EMPOWER 2019

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- Session: Interventions for Learning Disabilities
- Session: Assisting Employability of Persons with Disabilities
- Session: Design Challenge for Students
- Session: Experience Zone
- Plenary Session: Innovation Ecosystem in the AT Sector

17th October

- Keynote: The Balance between AI and Human Expertise in the Future of Technology for People with Disabilities, Helen Petrie, University of York, UK
- Keynote: From Assistive Technology to Universal Design: a view from DAISY community, Hiroshi Kavamura, Daisy Consortium
- Session: Assistive Technology for Mobility: Principles and Practices in India - P1
- Session: Accessible Digital Content
- Plenary Session: Closing Ceremony (Discussions & Vote of Thanks)

14th October - Workshops

Speaker: Volker Sorge, University of Birmingham, UK

Workshop W1A, Preparing Accessible Math Documents using MathJax v3

Providing accessible teaching material for Mathematics is still often considered a challenging task in higher education. However, there actually exists a number of mature tools for the automatic transformation of math documents into web-accessible content. The aim of this workshop is to instruct on creating accessible math content from a variety of sources using exclusively freely available open source tools. We concentrate on the generation of alternative document formats including speech and Braille suitable for web and ePubs. And we teach how to use assistive technology with the new MathJax version 3 library.
This workshop is aimed to be hands on, and we expect participants to work along and experiment with the tools we introduce. The main topics we will concentrate on thereby are:

- How to automatically convert common input formats (LaTeX, Word, and Markdown) into alternative output formats containing Speech and Braille, in bulk rather than expression by expression.
- How MathJax's assistive technology extension can be employed to support students with visual impairments and dyslexia in accessing mathematical formulas including support for synchronized speech, Braille output and highlighting.
- How to tailor accessible content to individual needs by varying speech output and providing specialisation by subject areas like physics or computer science.

Workshop W2A, Accessible STEM Diagrams

Diagrams are an intrinsic part of STEM education that are notoriously difficult to make accessible for readers with visual impairments. For example, molecular diagrams in Chemistry, circuit or force diagrams in Physics or sketches in Geometry convey a lot of information using only a few strokes. While this is an important learning tool for sighted students, providing a similar informative means to students with visual impairments is very challenging. Moreover, for educational purposes it is often not enough to only support passive consumption of diagrams, but it is also necessary to allow learners the active creation of diagrams to express their ideas and demonstrate understanding of the subject.

In this session we will give an overview of some common techniques how to create and work with accessible diagrams. We will in particular teach how to work with diagrams that are accessible using modern web and ePub technologies, using diagrams commonly used in Chemistry and Statistics as examples. We will also present means of creating STEM diagrams and data visualisations suitable for visually impaired learners and aim to stimulate a discussion on the needs and shortcomings that exist in this area.

Speaker: Subhash Vashishth, Svayam

Workshop W1B, Workshop on Disability Equity & Physical Accessibility

The workshop aims to orient participants about understanding disability in social context, disability equity and etiquettes, right terminologies to use, what is accessibility, the legal and policy framework & how can we make our environment physically accessible and safe. The workshop will see Role plays, orientation short films, experience sharing and interaction with the participants to bring home the concepts on inclusion and inclusive practices.

Speaker: Nekram Upadhyay, Indian Spinal Injuries Center

Workshop W2B, Mobility and Accessibility for people with locomotor disabilities

Generally, those who need mobility devices do not have any idea where to go for a wheelchair assessment. Most of them buy from local market or online without any trial and fitting. Wheelchair user and their care-givers or family members visit to a doctor or therapist to ask for their mobility solutions but most of them are not specialized in wheelchair and seating services. There are various government schemes through which users get wheelchairs and tricycles for free but those wheelchairs are not customized as per the requirement of the user.

For selection of an appropriate wheelchair there are many factors to consider. For example, what are the current health concerns, including past medical history, progressive nature of the disease process, recent or upcoming surgeries, postural deterioration from the last seating evaluation, and history of wounds? Other considerations include the patient’s lifestyle.

As per the World Health Organization, in developing countries less than 10% of people who require a wheelchair have access to one.

