



# Low Cost Wearable Door Bell Notification System for Deaf People

Rahib Shaikh<sup>1</sup>, Priya Sherbhai<sup>2</sup>, Momina Shaikh<sup>3</sup>, Prof. Shiburaj Pappu<sup>4</sup>

B.E. Student, Department of Computer Engineering, Rizvi college of Engineering, Bandra, Mumbai, India<sup>1,2,3</sup>

Associate Professor, Department of Computer Engineering, Rizvi college of Engineering, Bandra, Mumbai, India<sup>4</sup>

**ABSTRACT:** Each issue the human race has ever confronted, innovation has offered its response. Innovation has now developed in every single part of the human world, from electric cars to clothes washer and so forth. Innovation has improved the existence of differentially able individuals from multiple points of view as well. Our inspiration for this task is deaf people respond to non-speech crucial sounds efficiently so that they can live a normal life. In this venture, a client module is structured which will advise the client at whatever point the doorbell is squeezed. The notice will be sent through a remote module (NRF) which covers a decent measure of range. One module will be hooked at the doorbell while others will be connected with the client module (a wearable gadget) with some LED and vibrating engine for the significant reason. These modules are constrained by the Arduino control Unit.

**KEYWORDS:** Arduino, Wireless module (NRF), vibrating motor, LED, clothes washer, electric cars.

## I. INTRODUCTION

Innovation has consistently given a stage to individuals with incapacities. From helping a visual impaired read a book to enable a quiet to talk and get included for a discussion. As we are progressing into the innovation, we are attempting to make machines more intelligent and more brilliant so human lives can be improved to a more noteworthy degree. The intensity of advancement is with the end goal that now an individual can check their wellness level on their portable application, they can check the nature of rest just by tapping the application on the cell phone. These highlights that science give us are so easy to use that individuals of all age gathering can use its advantage. We have arrived at that level in the field of innovation that presently it's conceivable to do the inconceivable. These advances alongside filling its need additional help to support the certainty of individuals who thinks they are vulnerable and sub-par compared to other people. Not every person can manage the cost of careful methods so as to determine there hearing issues. Because of assistive innovation, they can do or possibly attempt to do things that once were troublesome. A system like Speech treatment helps kids/grown-ups train their voices with the goal that they can enhance their pitch, a volume which causes them to fortify their voice. Numerous foundations follow this treatment procedure for their patients. While then again devices like shrewd gloves interpret the American Sign Language into discourse so they can impart around with others. The Gesture acknowledgment is finished with the assistance of sensor glove which comprises a couple of accelerometers, a microcontroller, and Bluetooth chip which are fixed on the fingers, in light of the examination of American Sign Language signs. The idea of deciphering signals is finished by considering the hub direction concerning gravity and their comparing voltage levels are recorded [1]

How difficult it is live without one of the senses? This question alarms us to the profundity as well as causes us to see that they are so critical to the human body. Every single component of our body is essential to the point that we would never envision an existence without them. Our day to day travel through the streets of Mumbai caused us to acknowledge one question that was, how terrible is it to live without hearing anything? Accepting this as a test and our desire to help those individuals we thought of building up a keen gadget assist deaf people to fight their issues. The issue focused on was to assist deaf people to react to doorbells at whatever point squeezed.

## II. RELATED WORK

In our everyday life, we run over numerous no speech sounds that give us significant data about the environment. Matthews et al have indicated that it is so essential to distinguish different non-discourse sounds for hard of hearing individuals. They led interviews with hearing-impaired patients and typical individuals. A few instances of such sounds are companions or colleagues talking in a room, music or directions given out in the open spot, cry of kids and basic data like an alarm, wireless ring or doorbell ring. Sound representation for hard of hearing individuals, in this paper different procedures, have been broke down which are utilized to make sound mindfulness among hard of hearing individuals. Procedures that were dissected are Vibrational detecting, Flashing lights, Hearing pooches, Cochlear inserts. The graph for the equivalent is demonstrated as follow.



Vibration detecting makes familiarity with sound to make a vibration, for example on the off chance that somebody is strolling close by the client, the hardware will detect it and afterward the vibration will be created which will tell the client. The significant downside with such frameworks is that it relies upon the foundation of the house, the wooden ground surface will be better sensed than concrete tiles. Flashing lights causes the client to make familiarity with telephonic, doorbell sound. This methodology requires the hardware to be hooked up next to the user. Hearing dogs won't have a lot of effects so as to make attention to the surrounding. This strategy as a matter of first importance requires progressing upkeep and furthermore the dogs need to be prepared for every single imaginable sound. Still one can't ensure about this strategy on how successful will it be. The last strategy is cochlear inserts, this for no uncertainty increment the affectability of the ears however not every person on the planet can manage the cost of it. Aside from this, implantation can cause other medical problems like nerve harm which causes paralyses, loss of hearing that the patient recently had, ringing in ears and some more.

