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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.

- A. Cradle starts swinging automatically when baby is awoken.
- B. Playing audio (includes recorded voice of the mother lullaby etc) when baby cries.
- C. 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.
- D. Thus notifying Nurse, Nanny or Mother.

II. LITERATURE SURVEY

[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 published paper which explained about a simple voice recognition system which can detect the cry of a specific baby which is already stored in the database. This uses fussy logic as they are easy to implement. Advantage of this project is Call Parents when baby cries and disadvantages of this project is there is no option for rocking the cradle, complex algorithm. [2] Dilip Kumar and Mishaa 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 implemented a low cost automatic cradle. This cradle detected the crying of the baby and start swinging the cradle till baby stops crying and it has an inbuilt alarm to check the bed conditions if it is wet or not. Advantage of this project is low cost as only alarm is used and disadvantage is there is no features for notifying parents. [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 presented a system whose goal is to check if the driver is drowsy which will reduce accidents due to lack of concentration of the driver. This can be used by fitting a webcam in the car and operating with some software techniques. Advantage of this project is prevent accident and disadvantages of this project is failed in extreme low light condition.

III. PROPOSED WORK

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.

IV. IMPLEMENTATION

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

A. Gesture Sensing: Blinking of Eye-lid is checked using Digital Image Processing (DIP) technique.

B. Voice (crying) Sensing: “Voice recognition Module” is used to check for if baby cries.

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

V. BLOCK DIAGRAM

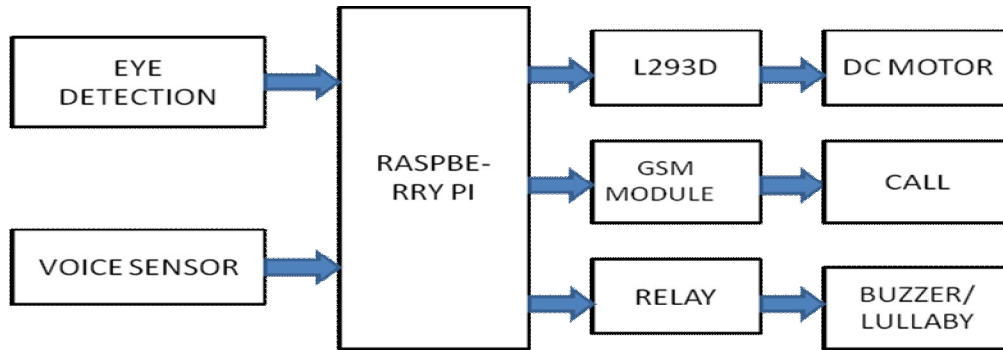


Fig. 1 Block Diagram

VI.FLOWCHART OF ALGORITHM

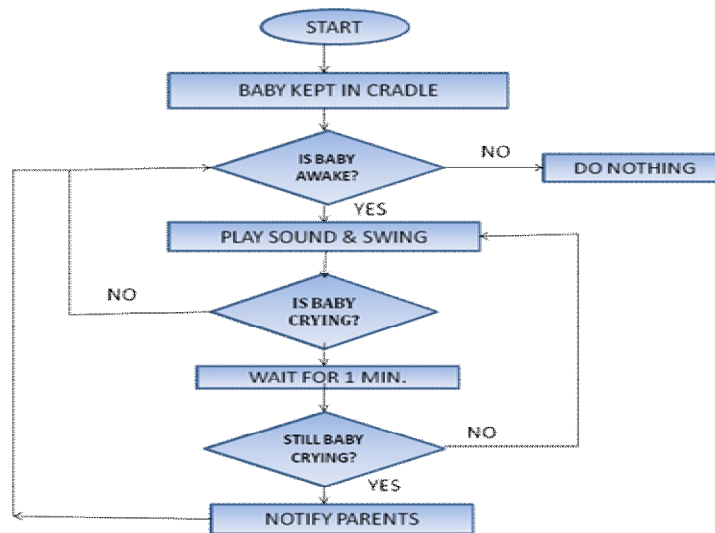


Fig. 2 Flowchart of Algorithm

VII. CONCLUSION

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

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- [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
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