

**RESEARCH** (Last five years)

## Projects

## a. Intramural

<b>Sl. No.</b>	<b>Title of the project</b>	<b>Name of the Investigators (PI and Co-I)</b>	<b>Sanctioning / Funding Agency</b>	<b>Funds (in Rs)</b>	<b>Status ( completed/ Ongoing)</b>
1	Development of an Automatic Speech Processing Based System for Assessment of Stuttering in Kannada Speaking Adults	PI: Dr. Ajish K Abraham & Dr. Anil Kumar Vuppalla (IIIT Hyderabad) CI: Dr. Sangeetha Mahesh	AIISH research fund	Rs. 12.67 lakhs	<b>Completed</b>
2	Modifying the design of automated Malayalam articulation test to improve accuracy for evaluation of children with severe articulatory disorder	PI: Dr. Ajish K Abraham & Dr. Leena Mary (RIT Kottayam) CI: Dr. N. Sreedevi	AIISH research fund	Rs. 9.67 lakhs	<b>Completed</b>
3	Development of Visual Scene Display (VSD) based Augmentative and Alternative Communication (AAC) system	PI: Mr. Karthik Venkat Sridaran & Dr. V. Vivek, JAIN University, Bangalore CI: Dr. Ajish K Abraham CI: Dr. Reuben Varghese	AIISH research fund	Rs. 5.40 lakhs	<b>Completed</b>
4	Development of Speech enabled Communication tool for clients with Speech Impairment in Kannada	PI: Shri. Manohar.N CI: Dr. Rajsudhakar	AIISH research fund	Rs.4.95 lakhs	<b>Completed</b>
5	Design and Development of E-Learning Platform and Faculty System	PI: Dr. Shijith Kumar C CI: Shri. Manohar.N	AIISH research fund	Rs.4.68 lakhs	<b>Completed</b>
6	Automation of Malayalam Articulation test using automatic speech recognition	PI: Dr. Ajish K Abraham & Dr. Leena Mary CI: Dr. N. Sreedevi	AIISH research fund	Rs. 6.31 lakhs	<b>Completed</b>
7	Computerized Auditory Training for Kannada speaking children with Hearing Impairment	PI: Shri. Manohar	AIISH research fund	Rs. 3.31 lakhs	<b>Completed</b>

b. Extramural

Sl. No.	Title of the project	Name of the Investigators (PI and Co-I)	Sanctioning/ Funding Agency	Fund (in Rs)	Status (completed / Ongoing)
1	Improving Communication Outcomes in Children with Cleft Palate in Rural India	PI: Dr. Ajish K Abraham PI: Dr. Nancy Scherer, PI: Dr. Visar Berisha, PI: Dr. S. R Mahadeva Prasanna, CI: Dr. M. Pushpavathi, CI: Dr. R. Gopi Sankar,	National Institute of Health (NIH), National Institute on Deafness & other Communication Disorders (NIDCD), USA	849,861 USD	Ongoing
2	ARTICULATE+ : A system for automated assessment and rehabilitation of persons with articulation disorders”.	PI: Dr. Ajish K Abraham CI: Dr. M. Pushpavathi & Dr. N. Sreedevi	IMPRINT, Ministry of Education and ICMR	Rs. 137.498 lakhs	Completed
3	Development and Validation of RoAS (Robot for Articulatory Simulation)	PI: Dr. Ajish K Abraham CI: Dr. N. Swapna & Shri. N. Manohar	SERB, DST	Rs.32,27,309 /-	Completed
4	“NASOSPEECH: Development of Diagnostic system for Severity Assessment of the Disordered Speech”	PI: Dr. Ajish K Abraham CI: Dr. M. Pushpavathi & Dr. H. S. Sathish	DBT	Rs. 59.69 lakhs	Completed

ii. Ph.D

Name of the student	Name of the Guide	Name of the program	Topic of research	Status of research	Affiliated university
Ms. Winnie Rachel	Prof. Ajish K. Abraham	Ph.D (Electronics)	Development of techniques for automatic detection of articulation errors in Kannada for children with hearing impairment	Ongoing	JSS Science and Technology University
Aneeta S Antony	Prof. Ajish K. Abraham	Ph.D (Electronics)	Design and development of a technique for recognition and comparison of disordered speech with normal	Ongoing	Visvesvaraya Technological University

			speech in Kannada language		
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iii. Dissertation

