REVIEW PAPER ON BABY INCUBATOR

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ABSTRACT

Infants who born before 37 weeks of the gestation period are known as preterm or premature babies. Preterm baby requires surrounding exactly similar as in the womb to cope with the external environment. In fact mammals have the advantage of being homoeothermic, i.e. they have a nearly uniform body temperature, regulated independent of the environmental temperature. Babies born prematurely may need additional time to develop their lungs and other vital organs. (Their eyes and ear drums may be so sensitive that normal light and sound would cause permanent damage to these organs.) Also, babies born extremely early will not have had the time to develop fat just under the skin and will need help to keep themselves warm and toasty. Sometimes babies will have fluid or meconium in their lungs. This can lead to infections and an inability to breathe well. New-born may also have immature, not fully developed lungs that require monitoring and extra oxygen. An infant has a relatively large surface area, poor thermal insulation, and a small amount of mass to act as a heat sink. The new born has little ability to conserve heat by changing posture and no ability to adjust their own clothing in a response to thermal stress. To provide the similar environment as in the womb infants have to be kept in a device known as incubator. An infant incubator is a device consisting of a rigid box-like enclosure in which an infant may be kept in a controlled environment for medical care. An infant incubator provides stable levels of temperature, relative humidity and oxygen concentration The relative humidity should follow set values according to the number of incubation days. incubators can reduce the chance of germs and additional infection while a little one heals from an illness. Incubators also offer a protected space where it's possible to monitor vitals 24/7 when your baby also needs multiple IVs for medication, fluids, etc

INTRODUCTION

Our project is a smart infant bodysuit that consists of fabric based resistive filaments that safely provide warmth to the neonate as due to preterm birth body is fat is miniscule . Comfortable textile-based electrodes monitor ECG, Respiration Rate. Pulse Oximetry would be integrated with the baby's hoodie and would measure the oxygen saturation in blood in theearlobe .Hypoxemia and apnea can be detected early using Respiration and Blood Oxygenation data to trigger alerts. The wearable would also provide peace of mind to a parent who in many preterm cases are extremely stressed.

In rural areas there is no such a facilities of having or maintaining a electrical device like incubator. Those people who are living there can't afford such incubator by themselves. And the hospitals situated in those places are not moderate enough for providing those incubators for the critical conditioned infants. If also government provide incubator to those hospitals, the maintenance is not possible or available. Hence infants are dying rapidly. So our aim is to create a system for premature babies that can give them a perfect atmosphere around them, which will help them survive in there conditions with low cost and less maintenance. It also help in monitoring their body temperature, humidity, heart-beat. And also this body suit is a relief for parents who are busy with their daily work.

Android phones are common today. This system implemented by us will transfer the data of continuous measuring data of temperature, humidity and heart-beat with in a big range to the one or more than

one particular android phones. And also this system is able to give alarm to the parents at any danger condition. Also a doctor who can monitor the data will predict the problem with the infant's body if any.

LITERATURE SURVEY

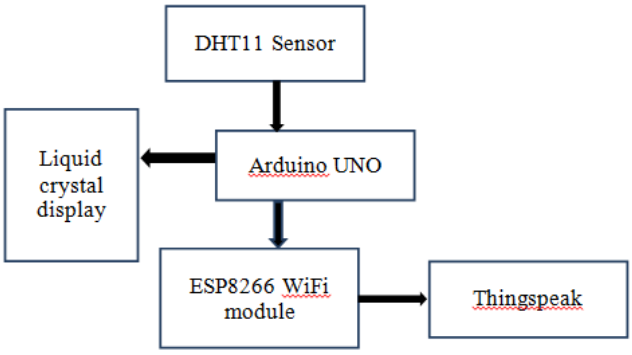
In 1985, Infants are nursed in incubators using either air mode control or skin temperature servo control. In 1998, Water permeability of the infant's skin is an important factor in the maintenance of a controlled water and heat balance. Radiant warmers and incubators are used to maintain the body temperature of newborn infants. In 2007; sophisticated electronics are within reach of average users. Cooperation between wireless sensor networks and existing consumer electronic infrastructures can assist in the areas of health care and patient monitoring. This will improve the quality of life of patients, provide early detection for certain ailments, and improve doctor-patient efficiency.

In 2009, In this paper, they propose the application of wireless transmission technology for neonatal monitoring at NICU. Software is developed for ensure the correct data transmission, detection and display. The system is designed to be suitable for integration into a non-invasive monitoring platform such as a smart neonatal jacket. Some interesting aspects related to the wireless transmission at NICU were briefly touched during the later stages of the project, which are highly relevant for future development. Firstly, for demonstrating the transmission of multi modal data from different sensors, such as ECG and SpO2, the hardware and calibration of sensors as well as signal processing will need to be implemented with the integration of non- invasive sensors.

In 2016 ,in this article, they define and discuss some of the major challenges in the healthcare systems which can be effectively tackled by the recent advancement in ICT technologies. In particular, they focus on sensing technologies, cloud of computing, internet-of-things and big data analytics systems as emerging technologies which are made possible by the remarkable progress in various aspects including network communication speed, computational capabilities and data storage capacities that provide various advantages and characteristics that can contribute towards improving the efficiency and effectiveness of healthcare services. In particular, they focused on exploiting the advancements in the areas of sensor technologies, cloud computing, Internet- Of- Things and Big data analytics systems as emerging technologies that can significantly contribute towards improving the efficiency and effectiveness of healthcare services.

IMPLEMENTATION

3.1 BLOCK DIAGRAM: -



METHODOLOGY

Infants who born before 37 weeks of the gestation period, are nursed in incubators. But millions of infants are dying every year due to money and maintenance in hospitals and due to advanced technology. We are using node MCU as the wireless communication medium and as controller we are using ARDUINO UNO. First we will measure the temperature and humidity of the incubator and then transmit the data using Wi-Fi module to Thingspeak channel. If the data is above/below a set point set by the user then the controller will give the heating pad accordingly. The readings will be shown in the thingspeak channel screen. The dht11 and ky039 sensors will give continuous data and so we can know the temperature and humidity and heart-beat at any time. So using this model we can easily control the temperature, humidity and measure the infant's heart- beat. The sensor will give the reading continuously and the heating pad will relatively on-off. Thus the temperature will remains same and the infant will stay safe .

Arduino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin. Arduino uno: Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs -light on sensor, a finger on button ,or twitter message – and turn it into an output -activating a moto, turning on an LED.

FUTURE SCOPE

The future work is focused on the implementation of the monitoring system to monitor all the pathological parameters of infants in all the hospitals with common physician/consultant. This paper aim is to monitoring and controlling temperature within the incubator and checking the infant's heartbeat continuously. There is also a possibility of replace the power source by solar cell. In rural area there is a big problem in supplying of electricity .So this problem will also overcome in future implementation.

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A 1.2 Websites:-

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