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# SMART E-CRADLE USING RASPBERRY PI

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**Abstract** - This paper presents an idea to design a smart E-cradle which will help the parents to monitor & detect every activity of their baby even if they are away from home. In order to detect each & every activity of baby, different sensors are attached to the cradle: temperature sensing module for detection of temperature of a baby, BPM sensor to measure the BPM of the baby, a camera on top of the cradle for live video footage, sound sensor to detect the crying condition of baby and soil moisture sensor to detect whether baby huggies is wet or dry. If any abnormal condition will be detected then mail and message will be sent automatically to the registered mail id and phone number. When baby is in crying condition, if the sound level is more than the given threshold level then the cradle will swing automatically.

**Keywords** - E-cradle, Raspberry Pi, Soil Moisture Sensor

## I. INTRODUCTION

If both the parents are working then it is highly difficult to monitor their baby continuously. So we need to develop E-cradle that can help parents to have a continuous observation on their baby and can notify the same thing.

## II. EXISTING SYSTEM

Previously a lot of work done in this area. But the existing methods are limited to monitor a baby's vital parameters like crying condition, humidity, temperature and also have video surveillance. There is no automatic swinging and also human involvement is needed.

## III. PROPOSED METHOD

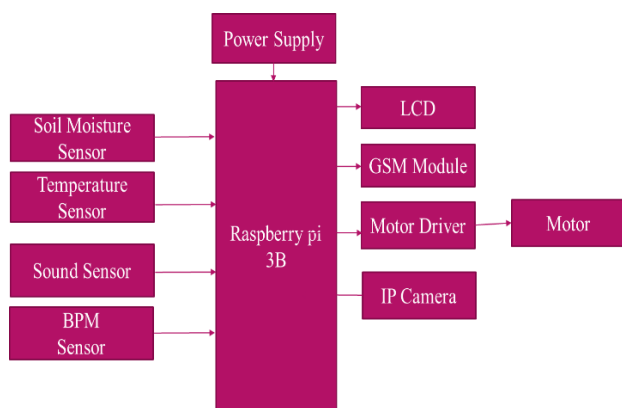


Fig.4(a) Block Diagram

In this block diagram soil moisture sensor is used to test whether baby huggies is wet or dry, temperature sensor is used to sense the temperature of the baby, sound sensor is used to detect the sound when baby is in crying condition, BPM sensor is used to measure the BPM of baby, IP camera is used for continuous surveillance. All the sensors are connected to raspberry pi board. If any abnormal condition will be detected then mail and message will be sent automatically to the registered mail id and phone number. When baby is in crying condition, if the sound level is more than the given threshold level then the DC motor will swing the cradle automatically. All the observed parameters will be displayed in the LCD.

## IV. EXPERIMENTAL RESULTS

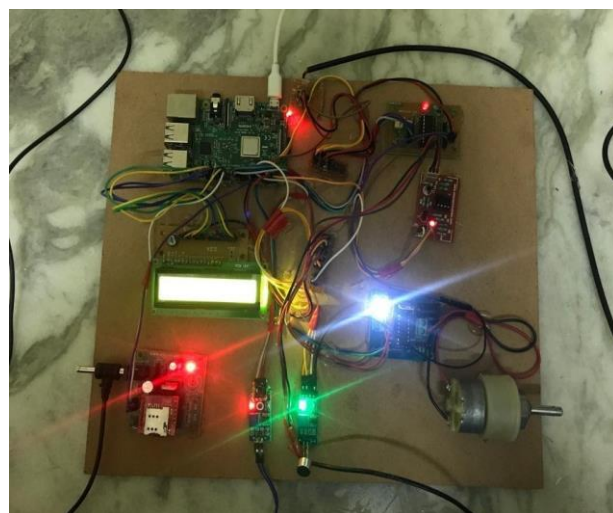


Fig.5(a) Plant Setup

The above figure shows the complete plant setup of the system, consists of temperature sensor, BPM sensor, sound sensor, soil moisture sensor and a DC motor.



Fig.5(b) Temperature sensor

The above figure shows the temperature of the baby. The measured temperature of the baby is 86.225F.