<b>Name of the Student</b>	<b>Name of the Guide</b>	<b>Topic</b>	<b>Year</b>	<b>Program</b>	<b>University/ Institution</b>
Harshinee Krupanand	Prof. Ajish K. Abraham	Assessing the Validity and Reliability of Dysfluency Detection Tool: A Comparative Analysis with Perceptual Assessment in Stuttering	2024	M.Sc (SLP)	University of Mysore
Dana Mariam Jacob	Prof. Ajish K. Abraham	A comparative analysis of storyblok and adobe experience manager (AEM) for content management solutions	2023	MBA	Amity University
Priyanka G	Prof. Ajish K. Abraham	The role of it in strategic HRM – A study with reference to All India Institute of Speech and Hearing, Mysuru	2023	MBA	Karnataka State Open University
Swathi A S	Prof. Ajish K. Abraham	Challenges faced by professionals and caregivers of Indian AAC users in different settings	2023	M.Sc (SLP)	University of Mysore
Bhavani V	Prof. Ajish K. Abraham	Comparative Study between Grid-Based and Visual Scene Display Based AAC Systems in Children with Cerebral Palsy	2022	M.Sc (SLP)	University of Mysore
Darsitha S alias Sneha S	Prof. Ajish K. Abraham	Development of an Automatic Speech Processing Based Procedure for Assessment of Stuttering in	2022	M.Sc (SLP)	University of Mysore

		Malayalam Speaking Adults through Virtual Mode			
Bandhan Kumar Pradhan	Mr. Manohar. N	Use of technology in the treatment of aphasia : A systematic review	2021	M.Sc (SLP)	University of Mysore
Madhusudhan B.M.	Prof. Ajish K. Abraham	Suitability of Online Voice Acquisition for Assessment of Voice Disorders	2021	M.Sc (SLP)	University of Mysore
Veda P	Prof. Ajish K. Abraham	Development of an Automatic Speech Processing Based Procedure for Assessment of Stuttering in Kannada Speaking Adults through Virtual Mode	2021	M.Sc (SLP)	University of Mysore
Swathy Ravi	Prof. Ajish K. Abraham	Design and Development of Robot for Articulatory Simulation	2020	2020	Vellore Institute of Technology, Vellore
Oshin R Jacob	Prof. Ajish K. Abraham	Emotion Detection using Physiological Signals	2019	2019	Karunya Institute of Technology and Sciences, Coimbatore

iv. Paper published.

*A. Papers published in Peer Reviewed Journals*

1. Manohar. N, Sharanappa V. Halse (2023). IoT Enabled Fall Detection System: Enhancing Safety for Cerebral Palsy Children. International journal for Research in Engineering Application & Management (IJREAM), Vol\_9\_issue\_5 ISSN: 2454-9150.
2. Girish KS, Pushpavathi M, **Abraham AK**, Vikram CM (2022). Automatic speech processing software – New sensitive tool for the assessment of nasality: A preliminary study. *J Cleft Lip Palate Craniofac Anomal* , 9, 14-23
3. Siddhanna Janai., Shreekanth, T., Chandan, M., & **Ajish K Abraham** (2021). Speech-to-Speech Conversion: An Approach to Enhance the Speech Intelligibility of Dysarthric Speaker.

*International Journal of Ambient Computing and Intelligence (IJACI)*, 12(1), 184-206. DOI: 10.4018/IJACI.2021010108. ISSN: 1941-6237.

