Baby Motion and Cry Detection

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***Abstract* - Acoustic means the sense of hearing or relating to the sound and acoustic analysis is the means the measurement of cry signals of a baby, and the likely cause of cry. The acoustic analysis also helps in understanding the physiological and emotional behavior of the baby. In the early studies of the acoustic analysis it has been carried various signal processing techniques to characterize the cause of cry of the baby. The proposed work which is the ICMCDS(Intelligent Cry Monitoring and Cry Detection System) is used to help the parents who are working and they need to leave their babies in the care centers and crèches or with care takers at home and they remain worried about the well being of their babies. Intelligent Cry Monitoring and Cry Detection System (ICMCDS) will help the working parents by notifying when their child cries. The development of the proposed system is at low cost. The systems first detect the babies cry and notify it to the parents by sending an SMS to the registered mobile number i.e., is the parent's mobile number. The audio visual sensor which is the sound sensor which is present in the robot will sense the baby cry and alerts the parents by sending a message about baby crying. To communicate with the robot by the human Wi-Fi media is used.**

Keywords— Monitoring; cry detection; ICMCDS; Signal processing; Auto-correlation.

I. INTRODUCTIN

Due to the busy lifestyle of the human being this truly affects the basic livelihood of the human being. In busy lifestyle parents tend to concentrate on work and they forget to take care of their babies. It is more an issue with the newborn babies as the Babies need constant love and care .It negatively affects the working parents because they are not able to concentrate on their work worrying about the well being of the baby. In order to support this delicate balance and so that the parents can concentrate on their work, the parents need to be constantly aware of the wellbeing of their child. A child cry detection system is proposed that could constantly monitor the state of the baby through audio-visual sensors and through notifying about the baby.

II. LITERATURE SURVEY

Pruthvi Raj Myakala et al., [1] proposed the acoustic analysis for cry signals which will helps to understand the physiological and emotional condition of a baby and cause of cry. They also proposed an intelligent cry monitoring and cry detection system which helps to the working parents who are worried to leave their loved infant with the caretakers and they will be worried about their baby. We are aware of this busy schedule of every working parents , therefore not working parent will be available for every seconds to take-care of their babies, especially when they are kept in day care centers, home etc. It also has a negative thought that affect to their work as they will be worried about their babies.

Briones.R.L. et al., [1] explained by conducting the interview. To which American Red cross Forty people were assembled in that interview, they explore the benefits of social media which helps in communicating with public, as a result from that interview the people were aware of importance of social media for this digital age to help them to have a communication with public through Twitter and Face-Book, with barriers such as lack of stuff and time and opportunities to improve national headquarters and local chapter relations. From this American Red cross the practice to built strong relation with public for both scholar and professional was improved by the use of social media.

Scalassara et al., [2]. Explained that the voice acoustical analysis non-linear methods and comparison of quantities obtained from information theory has been increasing rapidly from past few years. To acquire the knowledge for the evolution about the pathological voice signals. They analyzed the characteristics of the entropy rate cure and its asymptote. It is specifically for the patients who nodule with the vocal folds. They analyze that there is a differences between the nodule of the patient and healthy signal when related to the level of pathology.

III. PROPOSED WORK

The robotic platform has pi camera connected to it which captures the real time video of the baby and its surrounding and the video streaming can be seen by the parents by giving the control commands to the robotic platform. The control commands given by the parent is through Wi-Fi medium in which the robotic platform is being connected. The parents uses the Video streaming to view the condition of the baby and it also helps to know the about the baby cry. The parent also get the notification of the baby cry through the GSM Module present near the baby and gets to know when the baby is crying and is baby crying for long or not.