In this workshop the participants will be able to learn, how to prescribe (select) a wheelchair through a detailed assessment; how to take the most important body measurements to help select the correct size wheelchair for a wheelchair user; benefits of appropriate posture in wheelchair; how to record the presence, risk of or history of pressure sores for a wheelchair user; how to select an appropriate cushion and other postural supports; about the local market; government schemes and policies; learn about environmental barriers and accessibility standards.

Speaker: Boguslaw Marek, Hungry Fingers

Workshop W1C, Empowering young learners with congenital blindness through tactile graphics. Part 1: The role of tactile graphics in effective education for all

Although few people would question the importance of tactile graphics in education of learners with a visual impairment, preparation of totally, blind learners for a meaningful, effective and confident use of raised drawings, diagrams and maps does not keep pace with the growing availability and emergence of new technologies for producing high quality raised graphics.

Without acquiring necessary skills and without good understanding of a wide range of concepts based on spatial relations blind learners may be confronted with faultless, professionally produced images which are too difficult to understand.

The workshop is intended to acquaint participants with a range of resources facilitating introduction and understanding of tactile diagrams on the assumption that the existing guidelines for a professional design of raised graphics must be supplemented by a set of guidelines for introducing tactile drawings and diagrams. Taking the roles of students with a visual impairment participants will move step-by-step through a course in introducing tactile diagrams and will identify and try out skills needed for recognition and production of tactile lines, simple and 3-D geometric shapes, the relation between objects and drawings, configurations of objects, drawings of objects which are too small or too large for tactual explorations, and drawings of grids and maps. A proposal of a set of guidelines for introducing congenitally blind learners to the world of graphics and a joint look at possible benefits which the “special needs” resources and learners with a visual impairment can bring for teachers and all students will conclude this part of the workshop.

Workshop W2C Empowering young learners with congenital blindness through tactile graphics, Part 2: How technology can help understand tactile graphics and how tactile graphics can help understand technology

In this part of the workshop several devices, software and applications are introduced which can enrich the range of resources which can facilitate inclusive education and make education more entertaining for all students and more effective. Talking pen, talking tactile tablet, software for learners with communication problems and game-type applications for developing computer skills or introducing children to coding will be presented. Presentation of theses devices is consistent with the author’s belief that students who are blind or have low vision can become excellent programmers. However, the educational resources and programs needed to build these skills often have very limited levels of accessibility and/or usability for young students with

vision impairment. The workshop will discuss accessibility problems and opportunities offered by some of the available coding programs. and projects. A series of accessible game applications which help young students with vision impairment to develop conceptual and digital skills required for coding will be presented. These accessible applications allow both blind and sighted learners to work together. Tactile diagrams which accompany these applications were developed to help totally blind learners understand what happens behind developed for these applications were designed to help totally blind learners understand what happens behind all those flicks, drags and double taps used in the games.

15th October

Inaugration Ceremony

Keynote: Luc de Witte, Centre for Assistive Technology and Connected Healthcare, University of Sheffield UK

Session: Augmentative and Alternative Communication

Organizer: Akila Surendran, NISH

- **Invited Talk - Enabling technologies for Autism: Current and Future perspectives, Akila Vaidyanathan, Amaze Charitable Trust -** Persons who are affected by the Autism Spectrum Disorder have core deficits in the areas of communication, speech, language, social skills and behavior. Low level of awareness, scarcity of trained professionals and high cost of therapies limit the access to appropriate Interventions for children with ASD in India. More than half of the persons with ASD may not develop speech and language and communication beyond a functional level. Even those who develop speech and communication often find it difficult to navigate the mainstream world independently.
  Assistive technology [AT] and Alternate or Augmented Communication [AAC] tools help to develop and enhance functional skills for persons with ASD as well as equip them to communicate. A large range of tools ranging from adaptations on the PC/Laptop like Adaptive mouse and keyboards , Touch screen monitors , Apps on Tablets like the IPAD , and Alternate systems of Communication like Picture Exchange Communication System [PECS] PECS and Voice output Communication devices[VOCA] are available .There are also specific tools like Clicker 6 for literacy and Earobics for Auditory training .
  This presentation will discuss the various AT and AAC tools which are used in the current scenario, including some simple low tech solutions to high tech apps and software and highlight how these tools help the person with Autism alleviate their core difficulties.
  Some future perspectives of what kind of solutions are needed and possible based on the advancement of technology and areas where apps can be developed especially in the Indian context will be discussed
- **Invited Talk - Empowering parents to help their child to communicate - our experiences in product design, development and training -** Children and adults with complex communication needs, require Augmentative and Alternative Communication (AAC) tools to express their needs, wants, thoughts, feelings, etc. One such tool is Avaz app - from Invention Labs - a high-tech AAC tool that is available as an app for iPad and Android devices and phones. Despite being the first commercially available AAC app in India, launched in 2010, the app did not have many takers initially in India. Our analysis

of the market and users led us to believe that the gap is in the utter paucity of speech therapists in India and awareness of parents. Based on these findings, we moved towards bridging the gap between the product and the parents - the main users of the app - by empowering them on various fronts.

