

INTELLIGENT CRADLE

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ABSTRACT-

Parents nowadays are engaged in their Professional life and do not have enough time to keep an eye on the baby. Working women have to manage both household work as well as office work, hence it is not possible to keep an eye on the baby all the time. It is also not possible for all the parents to afford a Nanny to take care of the baby. Housewives also find it difficult to sit near the baby and sooth them when required . In hospitals there are maternity as well as neonatal units to take care of the baby by nurses and sooth them. This system is designed to help parents as well as nurses in infant's care. Hence this design is an intelligent cradle which can take care of babies when parents are not around. This will happen by rocking the cradle and playing rhymes in the voice of the mother when baby is awoken/crying. The technique used to implement includes digital image processing for segmentation and morphological operation, voice recognition and GSM module for notifying parents.

KEYWORDS – Intelligent Cradle, Raspberry Pi, GSM Module, Rocking, Voice Recognition

I.INTRODUCTION

The main purpose of this project is to design an intelligent cradle which can take care of babies when parents are not around. This will happen by rocking the cradle and playing rhymes in the voice of mother when baby is awoken/crying.

- Cradle starts swinging automatically when baby is awoken.
- Playing audio (includes recorded voice of the mother lullaby etc) when baby cries.
- Sounds an alarm (or notify via message/call) when the baby cries for more than a specific time, which will indicate the the baby will be needing personal attention.
- Thus notifying Nurse, Nanny or Mother

The aim of this project is to design an intelligence cradle which will rock the cradle when the baby is awoken or crying. Dc motor is used to swing the cradle. Digital image processing techniques are used to detect if the baby is awoken. The cradle will also have an audio player where the voice of the mother singing lullaby will be recorded. If the baby continues to cry for a longer time, notification will be sent which will indicate that the

baby needs mothers attention. GSM/buzzer module will be used for intimating parents via message/call. This system can be used in hospitals/maternity units.

II.LITERATURE REVIEW

NAME SR.NO	TOPIC	AUTHOR NAME	YEAR OF PUBLICATION	METHODOLOGY USED
1.	A Detection System Of Infant Cry Using Fussy Classification Including Dialing Alarm Calls Function	Mohammad Kia, Shabnam Kia's,	Dec 2012	Fussy Classification, Calling Module
2.	Automatic E-baby Cradle Swing Based On Baby Cry	Dilip Kumar and Misha Goyal	Jun 2013	Wet Sensor Is Used
3.	Driver Drowsiness Identification By Means Of Passive Techniques For Eye Detection And Tracking	Marco Porta, Davide Gandini, Gian Mario Bertolotti, Andrea Cristiani	April 2010	Viola-jones Algorithm To Detect Face
4.	Rocking Motion Of The Baby Sleeping On The Mother's Lap: Modeling And Prototype Automatic Swing Cradle Design	Fatih Elmas, Abdurrahman Yilmaz, Muhammet Garip	May 2014	Accelerometer Analyser

III.METHODOLOGY

PROPOSED METHODOLOGY:

The condition that the baby is awake can be checked by either of the following ways:

- Gesture Sensing: Blinking of Eye-lid is checked using camera and image processing.
- Voice (crying) Sensing: "Voice recognition Module" is used to check for if baby cries through microphone and raspberry pi.

Obtaining these signs, signals will be given to the Micro-controller which will perform the intended works like swinging the cradle via DC Motor, playing rhymes etc using audio system and notifying the Mother or Nurse (nanny) after a stipulated time indicating baby requires personal attention.

IMPLEMENTATION FOR DETECTING THE STATE OF EYES:

The State of Eye is detected in following three states:

- The acquired RGB Image is converted into Y, Cb, Cr. colour space (Y-Luminance Cb Cr-Chrominance)
- Detection of Face and its Extraction.
- Detection of Eye from Extracted Face.
- Region of interest.
- Detection of the state of Eye.

FACE DETECTION:

Depending Upon the threshold values of the Y,Cb and Cr,the face is identified and segmented.