4. **Abraham, A. K.,** & Ravishankar, M. S. (2020). A case study of acoustic intervention in classrooms. *Building Acoustics*, 28 (4), 293–308. <https://doi.org/10.1177/1351010X20975765>. ISSN: 1351-010X. 28(1)
5. Swathy, Ravi., **Abraham, Ajish K.**, Sivaramakrishnan, V., Swapna, N., & Manohar, N. (2020). Analysis of Kannada speaker's tongue profile for articulatory simulation. *Journal of Child Language Acquisition and Development*, 8(2), 22-35. ISSN: 2148-1997. DOI: [http://jclad.science-res.com/archives\\_full\\_issu/Vol\\_8\\_issue\\_2/JCLAD\\_FULL\\_ISSUE\\_8\\_2.pdf](http://jclad.science-res.com/archives_full_issu/Vol_8_issue_2/JCLAD_FULL_ISSUE_8_2.pdf)
6. Pushpavathi, M., **Abraham, Ajish K.**, MahadevaPrasanna, S R., & Girish, K.S. (2018). Impact of timing of palatal repair on speech errors in children with CLP. *Journal of Child Language Acquisition and Development*, 6(4), 122-133. ISSN: 2148-1997. DOI: <https://juniperpublishers.com/gjo/pdf/GJO.MS.ID.555928.pdf>.
7. **Abraham, Ajish K.** (2018). Efficacy of a wiener filter based technique for speech enhancement in hearing aids. *World Academy of Science, Engineering and Technology, International Science Index, Medical and Health Sciences*, 12(11), 3498.
8. Pushpavathi, M., **Abraham, Ajish K.**, Mahadeva Prasanna, S.R., & Girish, K.S. (2018). Impact of timing of palatal repair on resonance, understandability, and acceptability in children with repaired cleft lip and palate. *Global Journal of Otolaryngology*, 16(1), 11-16, DOI: 10.19080/GJO.2018.16.555928. ISSN: 2474-7556.
9. Akshay, M., Devi, N., Renuka, C., & **Abraham, Ajish K.** (2018). Need for robotic resources in speech and hearing: An Indian study. *International Journal of Advances in Science, Engineering and Technology*, 6(1), 35-38. ISSN (print): 2321 –8991.
10. **Abraham, Ajish K.**, Abhisheka, T E., and Manohar, N. (2017). Current strategies for noise reduction in hearing aids - A review. *Journal of All India Institute of Speech & Hearing*, 36, 75-82. ISSN (print): 0973-662X. DOI: [http://aiishmysore.in/ka/admin/file\\_att/jaiish\\_vol\\_36.pdf](http://aiishmysore.in/ka/admin/file_att/jaiish_vol_36.pdf)
11. Renuka, C., **Abraham, Ajish K.**, Devi, N., & Swapna, N. (2017). Robotic communicative tool in speech and hearing: A review. *International Journal of Innovative Research in Management, Engineering and Technology*, 2(5), 40-43. ISSN: 2350-0557. DOI: [https://www.researchgate.net/profile/Devi\\_N/publication/317954329\\_ROBOTIC\\_COMMUNICATIVE\\_TOOL\\_in\\_Speech\\_and\\_Hearing\\_A\\_review/links/5b2ca3720f7e9b0df5ba6c6a/ROBOTIC-COMMUNICATIVE-TOOL-in-Speech-and-Hearing-A-review.pdf](https://www.researchgate.net/profile/Devi_N/publication/317954329_ROBOTIC_COMMUNICATIVE_TOOL_in_Speech_and_Hearing_A_review/links/5b2ca3720f7e9b0df5ba6c6a/ROBOTIC-COMMUNICATIVE-TOOL-in-Speech-and-Hearing-A-review.pdf)
12. **Abraham, Ajish K.**, Chandni, Jain., & Yashaswini, L. (2016). Effect of ambient noise on puretone hearing screening test conducted in Indian rural locations. *Journal of All India Institute of Speech & Hearing*, 35, 58-65. ISSN (print): 0973-662X. DOI: [https://aiishmysore.in/en/admin/file\\_att/jaiish\\_vol\\_35.pdf](https://aiishmysore.in/en/admin/file_att/jaiish_vol_35.pdf).