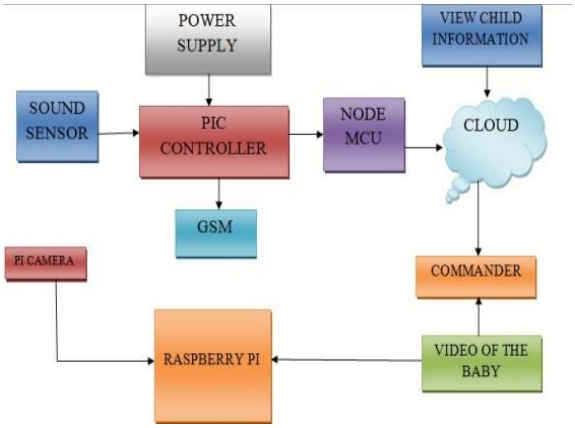


Fig. 1 Block diagram

- *Sound Sensor:* The sound sensor helps to sense the baby cry and it gets activated and notifies it to the PIC Controller about the baby cry.
- *PIC Controller:* The PIC Controller receives the baby cry signal from the sound sensor and it has two main functions as following.
    - To activate the GSM Module.
    - To upload the information about the baby cries to the Node MCU.
- *Node MCU:* The baby cry signals uploaded from the PIC Controller is to be uploaded on to the cloud to access the information about the baby if the parents are not able to see information at the real time.
- *GSM:* The GSM will send the baby cry information to the parents through SMS. As soon as it receives the baby cry signal it will send the SMS to the parent's number which is being registered while coding.
- *Raspberry Pi :* The Raspberry Pi is the heart of the system and it will be present at the Robot part which will go near the baby and Switch ON Pi-Camera to capture the video and it will be sent to the server from there the parents can view the child information and can see the video of the baby. As we know that the Raspberry Pi acts as CPU and we can connect the laptop or the monitor to it.
- *Pi Camera:* The pi camera is connected to the Raspberry Pi and the pi camera will capture the live video of the baby and its surroundings and it will be sent to the cloud server
- *Cloud Server:* A cloud server will be given to the parents so that they can access the virtual network to see the live video which will be stored in the cloud server.
- *Commander:* The Commander is the parents of the baby who can control the movement of the robot by giving the commands through the cloud server of the raspberry pi and can view the surrounding of the baby through the robot movements.
- *Power Supply:* About +5V of power is used.

IV. RESULT

Fig.2 Video Monitoring

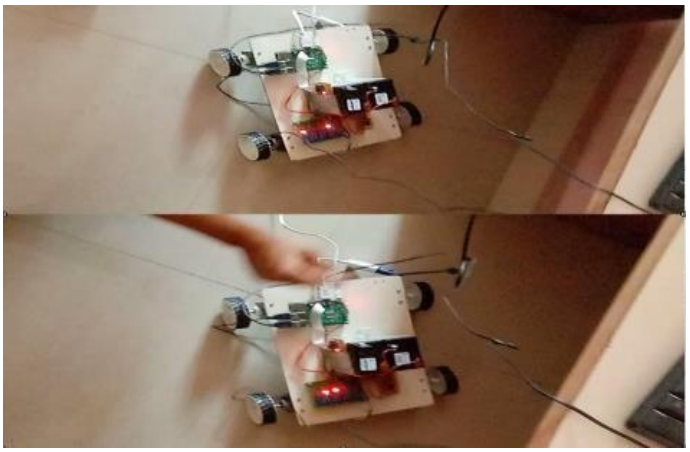
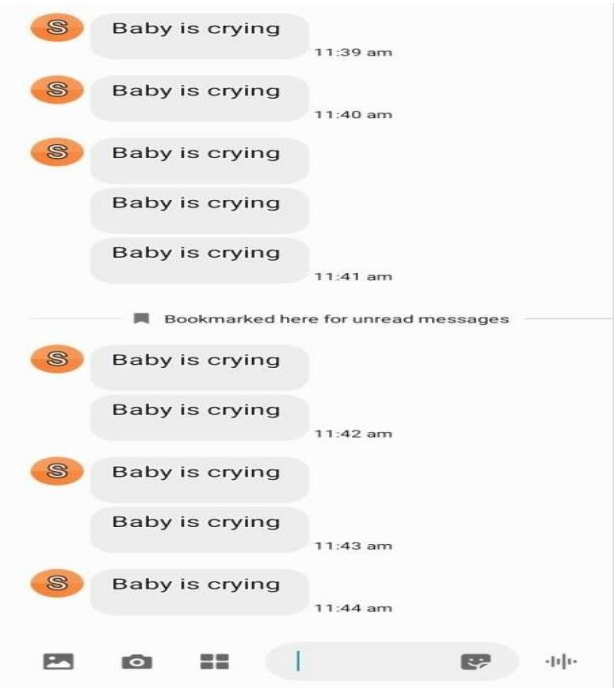


Fig.3 Robot Movement



V. CONCLUSION

The ICMCDS is developed for child cry monitoring and real-time information in this paper. This is used to reduce the parent's sadness of being away from their children by informing them about their child cry through SMS and by being able to see the child in real time through video monitoring. There are mainly three units in the system which are messaging unit, monitoring unit and sensor unit. Messaging unit helps to notify the parents about the baby cry. Monitoring unit helps the parents to view the baby and its surrounding. Sensor unit helps to detect the baby cry. In future, we can the cause of the baby cry and notify the parents about the baby cry with cause of the cry.

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