Doorbell Alert System and Health Monitoring For Deaf and Blind People

Arya Panikar[1], Mansinghani Divya[2], Kulkarni Shravani[3], Suryavanshi Lalita[4]
[1,2,3,4]*Department of Computer Engineering, PVG's College of Engineering, Nashik*

***Abstract*- The people who are Deaf and blind people face everyday challenges in identifying the occurrence of household sounds like door bell. Designing and implementing a low cost stand-alone device for deaf people for notifying the doorbell ringing who live alone in their house. Face image will be capture face will be recognize if the person is known is or unknown, and alert using vibration pattern. Health monitoring system is provided which will track the heartbeats, temperature and location of a person. Proposes a low cost, reliable and efficient system to alert the deaf or hearing im-paired person consisting of two modules- a transmitter installed at the door and another is the receiver, a wearable device. In this project camera which is situated at the door will be continuously on. before that there will be the database of raspberry Pi in which images of some known persons or family members are stored. when anyone arrives at the door camera will detect the face of that person, compare it with the images stored in the database and detect if the person is known or unknown, as the face detected signal transmitted from transmitter to receiver and vibrator will vibrate according to defined pattern(5 sec for known person,3 times per second for unknown person). This system provides various vibration pattern which will help blind people to recognize known or unknown person. Also system track the location of person by using GSM/ESP8266.The System contain Health monitoring, it will check heartbeats and temperature of person using thinkview.**

Index Terms- Bluetooth, GPS, GSM, Raspberry pi, vibrator

1. INTRODUCTION

This project proposes a low cost, reliable and efficient system to alert the deaf or hearing impaired person using a wearable device. This project also consists of a health monitoring system for deaf and blind people which can also be used for old people. Hearing loss presents many everyday challenges. Communication may be the biggest challenge of all getting and giving information, exchanging ideas, sharing feelings-whether in one-to-one contact or in groups. Sometimes there are small disruptions of daily life that result from reduced hearing. Many devices and systems are available to help deaf and hard of hearing people improve communication, adapt their environment, and function more effectively in society. Alert systems, or simply signalers, are designed to help notify different events, such as the phone ringing, the doorbell, a baby's cry, motion, weather alerts, or smoke alarms. It usually happens that the deaf people are unaware of the visitor to the home and also the old age people have difficulties in walking or moving to go and see who is at the door. So it would be of great help for those people if they have alert about the visitor to home and can know who is at the door?. The proposed system here is designed to alert the hearing impaired and old age people about the visitor.

The proposed system here is designed to alert the hearing impaired and old age people about the visitor. There are two modules in the system - a transmitter and a receiver. The transmitter is the device installed at the door. The transmitter consists of Raspberry Pi, RPi camera, video or doorbell. The receiver is the wearable device which includes Raspberry Pi, Bluetooth, message and vibrator to alert. Visitors image along with date and time will be sent to the server for retrieving information later. The major advantage of the system is that it reduces the visitors waiting time and can also help in the security of the deaf/elderly. This system uses an Raspberry Pi, transmitter, receiver ,vibrator, RPi camera for alert system. Whereas for health monitoring heartbeat sensor, temperature sensor, GSM and GPS module is used. The data is stored at the thing speak server and displayed in the thing view application.

Moreover, a fused template stored in the system memory, can reveal more data about enrolled users.

This is why that nowadays multi-biometric template protection is a serious challenge for researchers when they want to apply cryptographic methodologies to protect the templates stored in a biometric system. In the current study, we propose a new concept in biometric authentication called “digest”. It saves a print of client biometric traits, which is output of a one-way function. Through applying the digest, we do not need to encrypt and decrypt biometric information, as well as we can utilize many efficient properties including homomorphic and Hamming distance. Computing digest is fast and nobody can discover any primary biometric information using a digest.