- **Invited Talk - Technology for persons with multiple disabilities, Arun Mehta, BAPSI -** While considerable progress has been made in the use of technology to help persons with a single disability such as blindness or deafness, those with multiple disabilities still continue to fall between the cracks. Even communication with the people around is a challenge, making it that much harder for persons with multiple disabilities to organize and demand their rights. In many cases special hardware is needed, which is expensive and hard to maintain. This presentation touches on the huge challenges and opportunities technology presents to those with cognitive disabilities, and describes recent developments in the deafblindness space.
- **Invited Talk - Implementing the rights based approach in designing technology, Jeeja Ghosh** - With the rapid increase of sexual and gender based violence against women IT companies are also exploring and developing mobile based apps to facilitate the reporting of sexual abuse. Women constitute a vulnerable population within the realm of violence and harassment is concerned. One section of women are rarely included namely girls and women with disabilities. There are a multi layered reasons behind this. The conception that women with disabilities are largely asexual denies their status as a prospective user. The heterogeneous nature of disability and the varied needs of different impairment group also make it difficult to address under one umbrella app.

  Within the sphere of disability, women with little or no speech, in other words those who cannot rely on spoken language to make their wants and needs known, are particularly vulnerable. They are voiceless and invisible in society. They are in the “other box”. Perpetrators see women with communication disabilities as defenseless, unable to call for help and incapable of fighting back. Their communication disability also makes it extremely difficult to tell about their victimization, and if they do tell, they are less likely to be believed. There is also the perception that they are unable to testify in court and hence police often do not even attempt to take their statements. Perpetrators recognize and capitalize on this vulnerability and have little or no fear for the consequences of their acts. After all, a silent victim is the perfect victim.

  This paper is an aim to sensitize and orient IT professional and IT students to engage in developing assistive devices to augment the communication of those who are not in a position to express themselves through speech. The paper talks about the importance of rights based approach while developing the communication support systems. The process of user involvement in developing the assistive devices is the key mantra in a rights based approach. Keeping in mind the slogan “Nothing about us without us” women with disabilities are to be involved in the entire process. This approach is effective to design a device which is use-able and accessible to women with diverse physical and cognitive abilities.

- **Paper Presentation - Do-It-Yourself Head-Controlled Mouse: An Affordable Assistive Technology Solution for People with Severe Motor Disabilities**
- **Poster Presentation - Importance of Sign Language Recognition in the Education of Hearing Impaired Students**

Session: New Horizons: Harnessing AI/ML driven Intelligent Physical Systems for the Assistive Technology Sector

Organizers: Rohan Paul, IIT-D & Charudatta Jadhav, TCS

Abstract: Recent leaps in computational pattern recognition, NLP, sensors and intelligent embedded and robotic systems are ushering in a new era. These developments have the potential to create new possibilities for persons with special needs in terms of increasing access, independence and promoting social integration. Some examples include intelligent wheelchairs, brain machine interfaces, intelligent IoT devices, conversational agents, intelligent communication & social interaction aids, aids for cognitive impairment, scene understanding and navigation systems etc. This cross-disciplinary and pan-disability aims to bring together end users and researchers to evaluate current evidence and brainstorm new possibilities, particularly in the Indian context.