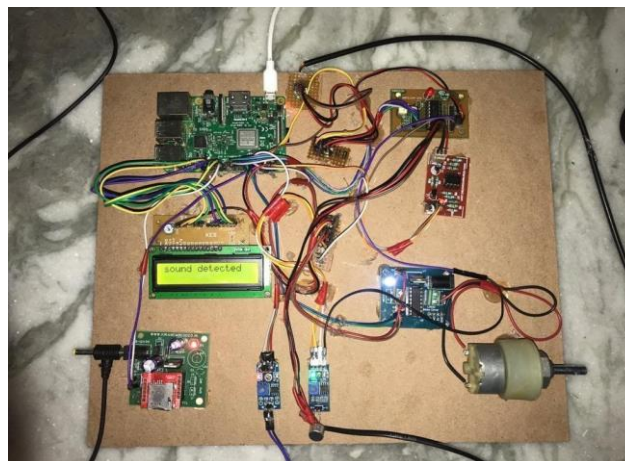


Fig.5(e) Baby Cry Detection

The above figure shows the crying condition of a baby. If the sound exceeds the given level, then alert will be sent to the parents and the DC motor will swing the cradle automatically.



Fig.5(c) BPM of a Baby

The above figure shows the BPM of the baby. The measured BPM of the baby is 61.



Fig.5(f) Sending SMS Alert to Parents

The above figure shows the sending of message to the registered parent's mobile number



Fig.5(d) Baby Huggies Wet Detection

The above figure shows that the baby huggies is wet. Then alert will be sent to the parents.



Fig.5(g) Sending E-mail Alert to Parents

The above figure shows the sending of email the registered parents mail ID.

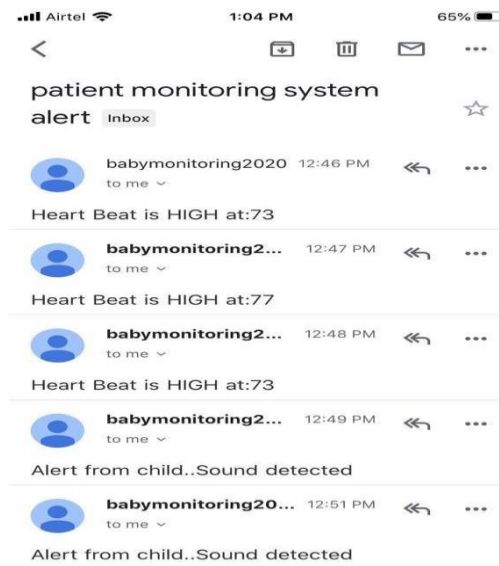


Fig.5(h) Email Sent to Parent

The above figure shows the mail received by parents.

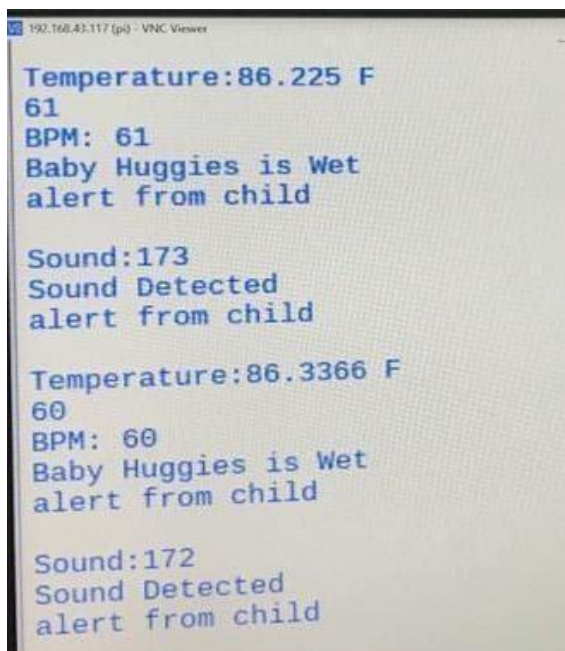


Fig.5(i) Output in VNC Viewer

The above fig shows the VNC viewer of different measured parameters of a baby by using various sensors.

## V. CONCLUSION

We proposed the design of smart E-cradle system using various sensors. This system provides several advantages in compared to the traditional method like automatic swinging and baby huggies is wet or dry using soil moisture sensor.

## VI. FUTURE SCOPE

In future it is possible to add mothers voice to the proposed method. Whenever the baby is crying then it plays automatically.

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