In the wake of breaking down all the strategies, we settled to build up a notifying system dependent on flashing LED and vibrating engine based methodology. Murniwati BT Anwar designed the Wireless notification framework for the hearing impaired. This project utilized PIC as a microcontroller alongside an encoder and decoder to control a few tasks like infant cry warning, doorbell notice and so forth. The creator has actualized numerous significant warnings, making the entire framework enormous. Wristband unit is likewise substantial making it hard for the client to wear for the entire day. It has restrictions on working in thick home conditions. Utilizing Arduino over PIC can be very favourable. Arduino covers all the unpredictability of microcontrollers. Arduino IDE gives an extraordinary spot to compose and code for installed frameworks. One can choose different boards, different port, can incorporate any library for the IDE itself. To program, an Arduino one basically needs a USB cable, while to program PIC a different PIC software programmer is required to upload the code. Effortlessness in Arduino's design and in its easy to understand condition gives Arduino a high ground than PIC. In this proposed paper, the goal is accomplished utilizing Arduino as a microcontroller. Likewise, the gadget created is minimal in size and in this manner it is wearable.

### III. SYSTEM DESCRIPTION

A smart doorbell notifying system aims to simplify the lives of deaf people. Remembering our objective which was to grow ease, light in weight gadget which could be a wearable one, we created gadget enables the disabled to do essential things which happen practically day by day. Envision a circumstance where an individual with hearing disability is home alone, and somebody knocks the door or rings a bell since the individual can't hear the knock or doorbell, the entryway won't be opened therefore the guest may leave. The circumstance would have been extraordinary if the individual inside would have some versatile/wearable gadget on which the warning would have been sprung up at whatever point the doorbell would have been squeezed, in this way helping hard of hearing individuals arrive at the entryway at whatever point the door is knocked.

Here the transmitter contains an Arduino module associated with a doorbell alongside a remote module, while the recipient's module contains Arduino, vibrating engine/blazing LED and remote module.

#### ARDUINO NANO: -

Arduino Nano has ATmega168/ATmega328P processor. Based on its processor its operating voltage is 5v/7-9v. It has CPU speed of 16 MHz, which is quite good. It has 8 Analog pins, 14 digital pins and 6 PWM pins. Its small size make it quite comfortable to be used in wearable projects [5].

#### WIRELESS TRANSRECEIVER: -

NRF24L01 is a trans-recipient which works in the ISM frequency range of 2.4-2.4835 GHz. It has an on-chip controller implanted in it. At the point when utilized in a power-down mode 900nA of current courses through it. The fundamental preferred position of these kinds of trans-receiver is the power dispersal is extremely negligible and they are minimal in size [6].

#### VIBRATING MOTOR/LED: -

Here the vibrating engine and LED are utilized for the sign reason in this task the engine utilized was of rating, DC 3V-70mA which was light in weight and had fast. Driven by any shading can be utilized. In this undertaking, a green-coloured LED was utilized

### IV. FLOWCHART

Here the procedure is divided into two fragments. The area above "Medium/Channel" is the transmitter's region and the region below it is the receiver's region shown in Fig 1. One Arduino unit will be connected to the doorbell. The Arduino associated over there will continuously screen whether the doorbell is pressed or not, if Yes, at that send the signal "open the doorbell" by means of the remote/wireless module. Furthermore, in the event that the outcome is



negative, at that point Arduino will constantly continue reading the status of the doorbell until it is squeezed. Presently on the receiver side that is the wearable gadget, the Arduino associated over it will check whether any sign has been distinguished or not, if yes, at that point the vibrating engine and with glimmering LED will start working. What's more, in the event that the outcome is No, at that point continue sitting tight for the sign until it is sent from the transmitter's side.

