**Smart gloves 1.0: Awaaz Ek Uphaar- Gift Of Voice To The Mute**

A device to assist deaf and dumb people to express their thoughts by converting sign language to text and speech.

**Problem statement:**

* Though dumb people may use sign language, they find difficulty in communicating with others who don’t understand sign language thus causing a barrier between the two and a big cause of frustration.
* Although many sign languages for various dialects exist it always requires either a translator or both the parties to know the particular language. The speech and hearing impaired community has restrictions on communication.
* Mass communication seems impossible, as majority of people do not know the sign language.
* Majority of deaf and dumb in India are not familiar with the sign language

**Therefore it has become a vital need for the society to develop effective sign language recognition systems.**

**Aim:** To convert sign language to text and speech using an android phone

**Objective:** To lower the barrier in communication by opening up conversations between signers and speakers

**Scientific principle:** Using Flex Sensors, Arduino Uno, HC -05: Bluetooth and a Mobile Device as the hardware and Arduino IDE and MIT App Inventor as the software, normal driving gloves have been converted into wireless data smart gloves by fitting them with flex sensors along the length of each finger and the thumb and accelero sensor. The signals are passed on Arduino Uno which converts analog signal from the sensors to digital signals. The signal is then passed on to a Bluetooth device HC-05.Then signal is transmitted to a mobile device on a Bluetooth app. Signal is then converted into a voice message.

The

**Benefits:**

* Low Cost Solution, hence affordable to common people.
* More adaptable to daily lives of people
* Portable
* GPS location ability by sending message when in trouble
* Ability to customize signs and messages helps deaf and dumb who are not familiar with sign language to communicate.
* Ability to achieve text and speech for 80 gestures.

**Honours:**

* **National Winner of** **‘Ideate for India – Creative Solutions Using Technology’** , national challenge by National eGovernance Division, Ministry of Electronics and Information Technology, Government of India and Intel India

<https://www.meity.gov.in/writereaddata/files/ideate_for_india_final_results.pdf>

* Felicitated by the Honourable Minister for Electronics & IT, Communications and Law & Justice, Shri Ravi Shankar Prasad.
* Attended a National bootcamp of the Northzone in May 2019 to refine my prototype.

<https://negd.gov.in/sites/default/files/IdeateforIndia-NorthZoneResults.pdf>

* Research article, **“Gift of Voice to Mute: Hand gestures Converted to Text and Voice”** published in International Journal of Computer Sciences and Engineering in April 2020.

<https://www.ijcseonline.org/full_paper_view.php?paper_id=5076>

**Smart gloves 2.0: Swar: Smart gloves for Mute to convert sign to text and voice.**

**Problem statement:**

Since sign language is still not regarded as an official language in India, teaching is mainly through oralism. Most hearing and speech impaired students drop out of school early because they are unable to convey their thoughts to the teachers who are not conversant with sign language.

Even if they are able to acquire vocational skills, employment is a challenge for them because of the communication barrier with speakers who are also unable to understand sign language.

**Improvement in previous prototype:**

* No of flex sensors was increased to achieve more than 5000 customizable gestures, language option was given in the refined prototype.
* User testing accomplished

**Honours:**

1. National Winner and Top 20 of the ATL Tinkering Marathon 2019, an initiative of NITI Aayog’s Atal Innovation Mission.
2. Attended the mentoring session for SIP 3.0 by AIC-CCMB and further refined my prototype.

<https://www.facebook.com/177211549596806/posts/hearty-congratulations-to-two-teams-who-were-mentored-by-aic-ccmb-under-the-sip-/694029444581678/>

1. I have now been selected to attend SEP 3.0 to transform my prototype into fully functional marketable product.
2. Selected in the top 200 of Children’s Innovation Festival 2020, GUSEC &UNICEF. I attended its boot camp in January 2021 to understand fundamentals of innovation, startup, and design fundamentals.
3. Shortlisted in the top maker teams at Asia’s Biggest Maker Gathering- Maker mela 2021 and was exclusively showcased on Maker Mela platform among the 100+ projects. I attended the Asia’s Biggest Maker Gathering- Maker Mela on 23rd and 24th January 2021.

<https://makermela.com/maker/id/176>

1. Granted a **provisional Indian patent** on 5th April 2021 for the smart gloves.