

Creation of smart glasses to help the hearing impaired

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Engineering problem/solution

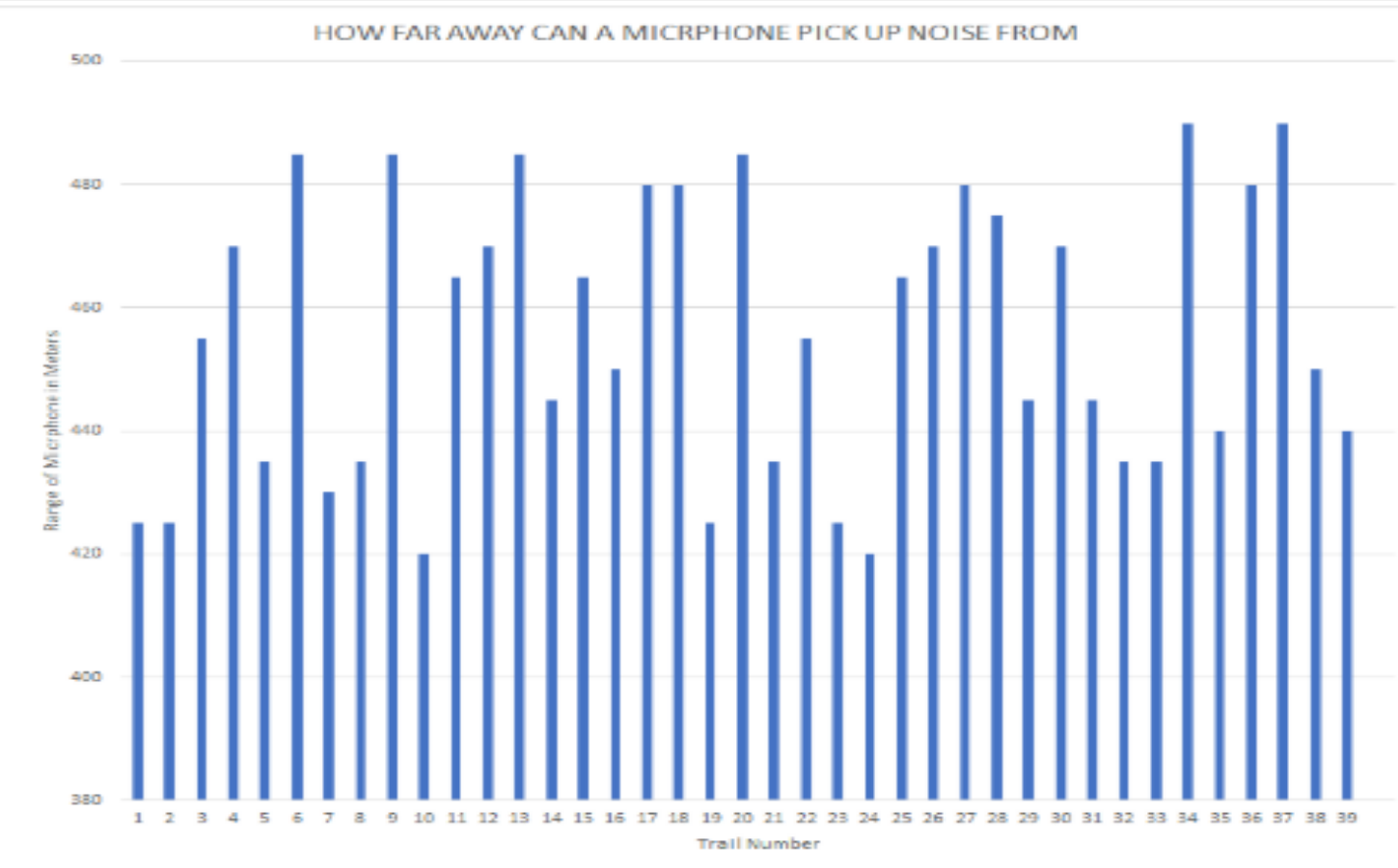
One problem that many people experience is being unable to hear people around them. One solution to this problem is seen on TV when there are subtitles at the bottom of the screen to help the hearing impaired read the words. Google took this a step forward by making a live transcription app that basically turns real time text into words on the phone screen. One issue with googles solution is that the user will need to look at their phone everywhere they go. This product solves this problem by putting real time subtitles in the users field of vision with the use of smart glasses

procedure:

- Plug Arduino board to computer using an android charger
- Go to https://www.arduino.cc/download_handler.php and open the .exe file and go through the installation process
- Go to https://drive.google.com/openid=1IQutU_Zx963qmltY4e1zbTr5PT71I08M and download the Arduino file that says ISR screen and download it. and open the file and press upload to board
- Hook up Arduino to transparent display by connecting display to spi port
- Get an Android phone and go to the Play store and search for MIT app builder and install the application
- On the MIT App builder application press connect to QR code
- On computer go to <http://ai2.appinventor.mit.edu/#6144477298819072> and press connect using ai companion
- scan qr code on phone
- unplug Arduino and attach lipo battery to white plug in Arduino board
- on the phone press select Bluetooth device and choose ssp2 then press connect and press start speech to text
- hot glue battery and Arduino board to side of sunglasses
- attach Velcro strips to top of transparent display and top some to a little below your eyes
- attach display below eyes

Table 1 :DISTANCE MIC IS ABLE TO PICK UP NOISE FROM(M)

Mean	Standard Deviation	Variance	Number of trials
455.58 M	22.72	516.29	39



Literature Review

- **Product allows user to see the text that is being spoken round them.**
- **This would help hearing impaired live everyday life more normally**
- **This solutions goes a step forward then googles solution because this solution allows the user to have face to face conversation instead of having to look down at a phone to understand what people are saying**
- **This product is possible because of the use of a transparent oled screen which reflects light to the user's vision.**
- **The audio to text conversation happens in a phone where the text is sent through a Bluetooth connection to the Arduino**

Results/conclusion

The purpose of this project is to make glasses to help people with bad hearing live everyday life normally. The hypothesis of this project is that the user will be given accurate subtitles and will be able to effectively read the subtitles without any issues. The results agree with this hypothesis because the words someone said can be picked up from 500 meters using the microphone the product uses. The glasses also clearly projects words to the eye. one systematic error that happened while conducting this experiment is that people in the hall that we were doing this experiment in started talking. This led to some of some trials ending faster than most trials. One limitation was the lack of funding. If there was more funding the way this product was designed would be fundamentally different as it would have used items that cost well over 200\$. The results of this experiment can not be generalized to all microphones as each microphone has a different range depending on factors such as size and price. The producers of this experiment can be improved by making sure there is no noise in the hallway while testing the microphone. One way to improve the project is to program is to extract a projector from the vufine display and attach to a pi 0. This would make the product more contained as the whole system involves on just the pi 0. as of right now this products involves an esp32(Arduino board and android phone)