

Review on Biometric Security System for Newborn Baby

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ABSTRACT

Newborn swapping and abduction in hospitals are challenging issues which occurs all over the world. Traditional method to combat this problem have their own drawbacks, here a real time solution is provided by proposed model having five modules on raspberry Pi. Implemented module consisting of one camera for providing real time security against culprit who lifts the baby from cradle. Additionally a temperature sensor is used which gives the continuous updates about the baby's health to medical staff and parents. The results of implemented modules shows that we can get the real time alert about culprit which will be easy to find out person who lifts the baby from cradle and also continuous data of temperature of baby's body of providing time to time attention towards health. Proposed system has modules for scanning and matching of footprints of baby and hand impression of mother which provide a low cost solution to the newborn swapping rather than the expensive DNA procedures.

Keywords: Raspberry Pi, Cradle, Biometric, System on Chip, Pattern-recognition.

I. INTRODUCTION

The Newborn swapping and child abduction are challenging issues. NCMEC maintains statistics regarding the number and location of infant abduction. The percentage of infant abduction between January 1983 to June 2016 organize by general location of abduction says 43.46% child got missing from health care centre. The percentage of infant abduction between January 1983 to June 2016 organize by specific location within health care facilities says 58.65% child got missing from mother's room and 15.79% got missing from premises.

Traditional methods of identification of such child have some drawbacks. Biometric system is a pattern-recognition system recognizes a person based on feature vector derive from a specific biological characteristic such has physiological biometric

identifiers include fingerprint, hand geometric, ear patters, eye patters(iris and retina), facial features, and other physical characteristics. Behavioural identifiers include voice, signature, key stroke, and others. The present method of footprint, fingerprint acquisition in hospitals in inked footprint of the newborn along with the fingerprint of the mother. This is stored in file which forms the medical database. This method of image acquisition is offline. Another method of practice is to tie a number band around the hands/legs of the newborn as measure of identity. This number band is same as the one which is also tied to the mother of the infant.

At the time child kidnapping or abduction, mixing of babies, multiple claims for an infant in any hospitals, birthing centres causes emotional breakdown and confusions. This raises a question on the effectiveness of the offline methods and the method of tying

number bands (ID bands). This eventually leads to the DNA test at times. Hence, biometrics can be used to solve such identity issues. In the online system, by a digital source and computers are used for processing and storage. The newborn's footprint images captured using a high resolution camera. The fingerprint of newborn's mother acquired by a fingerprint scanner. Where in footprint of newborn and fingerprint of their is used for recognition. The image acquisition done in the primary health centre. Further, implementation bimodal authentication in hardware as embedded system enhance the over all performance of the system has a standalone device. A complex IC that integrates the measure functional elements such has programmable processor, on chip memory, accelerating function hardware eg.GPU, both hardware and software, analog components into a single chip or chipset is called system on chip(SOC).Thus, reduce overall system cost, increase performance, lower power consumption and reduce size and draws low power.

Here, a newborn personal authentication system is implemented for this issue based on bimodal biometric system. The Raspberry Pi is to build a low-cost device. It works in Linux platform, in this paper, discusses about the implementation of bimodal biometric (fingerprint and footprint) in Raspberry Pi. Debian Linux platform optimized for ARM architecture is been used. An open source computer vision Open CV is used for biometric programming. It has C++, C, Python and Java interfaces and supports Windows, Linux, Mac OS, iOS and Android. It takes the advantage of the hardware acceleration of the heterogeneous compute Platform. The Open CV library is installed from repository by following few commands to execute the installation of dependencies, downloading and decompression of Open CV, compilation and installation of Open CV in Debian Linux. Appropriate algorithms are used for reliable recognition process of Newborn is employed also temperature sensor is provided with above system for continuous health monitoring with camera is placed on baby's cradle for security to avoid baby swapping.

II. LITERATURE REVIEW

[1] The newborn swapping and abduction in hospital are challenging issue. Traditional method have their drawbacks. Hence a newborn personal authentication system is proposed for this issue based on bimodal biometrics system wherein footprints of newborn and fingerprint of mother is used for recognition. This concept is on raspberry pi which involves open cv library into linux.

This paper discuss the implementation of low cost ambient newborn authentication system based on biometrics trait of the infant mother fingerprint.

[2] DNA profiling has proven to be powerful technique for human identification, besides its usual application n criminal offense for identifying a crime is also used parentage and kinship determination basically the proposed a software for identification. Though this is very accurate but very time consuming and costlier process.

[3] Using face biometrics for helping with the identification of missing children. The basic technologies involved in such situations are face recognition, identity verification and age progression. The problem addressed by age progression on the sets of images and subsequent hypothesis verification based distribution of extracted features. The overall exercise revealed no of problem. The main problems are quantity and quality of images involved accuracy of the age progression process.

III.BLOCK DIAGRAM

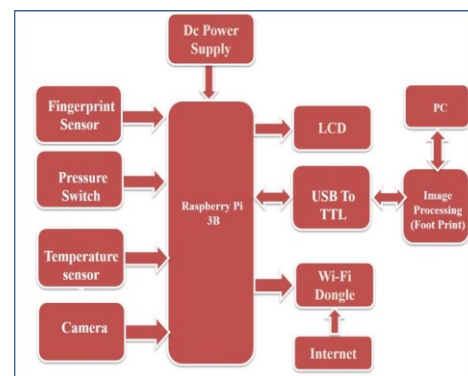


Fig 1. System Block Diagram

Above is the block diagram of our project in which we are using raspberry pi, which is the heart of our project. In which we are using 3B module of raspberry pi and we are going to interface different type of sensors and scanners with the raspberry pi. Firstly we are going implement camera on the door and that camera will be interfaced with the raspberry pi. It will monitor the baby continuously and PIR sensor will capture the images if any intruder comes between the baby and the camera. Then we are using fingerprint scanner and footprint scanner respectively to scan the fingerprint and footprint of the mother and new born baby. All the information is then saved as database. Even we are using temperature sensor which will continuously monitor the temperature of new born which will be displayed on LCD display screen. Now all the data of the baby is then send to the hospital authority via internet.

IV. ADVANTAGES

- Use to check various parameters of the Air Pollutants by just one click.
- It Provides real time parameters value.
- Consumes less time.
- Use from anywhere in the world by using internet.
- Wirelessly Alert from anywhere in the world.

V. APPLICATIONS

- Process control industries
- Environmental monitoring
- Fire detection
- Weather Report monitoring
- Detection of harmful gases in mines
- Home safety

VI. CONCLUSION

In this project we are providing security to the newborn at the hospital. But in case, the baby got swapped or got abducted we can recognize the baby by using the data based which is being saved. Biometric identification techniques is a great tool.

While discussing of all the available biometric authentication systems, technique of matching of fingerprint and footprint of mother and infant is very effective because it is low cost solution to the newborn swapping.

VII. REFERENCES

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