- **Invited Talk - Intelligent Cane via ML on Tiny Edge, Prateek Jain, Microsoft Research -** People using white canes for navigation face challenges concurrently accessing other devices, e.g., smartphones. Building on recent research on abandonment of specialized devices, we explore a new touch free mode of interaction, wherein a person with visual impairment performs gestures on their existing white cane to trigger tasks on their smartphone. We present an easy-to-integrate GesturePod, that clips on to any white cane and enables the detection of gestures performed with the cane. GesturePod, thereby, helps manage a smartphone without touch, or removing the phone from a pocket or bag. In this talk, I will discuss design decisions and challenges in building the pod which is powered by a novel, efficient machine learning pipeline that can run on edge devices. (Joint work with Shishir Patil, Don Dennis, Chirag Pabbaraju, NadeemShaheer, Harsha Simhadri, Vivek Seshadri, and Manik Varma)
- **Invited Talk - @Home Digital AR+AI based Screening for Persons with Disabilities: An exploration, Suresh Munuswamy, Public Health Foundation of India -** My lab works on the concept of “One step forward for better health, digitally”, which philosophically means (as what we are suggesting is not yet practical): if we can extend primary care service from present health facility delivery model to a person’s home delivery model; we opine that we can achieve universal coverage and possibly provide a more comprehensive, coordinated, convergent and convenient service.
  For a person with disability, “One step forward for better health, digitally” can mean, possible home delivery model for services like: identifying the type, level of disability, providing the necessary assistive support to carry on with the activities of daily living, access to further management and benefits, with due consideration to the ecosystem. Obviously there are several challenges…location, language and local skills being the

key, in our opinion. With augmented reality (AR) and graphic design (GD) we have developed
language neutral concepts for disability screening. With artificial intelligence (AI) we are working on developing person, location and ecosystem specific disability management. By combining both, we are hoping to provide comprehensive, coordinated, convergent and convenient primary health care service for persons with disability.

- **Invited Talk - TBD - C V Jawahar, IIIT-H**
- **Invited Talk - Determine Accessibility from Needs and Preferences, Gerhard Weber, Technical University -** People with a disability often have unique needs and preferences when it comes to use a mobile phone, a laptop, or a TV. Changing setting in the device and for using assisted technology can be cumbersome and may create unexpected results. Project Cloud4All has created an infrastructure for calculating settings and activating proper AT on Android, Windows and Linus devices. In this talk we report about the matchmaking process we developed. Based on ontologies describing the operating system, the application settings, the assistive technology and the user needs, a rule-based approach can infer if there is one, none or multiple settings possible. Evaluation with experts show the results are comparable.
- **Poster Presentation - ViShruti: Seeing Through Listening, Sanchit Aggarwal et. al**

Session: AT for speech and hearing impairment

Organizer: Akila S., NISH

- **Invited Talk - Speech-input Speech-output Communication aid (SISOCA) for speakers with dysarthria, P. Vijayalakshmi, SSN College of Engg** - Dysarthria is a neurological speech disorder caused due to cerebral palsy or stroke. This causes the speech motor control system to become weak, causing slow or uncoordinated articulatory movement, resulting in unintelligible speech. The impairment may confine them from communicating to the outside world irrespective of their potential. As speech is the natural way of communication and as the disorder is progressive, a speech-enabled assistive device to aid communication between dysarthric speakers and their normal counterpart will be an appropriate solution. Development of a speech-enabled assistive device for dysarthric speakers includes, identifying speaker-specific articulatory errors through speech assessment, building speaker-dependent speech recognition system, correcting articulatory and acoustic modeling errors in the text-level and resynthesizing the corrected text into more intelligible speech. As a prototype, SISOCA, as a communication aid, is developed for 20 dysarthric speakers.

- **Invited Talk - Assistive Technology - Gaps & Challenges; A family Perspective, Snigdha Sarkar, Anwesha Kolkata**

- **Invited Talk - Seeking Solutions to the Challenges of Sign Language Grammar for Technology, Vishwajit Nair and Andesha Mangla, Indian Sign Language Research and Training Centre -**
  In recent years, there have been many attempts to develop technology to translate Indian Sign Language into speech/text and vice versa. However, most attempts fail to acknowledge the fact that ISL has a grammar and that this grammar is of a visual-spatial nature which creates complexities in translation.
  Our presentation will first focus on some key features of sign languages that need to be taken into consideration when developing translation software. The first feature we will discuss is non-manual expressions like facial expressions, role shift, eye gaze, etc. Such non-manual expressions are produced using the face and upper part of the body and are crucial to create lexical and grammatical meaning. The second feature is the use of space to express various types of grammatical structures like localization and indexing, verb agreement, verb aspects, etc. The use of space implies that the direction in which the hands move can create changes in grammatical meaning. Another intricate feature of sign languages is iconicity which results in grammatical structures like incorporation, classifiers, etc. The fourth feature that we will discuss is simultaneous signing in which two semantic propositions can be expressed simultaneously.
  Secondly, our presentation will put forth some problems that deaf people face in their daily lives for discussion of possible solutions.
- **Poster Presentation - Dhwani: An Integrated Hearing Aid Device to Provide Therapy, Kavyashree Venkatesh et. al.**
- **Poster Presentation - A Novel Practical Approach for Teaching Electronics for UG & PG Hearing Impaired Students, Dr. SRN Reddy, B.S Tripathi, Rachit Thukral, Manasi Mishra, IGDTUW**