EYE LOCALISATION

- Region of interest technique is applied to the extracted image of face to locate the eyes.
- Morphological operations are applied on the transformed image to mark the region of interest(ROI).

IV.EYE STATE DETECTION

Based on the fact that pupil and iris area has less gray values than the other two white areas, the mean(μ) and standard deviation(σ) is calculated. The Standard value for the open eye is as follows: Mean(μ)>0.2 and Standard deviation(σ)<0.02.

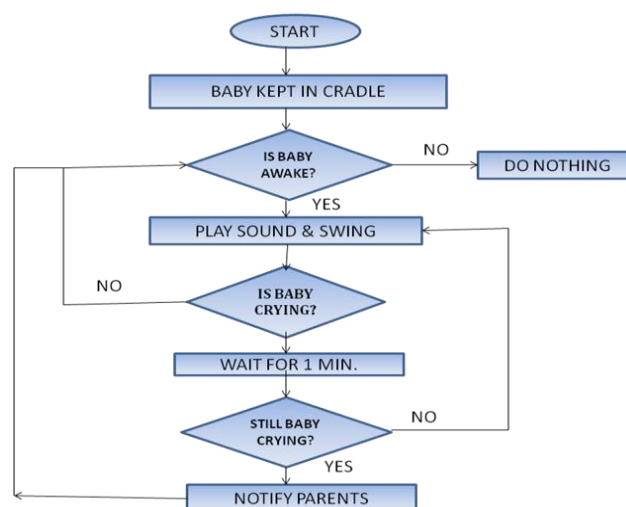


Fig.No.1 FLOW CHART OF ALGORITHM

ALGORITHM FOR EYE-DETECTION

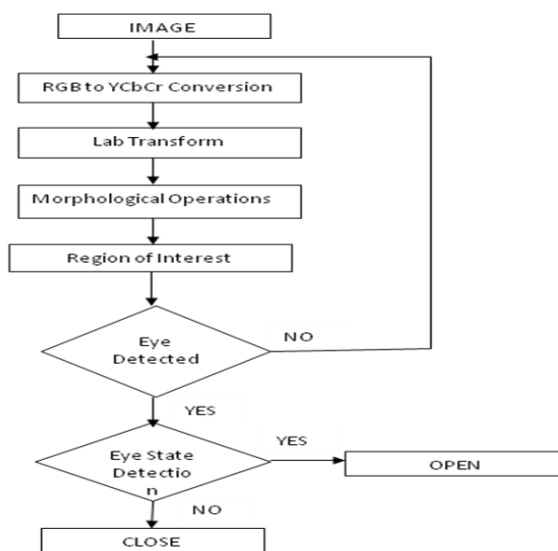


Fig No 3: ALGORITHM FOR EYE DETECTION

V.BLOCK DIAGRAM

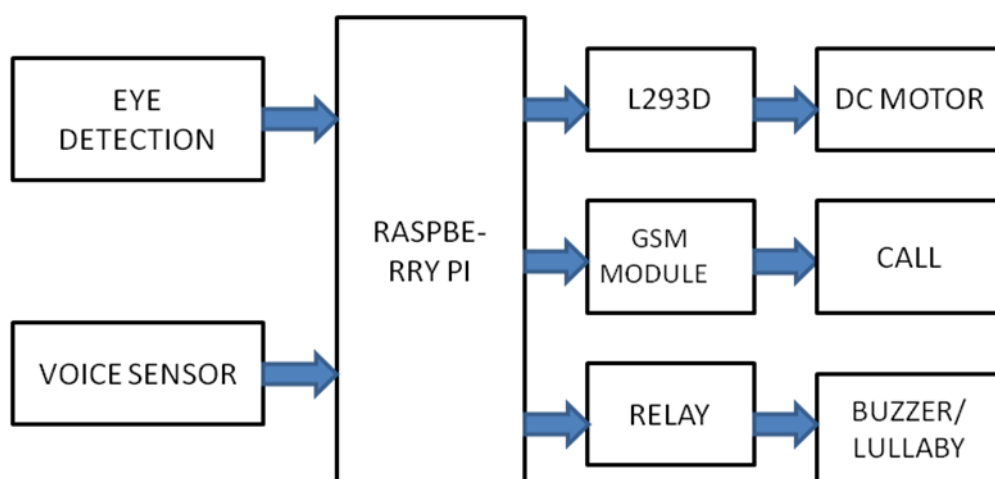


Fig No 3: BLOCK DIAGRAM.