2. LITERATURE REVIEW

A robot using doginspired visual communicational signals to communicate intention is designed by K. L. Koay et al.[1]. Robot was able to lead participants to the microwave door and front door sound source. The movements of head and directions of gaze were important for communicating the robots intention using visual communication signals. Gopinath Shanmuga Sundaram[2] attempted to build a low cost standalone device which transmits data using the Raspberry Pi with Bluetooth and has a resistive touch screen display providing a user interface. Error handling techniques were used to catch the exceptions and were able to retransmit till the acknowledgement was received. Chao-Huang Wei and Shin-An Chen[3] employed a novel power line communication chip to develop a networked digital video door phone system to replace the conventional ones. Door Phone is used to identify visitor or for simple voice interlocution. The audio visual information id transferred . Mahdi Safaa A. et al[4]designed the handheld device for obstacle detection using ultrasonic sensor and generate voice alert for blind and vibration alert for deaf person by keeping his finger on the button at the top of the device. The device is suitable and easy for blind and deaf with 40-150cm range and can be used in three dimensions. Huiping Huang, et al.[5] presented a solution for establishing a low power consumption remote home security alarm system developed by 4 applying WSN and GSM technology is presented. The detection of the theft, leaking of raw gas and fire, and send alarm message remotely is done. The advantages of system is reliability, easy usage, complement wireless, low power consumption and the system also has practical value in other fields. The design and implementation of a low cost, low power consumption, and GSM/GPRS based wireless home security system is presented by Yanbo Zhao and Zhaohui Ye[6]. Jayashri Bangali1 and Arvind Shaligram[7] suggest two methods for home security system. The first system uses web camera. Security alert in terms of sound and a mail is delivered to the owner , whenever there is a motion in front of the camera. In the second methods SMS is sent which uses GSMGPS Module (sim548c) and Atmega644p microcontroller, sensors, relays and buzzers. This web camera based security system is easy, user friendly and software consists many features.

3. MOTIVATION

For doorbell alert system: It usually happens with deaf and blind people, that they are unaware of the doorbell sound and the person at the door. For health monitoring system: Recently, an incident happened near a mall that a person was suffering from heartache since 2-3 hrs. but no one was able to understand the symptoms of what was happening with that person. All this was recorded by one of the camera of the mall. In such case, this system will help to monitor the health for such person.

4. PROBLEM DEFINITION

This system provides facility for deaf and blind people which will notify them the arrival of person at the door as well as location tracking outdoor and health monitoring system.

5. PROPOSED SYSTEM

There are two module in our system: 1. Doorbell alert system -In this camera which is situated at the door will be continuously on.before that there will be the database of raspberry Pi in which images of some known persons or family members are stored. when anyone arrives at the door camera will detect the face of that person, compare it with the images stored in the database and detect if the person is known or unknown,as the face detected signal transmitted from transmitter to receiver and vibrator will vibrate

according to defined pattern(5 sec for known person,3 times per second for unknown person).

2.Health Monitoring System-The system also checks the temperature, heartbeats and tracks the location of a person and stores it at the cloud and then displays it on the thingview app.

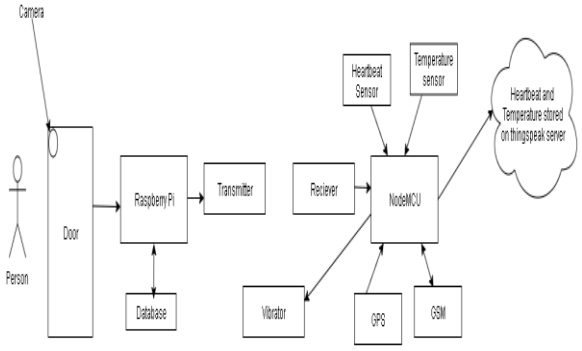

Figure 1. System Architecture

6. HARDWARE SPECIFICATION

1.Raspberry Pi 3 model B
2.Raspberry Pi camera
3.GPS
4.NodeMCU
5.Temperature sensor-DHT11
6.Power supply
7.Grove - Vibration Motor

7. SOFTWARE SPECIFICATION

1. Python: A widely used high-level programming language for general-purpose programming is Python.
2. OpenCV: OpenCV is a cross-platform library using which we can develop real-time computer vision applications.
3. Thingview: A new app to see Thingspeak charts on Android smartphones and tablets.
4. Raspbian OS: Raspbian is a free operating system based on Debian optimized for the Raspberry Pi hardware.

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