Session: Learning Tools & Education for the VI

- **Paper Presentation - Learning Languages with Assistance, Anil Prabhakar**
- **Paper Presentation - The impact of refreshable braille displays on the education of students who are blind, Venkatesh Chari et. al.**
- **Invited Talk - Bonny Dave, Akshita Sachdeva, Trestle Labs. Kibo - Inclusive Reading and Learning -** Braille and Audio Books based teaching-learning has been at the core of a visually-impaired child's education. Various reading-learning resources still remain inaccessible for them, as they are dependent on others to create content in Braille and Audio. With the use of ICT tools and techniques, Kibo is enabling real-time access to printed, handwritten and digital content to make learning inclusive for them and also reducing the dependency on others. Thereby enhancing the quality of education, access to resources and an overall socio-economic growth with increased workplace productivity
- **Poster Presentation - Learning through Play: Designing a Game-Based Curriculum to Teach Numeracy Skills**

- **Poster Presentation - Smart NotePad - One Stop Device for Making Learning Accessible for the Blind, Hunny Bhagchandani et.al**
- **Poster Presentation - HEXIS: Braille Book Reader for visually impaired school children, N. Rajagopal et. al.**
- **Poster Presentation - Efforts to make IIT Kanpur campus Inclusive, Anubha Goel**
- **Poster Presentation - Role of Modern Assistive Technology in Inclusive Education for the Visually Impaired, Bharat Vaya et. al.**

Chess Competition

Organizer: AICFB

- 11:00 AM - 1:00 PM Chess competition - Round 1 (4 Boards)
- 1:30 PM - 3:30 PM Chess competition - Round 2 (4 Boards)
- 3:30 PM - 4:00 PM Demonstration of TCS accessible chess learning tools

Experience Zone

Organizer: Experience Zone: STEMPOWER, XRCVC, and others

Vision Empower is a not-for-profit enterprise which aims to make STEM education more inclusive for students and teachers with visual impairment. We also work on technology research on specific low cost solutions which can benefit this community. To achieve our mission, we engage with schools, partner NGOs, technology research labs and firms working on assistive technology. At Empower 2019, we would like to curate an Experience Zone along with our partners, to first highlight the gaps/ challenges faced in pursuing STEM education and demonstrate the work that all of us are engaged in, to create solutions that can address the gaps. Along with technology solutions for various affordability ranges, we would like to present the processes in development of pedagogy and the ground level changes that can be brought about to empower students interested in STEM education. This session is intended to inspire the students, teachers, technology designers and policy makers by showcasing the collaborative eco-system and Open Innovation required in addressing the grand challenge. Collaborators in this session are listed below but not limited to Assistech, IIT Delhi, Enability Foundation, I- Stem, Matruchhaya, Mitrajyothi, Raised Lines Foundation, Saksham, Touche' tech, Vision Empower, XRCVC

Plenary Session: Panel - Investors in the AT sector - Social Alpha, BIRAC, Vilgrow, Wellcome Trust, Microsoft

Chair: Mamta Kohli (DFID)

16th October

Keynote: Empowering for Inclusion, Sriram Rajamani, Microsoft

Abstract - Over 1 Billion people in the world have some form of disability, and conservative estimates in India are at least 3 crores. Technology can play a huge role in empowering people with disabilities. In this talk, I will talk about design of such technologies from Microsoft in general, and our research lab (Microsoft Research) in particular. I will also talk about opportunities to collaborate with our lab in designing, evaluating and deploying technologies for inclusion.

