is known as you have a problem with attachments, and many patients eventually ignore this device.

[11] Continuous positive air pressure (CPAP) has generally seen treatment for OSA election, but non-compliance rates up. In this study, 29 women were enrolled from primary care offices. Finished file for test battery and make overnight nocturnal Polysomnography (PSG) compliant by visiting a sleep specialist. In addition, can predict 87% of supporters and 93% of women who do not adhere. One key one Predictability was a nightmare. We talk about getting a reference to know women in primary care with possibly OSA and give credence to strengthen treatment retention.

[12] Continuous use of default airway pressure treatment (auto-CPAP) has been regular suggested qualification-to-critical studies obstructive sleep apnea (OSA) without importance comorbidities. This study aims to test the process of the beauty and adherence of CPAP automation treatment to studies with OSA.

III. OBJECTIVES OF THE PROPOSED SYSTEM

There were various problems while using CPAP and its remained untreated. Our objective is to find out a solution for the inconvenience and make this as a low cost portable one. Thus we are going to collect real time data with the help of our designed one. The obtained data then transferred via IOT.

IV. PROPOSED SYSTEM

In our proposed work we are going to design a compact CPAP (Continuous Positive Airway Pressure) kit based on IOT environment. This kit will detect the snoring rate of a patient who has been suffering from breath abnormalities. Because of its low price this will help people to reach in a best way. We implement this kit at a price which is 1/3 of the actual one. Portable in size and easily rechargeable. Controlled pressure airflow system (CPAFS) is used to protect and maintain the air level. There are two modes of operation one is the auto mode and another one is timer mode or manual mode; smart mode offers decent life for the Machine. We also add temperature sensor and heart rate sensors in that. Temperature sensor which continuously detect the temperature of the patient. Also the heart sensor which monitors the beating rate of heart.
Methodology

The concept of Continuous Positive Airway Pressure is to avoid the air blockage in the throat and nose by using the CPAP device. When the sleep apnea occurs, it will be detected and gives the normal air pressure to the patient. Then it will transmit the data of the patient to the specific doctor or the family members through IOT.

Fig 1: Comparison of normal breathing vs OSA

Based on the values received from the Sound sensor the CPAP System will automatically Provide the Airflow through the Breathing mask.

Method:  
Planning CPAP for investigation a device with musical instruments for a long time as data in a micro-controlled system, electro- air circuits and signal condition sensor boards optimized for availability the advantage of CPAP with low power use.

Fig 2: Block Diagram of Proposed System

| S.NO | Component      | Quantity |
|------|----------------|----------|
| 1    | Atmega328      | 1        |
| 2    | Potentiometer  | 1        |
| 3    | Sound sensor   | 1        |
| 4    | Airflow tube   | 1        |
| 5    | Air filter     |          |
6. Air blowing controlled motor
7. Motor Controlling unit
8. Keypad
9. Liquid Crystal Display
10. Bluetooth

| Table 1: Hardware and Software |
|--------------------------------|
| Start                        |
|                              |
| Initializing Sensors         |
|                              |
| Get the Readings from sensors|
|                              |
| IF FALSE                     |
| Compare the input data with the Threshold value |
| Display the sensor           |
| Stopping the signal          |
| Stop                         |

**V. RESULTS AND DISCUSSION**

This paper has introduced a platform that will allow you to approve real-time monitoring of patients with sleep apnea inside a mobile device. The diagnosis of apnea is not very common in India. Initially, CPAP patients should be tested in a sleep lab where the optimal pressure is usually determined by technologist manually titrating settings on reduce apnea. A lung doctor can help get the most comfortable mask, temptation a humidifier room in the machine, or use a a separate CPAP machine that allows multiple or default pressure settings. Auto forward CPAP machines use computer algorithms as well pressure transducer sensors to determine good pressure to end apneic events. But our suggested solution is a wearable device, e.g., Mask. The sensor will see Sleep Apnea, which will be used for segregation. Man must apply CPAP mask, convert pressure to cleanse the air and sleep. This process is slowing down chances of apnea occur. Like result, improved "Sleep Breathing Detector device, where the soul episode when it happens, the oxygen level in the blood decreases, too the heartbeat slows down. As a result, the heart rate decreased. In time at that point, normal air pressure will be supplied patient using an air flow tube. It pulls out blockage in the throat or nasal
passages, i.e., the active principle behind our product. The advantage of this platform is its ability to post to
Physician for wireless communication further analysis. It will also be connected to family members when
apnea is diagnosed.

VI. CONCLUSION

Sleep Disorders (OSA) episode detection and monitoring are important in society through development in the
lives of many people and reducing the cost of death and health care. This paper suggested a route, installed a
real-time mobile monitoring a program, to monitor patients with OSA. Airway crashes can occur from a
variety of sources causes, and CPAP is used to maintain airflow plural in some of these situations. Easy, the
best and most effective way to get apnea with using a CPAP device. Writing activities of the heart. It’s a less
expensive option, too and a free suffering process. Another advantage that it does not attack and can be viewed
on at a home where the patient is very comfortable.

VII. FUTURE WORK

Our future job is to make the implementation of real-time health care. We are planning to access our file on
customers through various channels such as Medical Stores. New-borns and infants they are at greater risk of
developing apnea. Using our product can reduce the number of deaths that should be followed breathing in
children.

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