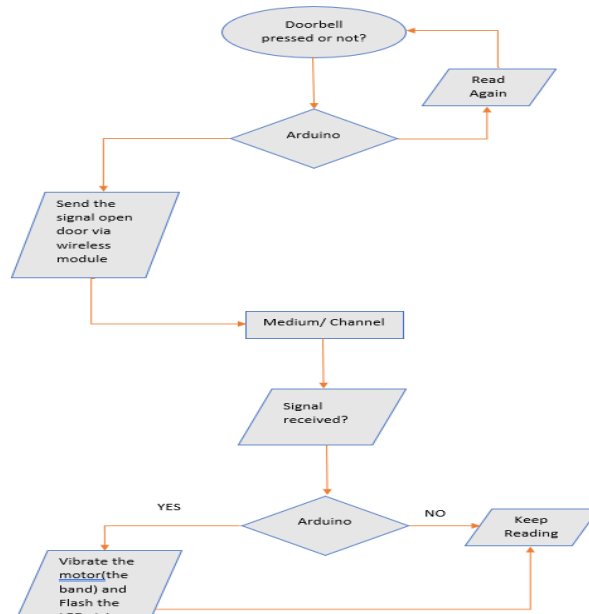


Fig 1: - Flow chart

**V. WORKING MODEL**

**Transmitter Module: -**

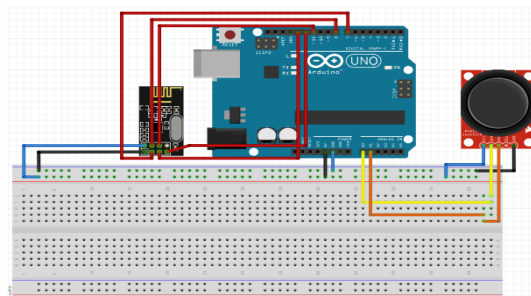


Fig 2: -Transmitter / Door-bell module

**Receiver Module: -**

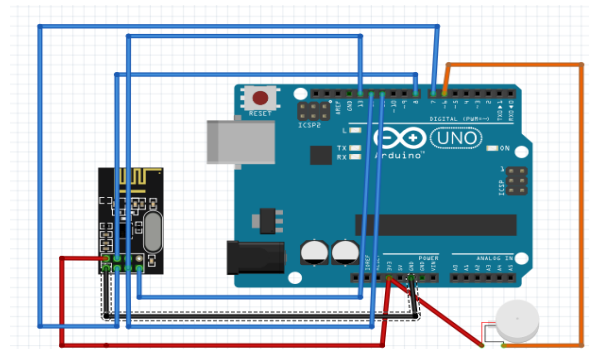


Fig 3: - Wearable Device



Led-Strip Module: -

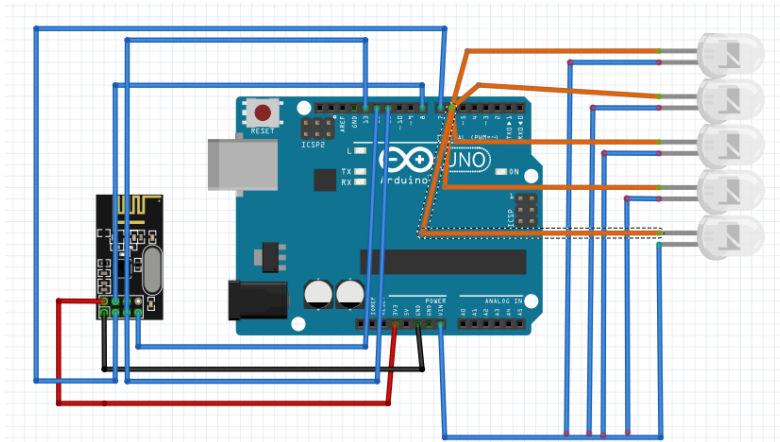


Fig 4: - Receiver Led Strip module

## VI. CONCLUSION AND FUTURE WORK

The extension and utility of this gadget can be expanded by adding more highlights to it. Including sensors like gas, sensors would permit the client to get away or call any of the individuals for the assistance if on the off chance that there's a fire made up for lost time in the spot or close to the encompassing. Aside from including gas sensor a commotion level observing framework can be executed on the gadget, this will empower the client to react against the clamors present in his/her environmental factors Not just this, however, it will likewise assist the client with responding against crisis alarms like fire douser truck's sound, Police van's sound or Ambulance vehicle's sound. This will keep the client alarm of his/her condition. Besides, an extra thing that should be possible to make the correspondence procedure easier to use and achievable is that a portable application can be created and could be introduced on the various individuals from the house. An extra catch will be given on the wearable module, at whatever point the client gets caught in any of the circumstances like if the individual is bolted inside and can't open the entryway, at that point that individual can press the catch, which will quickly inform different individuals from the house about the circumstance of the individual. This button can also be utilized for cases when the user needs some kind of help from other members.

## REFERENCES

- [1] Sriram, N., and M. Nithiyandham. "A hand gesture recognition-based communication system for silent speakers." Human Computer Interactions (ICHCI), 2013 International Conference on. IEEE, 2013.
- [2] Matthews, Tara, Janette Fong, and Jennifer Mankoff. "Visualizing non-speech sounds for the deaf." Proceedings of the 7th international ACM SIGACCESS conference on Computers and accessibility. ACM, 2005.
- [3] Jimmy Azar, Hassan Abou Saleh and Dr. M. A. Al-Alaoui. "Sound Visualization for the Deaf," Univ. of American university of Beirut faculty of engineering and architecture, Rep. p. 3/27-6/27.
- [4] Munirwati Bt Anwar. "Wireless notification for hearing impaired," M. Eng. thesis, Faculty of Electrical Engineering, Universiti Teknologi Malaysia.
- [5] Various Arduino boards and its comparison. [Online]. Available: <https://www.arduino.cc/en/Products/Compare>
- [6] Specification about the wireless transceiver. [Online]. Available: [https://www.sparkfun.com/datasheets/Components/SMD/nRF24L01Plus\\_Preliminary\\_Product\\_Specification\\_v1\\_0.pdf](https://www.sparkfun.com/datasheets/Components/SMD/nRF24L01Plus_Preliminary_Product_Specification_v1_0.pdf)
- [7] Specification about the Nokia 5110 LCD Screen. [Online]. Available <https://www.sparkfun.com/datasheets/LCD/Monochrome/Nokia5110.pdf>