Session: Assistive Technologies for the Global South: Opportunities and Challenges

Organizer: Manohar Swaminathan, Microsoft Research

This session will bring together scholars in disability studies with focus on the global south and academics and researchers working to create assistive technologies to understand the unique challenges that are faced by people with disabilities in the global south. The session will have invited talks, and a moderated panel discussion.

- **Invited Talk - Anita Ghai, Ambedkar University - Introduction to the disability studies in the global south and perspectives on Assistive Technology**
- **Paper Presentation - Music, Storytelling and Play: Teaching Computation Thinking to Blind or Low Vision Children in India**
- **Panel Discussion - Nidhi Goyal, Prateek Madhav, Jeeja Ghosh, Akila S. - Moderator - Manohar Swaminathan**

Session: Spatial Accessibility for VI

- **Invited Talk - Piyush Chanana, AssisTech - Enabling Independent Travel for Persons with Blindness: Perspectives & Approaches**
- **Invited Talk - Vikas Upadhyay, AssisTech - Enoucnter Challenges in Accessible Digital Map for Indoor**
- **Paper Presentation - CycloStroll: An Immersive Exploration of Neighborhood via Spatial Audio, Aryan Saini et.al.**
- **Paper Presentation - Inclusive Indoor Navigation, Charudatta Jadhav et. al.**
- **Poster Presentation - Seeing For The Blind – A Cost-Effective Handsfree Navigational Solution, Anantha**

Plenary Session: Lemontree Initiatives in Employment of Differently Abled - Aradhana Lal, Lemon Tree

Session: Bridging the Gap: Taking AT solutions from the Lab to the Field and Bringing Field Experience to the Lab

Organizer: Piyush Chanana, IIT-D

This session addresses the challenges of translating solutions from the lab to the field. Topics of interest include: community engagement for need finding, evaluation/validation of assistive technology solutions, challenges of scaling up training, provisioning and access, creating market access, interfacing with Govt. The session would intend to showcase case studies and examples and consolidate guidelines and best practices as well as scientific tools for conducting formal studies.

- **Invited Talk - Sohum: a novel deafness screening device for low resource setting - the journey from lab to community, Nitin Sisodia, Sohum Innovation Lab**
- **Invited Talk - Sugamya Pustakalya- from small audio book libraries to a nationwide repository of accessible books, Charudatta Jadhav, TCS**
- **Invited Talk - Customizing AT solutions for education (Screen readers, DAISY players, in Indian Languages: Partnering with Industry for mainstream scale up, Dipendra Manocha, Daisy Consortium**
- **Invited Talk - Assistive Technology to improve the quality of living of Women & Girls with Disabilities - Kuhu Das, Association for Women with Disabilities -** 1. How the Assistive Technology can help improve the quality & standard of Assistive devices to be more appropriate and within affordable cost and how AT can be reached to the women & Girls with Disabilities living in rural, hilly & forest areas. 2. Gender appropriate AT (AT through gender lens) - how AT can help Assistive devices to be more user friendly - appropriate for Women & Girls with disabilities - the design, the comfort, the weight 3. How AT can improve making Assistive devices useful /suitable & appropriate for rural, hilly and forest areas and WWDs /PWDs – how and whether AT can help developing Livelihood appropriate Assistive devices to help Women with Disabilities to be engaged in different kinds of livelihood – farming, construction work, machine work, long sitting activities etc.

Session: Interventions for Learning Disabilities

Organizer: Manijra Sinha, IIT-Kgp

The aim of this session is to provide a general understanding and different perspective of learning disabilities such as dyslexia, and Autism. The goal is to further develop an awareness of the behavioural characteristics, social and technical logistics involved of working with students with Dyslexia and Autism, as well as an understanding of assessment practices, and learning styles of students with learning disabilities.

