SIG (Special Interest Group) – Communication Disability

SIG is a pre-standardization process through which like minded experts come together and work towards a self defined goal.

- Formed in August 2014
- 14 Members (Academic, Industry, Service Providers, User Community & Research)

- Charter is to identify technological requirements, gaps in standards & create knowledge pool through student/professional projects helping disabled community
Communication Disorders

- An impairment in the ability to receive, send, process, and comprehend concepts or verbal, nonverbal and graphic symbol systems.

- A communication disorder may be evident in the processes of hearing, language, and/or speech.

- A communication disorder may range in severity from mild to profound.

- It may be developmental or acquired.

- Individuals may demonstrate one or any combination of the three aspects of communication disorders.

- A communication disorder may result in a primary disability or it may be secondary to other disabilities.

Source: ASHA
SIG Mission Statement

e-Nabbling *Ability* in Dis*Ability*
Through Standards & Technology

*Current Focus: Speech & Hearing, Visually Challenged, Autism*
Achievements of the SIG

- Analyzed all the available technology for Speech & Hearing disabled community and identified gaps
  - *Pure Tone Audiometry, Oto Acoustic Emissions, ABR, etc*
  - *Sound proof chambers for testing*
  - *Rehabilitation post Cochlear Implant Surgery*
  - *Speech rehabilitation for stuttering, cleft lips, etc*

- Conducted 1st workshop on “Enabling Ability in Disability through Standards & Technology” in July 2015
  - 10 project proposals selected, 3 prototypes awarded
  - 75 delegates participated
Disability Workshop
Innovations that were rewarded

SPEAK-IT Glove
Innovations that were awarded

“Audiometer” Mannequin

Kid’s Toy for Rehab
Achievements of the SIG

- Approval for the Project Authorization Request (PAR)
  
  “Pre-Screening Audiometry Systems (P2650)”

  Technical Sponsor:

  IEEE Engineering in Medicine and Biology (EMB) Society Standards Committee

- SignBee 2015
  - World’s 1st Ever Sign Language Contest for ‘Normal’ School Children
Formation of P2650 WG

Develop an IEEE Standard For Enabling Mobile Device Platforms To Be Used As Pre-Screening Audiometric Systems
IEEE P2650 – WG Profile

- 60% SMEs
- 20% Practicing audiologists
- Rest in R&D and Regulatory domains
IEEE P2650 – WG Profile

Over 50 people in the WG representing 18 countries!
Current Focus of P2650 WG
Conventional Audiometry

- Pure Tone Audiometry (PTA)
- Oto Acoustic Emissions (OAE)
- Auditory Brainstem Response (ABR)
IoT Devices: Mobile Penetration

Mobile Phone Penetration in Rural Areas is increasing!!
IoT Devices

©iHear

©uHear

©sohum labs
IoT for PreScreening Audiometry

SCREENING

PRE-SCREENING

UNMET NEED
IEEE P2650 – The Steps

➢ Identify technologies that can be used for Pre-screening
  ➢ Headphone (low cost, noise cancellation, etc)
  ➢ Mobile/Wearables (low cost, open platforms, Apps, etc)
  ➢ Database (cloud infrastructure, interoperability, patient management, etc)

➢ Identify validation studies that can be used for Pre-screening
  ➢ Localization aspects (syllable test, speech-in-noise tests, etc)
  ➢ Acceptance criteria and overlap with diagnostic tests

➢ Identify standards that can be used for Pre-screening
  ➢ Existing standards that can be leveraged upon
IEEE P2650 - Timeline

WG Process
Jan’16 : Formation
Feb’16: Kick-off
Bi-Monthly Meetings

Draft Standard
Jan'20 : Technical Draft ready

Clinical Validation
Current Stage
End by Jun 2021
MILESTONES

2016 - 2019

Identified Technologies that can be used for Pre-screening
- Headphone (low cost, noise cancellation, etc)
- Mobile/Wearables (low cost, open platforms, Apps, etc)
- Database (cloud infrastructure, interoperability, patient mgmmt, etc)
- Identify validation studies that can be used for Pre-screening
- Localization aspects (syllable test, speech-in-noise tests, etc)

Acceptance criteria and overlap with Current Diagnostic tests

Identify standards that can be used for Pre-screening & Existing standards that can be leveraged upon (ex: IEEE 11073 series)

Draft Standard Version 1.7 Ready for Validation
https://ieee-sa.imeetcentral.com/p/aQAAAAAD4ASl
MILESTONES
(Extended PAR period)

2020 -

Validation of Android based Hearing Test Applications (Apps)
Clinical Study is being undertaken to compare the outcomes in a controlled environment that is typical of camp set up and controlled degree of simulated hearing loss in 4-5 centres – this will help refine the calibration thresholds described in the DRAFT standard

Status:
➢ Ethical and technical clearance obtained, Consent forms for students and patients obtained
➢ Proposal for project funding has been submitted to IEEE
➢ Study could not start off as per the project plan as participating academic institutes were temporarily closed in the wake of Covid-19 pandemic
➢ There is still uncertainty prevailing with regard to the reopening of academic institutes
➢ Plan for next course of action during a WG meeting in the mid-September
Validation Study Details

Participating Institutions
1. Dr. SRCISH, Bangalore - Lead
2. NISH, Trivandrum
3. KMC, Manipal
4. MAHE, Manipal
5. AIISH, Mysore

Open to add more Institutions – either within India or Outside

More details: https://ieee-sa.imeetcentral.com/psas/folder/all/WzIsNzE1Mjk0ODVd/

Status:
➢ Ethical and technical clearance obtained from most of the Institutions
➢ Project to be done in 3 Phases as soon as Institutions open up post-COVID (expected Oct’2020)
P2650 enabled scenarios

uHear

With uHear, identify a potential hearing loss through three assessments: Hearing Sensitivity, Speech in Noise, and a Questionnaire about common listening situations.

uHear also offers a 'Locate' function to help find the nearest hearing healthcare professional for a full follow-up.

uHear is available for download to the iPhone and iPod touch

Download from iTunes
Thank You