VI.COMPONENTS USED TO IMPLEMENT IDEA

SOFTWARE REQUIREMENTS

1. Proteous
2. OpenCv (Software)
3. Wim32
4. 7zip

HARDWARE REQUIREMENTS

1. Raspberry Pi Microcontroller
2. SD Card
3. Microphone
4. Power Supply
5. Web Camera
6. Buzzer
7. Relay
8. Light
9. DC Motor
10. L293d Motor Driver
- 11.

VIII.MODEL OF INTELLIGENT CRADLE

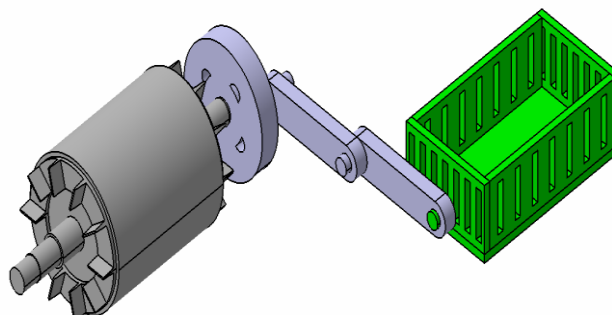


fig. MODEL OF INTELLIGENT CRADLE

IX.ADVANTAGES

- 1 It is very easy to operate and it's reduces the manpower work. The user can adjust the cradle according to their comfort and use.
- User can adjust the time as per need of the parent's how long cradle will move and the parents can finish their household work in that period.
- The one of the prime benefit of this cradle is we can use cradle at neonatal and maternity units in Hospitals which ensures the nurses to take care of infants and soothe whenever they require.

X.APPLICATIONS

- 1.It is used for baby care at home
- 2.It is used in hospital at neonatal and maternity unit.
3. To sooth the baby automatically according to their condition.

XI.CONCLUSION

In present day, an intelligent baby cradle is important. This device can be used to reduce the workload of parents by rocking the cradle when parents are not around and intimating them when personal attention is required. It is capable of detecting eye movement/cry of the baby and rock the cradle. This is done by using digital image processing techniques. I-cradle will help parents and infant to sleep peacefully during night time

REFERENCES

- [1] Shabnam Kia and Mohammad Kia's, "A Detection System Of the baby Cry where Fussy Classification will be used Including Dialing Alarm Calls Function" VOLUME 978-1-4673-2679-7/12/ ©2012 IEEE.
- [2] Dilip Kumar and Misha Goyal ACSD "Auto E-Baby Cradle Swing is based on Baby Cry. International Journal of Computer Applications (0975 – 8887) Volume 71– No.21, June 2013.
- [3] Marco Porta, Davide Gandini, Gian Mario Bertolotti, Andrea Cristiani, "Driver Drowsiness Identification By Medium Of Passive Techniques For the purpose of Eye Detection And Tracking" Fourth IEEE International Conference on Self-Adaptive and Self-Organizing Systems Workshop. Volume: 978-0-7695-4229-4/10 © 2010 IEEE DOI 10.1109/SASOW.2010.30.4
- [4] Paper given by google patents in 1966 titled "Baby Cradle-Like Carrier".
- [5] "Automatically rocking of the baby cradle," proposed by M. Blea and M. Harper, from Google Patents, 1973.
- [6] "Baby cradle rocked by electricity," put forth by Y. George published by Google Patents in 1949.

- [7] "Automatic baby crib rocker" presented by G. Wong, " ed: Google Patents in 1976.
- [8] "Surveillance tracking system using passive infrared motion sensors in wireless sensor network," published by B. Song, H. Choi, and H. S. Lee in Information Networking from year 2008. ICOIN 2008. International Conference on in 2008, pp. 1-5.