- **Invited Talk - Sanskruti Shah, Madras Dyslexia Association. Educational Interventions in Children with Dyslexia -** Madras Dyslexia Association (MDA), instituted in 1992, has been working in a not-for-profit mode towards creating a “Dyslexia Sensitive” society in a multi-pronged manner. It works with all the stakeholders to identify and provide support to dyslexics from pre-primary stage through adulthood. Many a child with Specific Learning Difficulty (SLD) has gone unattended in the “golden years" of primary classes. This impacts not just the academics but also their social well-being. While the academic gap continues to widen, the child’s self-esteem slides down steeply. They also run the risk of turning into social delinquents. In addition to providing full-time and part-time remediation to primary school children who are assessed to have a specific learning difficulty, MDA works closely with schools to help setup Resource rooms to help children with dyslexia within the comforts of the school itself. Timely identification and providing remedial strategies within the classroom is not just a “band aid”; it is scaffolding that helps the child optimize his or her academic potential. “Early intervention in classrooms is the ideal solution”-to enable this, the mainstream teachers are trained to provide strategies for reading, writing, spelling and mathematics within the classroom. In yet another innovative initiative MDA has leveraged technology to provide on-demand support to a struggling reader through the use MDA Avaz reader-an assistive reading app. Currently MDA is collaborating with the Government of Tamil Nadu to sensitise and train teachers in all the districts of the state to equip them to identify and help children with dyslexia.
- **Invited Talk - Arpita Bhattacharya, Pradip Centre for Autism Management. The Unique Learning Style on the Spectrum -** Among the types of mental disabilities, ‘Autism’ is one of the most challenging form considering its severity and prognosis. Academic intervention in ASD has always been highly challenging not because of the factor that they do not understand concepts but because of their unique learning styles and difficulty in grabbing abstract concepts. They are primarily visual learners with lack of generalisation skills. Some having the issues of over-selectivity or under-selectivity while perceiving stimulus. Children on the spectrum are usually good with spellings. The high functioning group tend to be hyperlexic at times though the comprehension can be at literal level. Visual memory and form perception are their usual strengths. The presentation includes some of the strategies used in academic intervention for children with ASD like cognitive mapping, phonic drills, number games, attention enhancing tasks, cancellation tasks etc.
- **Invited Talk - Indrani Basu, Action for Autism. Educational Interventions in Autism Spectrum Conditions -** It is often said that ‘If a child cannot learn the way we teach, maybe we should teach the way they learn.’ This is especially valid when addressing the

educational needs of people with Autism. Autism is a neurodevelopmental condition that primarily affects communication and social understanding in individuals. Given their different neurobiology, people with Autism Spectrum Conditions experience the world in a manner that is different from the non-autistic, and one that results in a unique learning style. Any successful educational strategy for students with autism will have to look beyond the purely academic and focus on the learning of social skills and communication, address their sensory challenges, as well as provide for environmental and other accommodations that promote learning and independence. This presentation will talk about some of these components necessary for effective educational intervention for students with autism.

- **Paper Presentation - VHAB - The Assistive Ecosystem for a Special Need, Robin Tommy et. al.**
- **Poster Presentation - Improving the Readability of Dyslexic Learners with Mobile Game-based Sight-word Training**

Session: Assisting Employability of Persons with Disabilities

- **Invited Talk - The Number One Way to Bring Empowerment, Darrel Templeton, MegaVoice -** We know the need for Empowerment to be possible is to make it accessible. I will cover the 3 most important principals of Education and the 4 Steps toward Empowered Character. And finally the 3 characteristics I believe one needs to look for in Accessible Tools.
- **Paper Presentation - CONVY - The Assistive Interactor, Eswariuma G et. al.**
- **Paper Presentation - Workplace accessibility for persons with visual impairment Challenges and solutions Dhananjay Bhole**
- **Paper Presentation - Enable Vaani - rural social network for persons with disability, Moses Chowdari Gorrepati**
- **Poster Presentation - Naveen Kumar K et al - EYE (Educate Yourself Easily) Tool – Independence through self-learning**

Session: Design Challenge for Students

Session: Experience Zone

Organizer: Saksham Trust

Plenary Session: Innovation Ecosystem in the AT Sector

Speakers:-

- Catherine Holloway, Global Disability Innovation Hub, UCL

- Prateek Madhav, ATA Labs

17th October

Keynote: The Balance between AI and Human Expertise in the Future of Technology for People with Disabilities, Helen Petrie, University of York, UK

Artificial Intelligence (AI) and recent technological developments have recently provided many innovations which enable people with disabilities to lead more independent and fulfilled lives. These range from brain-computer interfaces enabling people with severe physical disabilities to walk with an exoskeleton to personal navigation systems to guide blind people. However, we need to carefully consider what is the right balance between AI/technology and human expertise and how best to integrate these two sources of support for people with disabilities. I will consider a number of recent case studies of innovative assistive technologies for people with disabilities, looking at whether and how they have combined AI and human expertise, and whether they have the balance right. I'll also look towards the future and what developments we might expect soon.

Keynote: From Assistive Technology to Universal Design: a view from DAISY community, Hiroshi Kavamura, Daisy Consortium

Meeting specific needs is a prerequisite of an Assistive Technology. A native sign language user likes to have alternative visual expression of any meaningful sound. A blind person would like to have alternative auditory expression or text in braille of any written text. What about who are living with deafblindness, cognitive or mental disabilities? In a super ageing society like Japan, urgent development of universal design is crucial because increasing number of aged people have to live with mixture of physical, cognitive and mental disabilities with dignity. Single disability solutions sometimes have conflict among themselves. Assistive Technologies making everything visible or audible does not work for deafblind people. We have to revisit the role of Assistive Technology as a measure to enhance abilities inside of a person who has sensors, neural networks and brain functions. The social model on disabilities guides us to look at interactions between persons with specific needs and the society where they live. In addition to availability and affordability, sustainability and integrity of a specific Assistive Technology are important indicators to evaluate. Universal Design approach requires participation in all stages from design stage. monitoring, evaluation and decision making for revision. All stake holders need to have access to information and communications necessary throughout the stages. Here is the specific important role of accessible ICT. W3C has developed a good model of "open, inter-operable and non-proprietary standards" approach towards Universal Design. Linking R&D on Assistive Technology with open standards development will be the best strategic direction for R&D institutions supporting inclusive society development.

Session: Assistive Technology for Mobility: Principles and Practices in India - P1

Organizer: Nekram Upadhyay

- **Invited Talk - Universal Design Principles & Practices - Ravindra Singh, Delhi Technological University**
- **Invited Talk - Assistive Technology for Mobility and Women & Girls with Disabilities – A reality Check, Kuhu Das, Association for Women with Disabilities**
- **Paper Presentation - Analyzing Eye Gaze Fixation Patterns of Users with SSMI, Abhishek Mukhopadhyay et. al.**
- **Poster Presentation - SCKAFO - Automatic Locking and Unlocking of Orthosis, Betic Lab IIT-B**

Session: Accessible Digital Content

Organizer: Dipendra Manocha, Saksham Trust

We are running a huge risk of losing our own language knowledge and heritage due to inconsistencies in the way we are creating our own language digital content. We need policies, filling up of technology gaps and ensure usability of the content by all including persons with disabilities to provide an opportunity for Indian languages to survive and to save our enormous heritage.

- **Invited Talk - Md. Arifur Rahman, Vashkar Bhattacharjee - Digital Content Accessibility in Bangladesh** - According to the Bangladesh Bureau of Statistics, approximately four million people are visually impaired in Bangladesh. Furthermore, approximately 27% of people in Bangladesh are illiterate or low literate who are considered as print disable. Accessible information and reading materials have not been available to this group. Considering the situation, YPSA, along with Access to Information program (a2i), Prime Minister's Office by the technical support of WIPO, Accessible Books Consortium, DAISY consortium and GAATES has produced DAISY digital multimedia books, Accessible E-books, Digital Braille Books for the student of grade 1-10. Now all learners can get free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes. Also, education facilities became child, disability and gender sensitive and provide safe, inclusive and effective learning environments for all towards quality education. This article is dedicated to describe the situation of inclusive education before and after the implementation of Daisy standard for text conversion and its future possibilities in Bangladesh with case study.
- **Invited Talk - Avneesh Singh, Daisy Consortium, W3C, Standards: Prerequisite for Accessible Products and Assistive Technologies** - Digital technology has a potential to remove all the accessibility barriers for people with disabilities. But many times it itself turns into a barrier, when the developers do not follow the standards.
  The session will be centered on the following:

    - Why standards are essential for accessibility?
    - Why it is important to prevent fragmentation of standards?
    - Which international standards are important for accessibility?
    - Need of regulations for implementation of standards.
- **Paper Presentation - Multi-modal Password - Haptic Solution**
- **Poster Presentation - Smart Assistant, Eswariuma G et al.**
- **[Cancelled] Poster Presentation - Common Web Accessibility Issues of academic institutes and solutions way ahead, Dhananjay Bhole**

Plenary Session: Closing Ceremony (Discussions & Vote of Thanks)