13. Renuka, C., & **Abraham, Ajish K.** (2016). Computer intervention module for children with hearing impairment. *International Journal of Electrical, Electronics and Data Communication* 4(10), 19-24. ISSN: 2321-2950.
14. Hariprasad, B., Shreekanth, T., & **Abraham, Ajish K.** (2016). Reaction time measurement system for the assessment of persons with auditory processing disorder. *IOSR Journal of VLSI & Signal Processing* 6(04), 50-54. ISSN: 2319 – 4197
15. Apoorva, A., & **Abraham, Ajish K.** (2016). Algorithms for the enhancement of speech signal recorded in adverse conditions. *International Journal for Scientific & Engineering Research* 7(06), 1-6.
16. **Abraham, Ajish K.**, & Manohar, N. (2015). Efficacy of an assistive device for museum visitors with hearing impairment. *Journal of All India Institute of Speech & Hearing*, 34, 111-121.
17. Vijayashri, BNagavi., **Abraham, Ajish K.**, Pushpavathi, M., & Rathnakara, S. (2015). Classification of the velopharyngeal dysfunction in children with cleft palate using cineradiographic images. *International Journal for Scientific Research & Development* 3(04), 3058-3061.
17. **Abraham, Ajish K.**, & Surya, D. (2013). A new algorithm for frequency transposing in digital hearing aids. *Journal of All India Institute of Speech & Hearing*, 32, 183-190.
18. **Abraham, Ajish K.** (2012a). Effect of fast and slow compression on voice onset time in hearing aid processed speech. *Journal of All India Institute of Speech and Hearing*, 31, 202-208.
19. **Abraham, Ajish K.** (2012b). Transformation of voice onset time in hearing aid processed speech and its relation with number of channels in hearing aids. *Journal of All India Institute of Speech and Hearing*, 31, 220-225.

#### B. Chapters Published in Books

1. M. Pushpavathi, **Abraham, Ajish K.**, S. R. Mahadeva Prasanna, and K. S. Girish. (2020). Perceptual Judgments of Resonance, Speech Understand ability, and Speech Acceptability in Children with Repaired Cleft Palate Across Words and Sentences. In Mahavir Singh & Yasser Rafat (Eds.), *Recent Developments in Acoustics*, (pp. 75-83). Springer.
2. **Abraham, Ajish K.** (2017). ICT-Based Outreach Programs: AIISH Model. In B. P. R. Narasimharao, E. Wright, S. Prasad & M. Joshi (Eds.), *Handbook of Research on Science Education and University Outreach as a Tool for Regional Development*, (pp. 196-205). Hershey, PA, USA: IGI Global.
3. **Abraham, Ajish K.** (2013). Technology of Cochlear Implant: An Overview. In Madhuri, Gore (Ed.), *ISHA Monograph on the Cochlear Implant: An Overview*, 13(2), (pp. 5-12) Mysore: Indian Speech and Hearing Association.
4. **Abraham, Ajish K.**, Savithri, S.R., & Basavaraj, V. (2012). Virtual Classroom-based Model for Rehabilitation of Persons with Communication Disorders. In Tiwari, M.D., Shah, S., &

Tiwari, I (Eds.), *Disability Rehabilitation Management Through ICT*, (pp. 149-157). Aalborg, Denmark: River Publishers.

5. Subramanya, M.B., & **Abraham, Ajish K.** (2012). Active Noise Cancellation of HVAC System Noise in Audiometric Test Rooms. In K. Shama., K. P. Nayak & S. Bhat (Eds.), *Electronic Design and Signal Processing*, (pp. 48-52). New Delhi: Narosa Publishing House, Pvt. Ltd.
6. **Abraham, Ajish K.**, & Basavaraj, V. (2007). Technology enhanced distance learning – The AIISH Model. *Changing Societal Demands and Adopting Teaching – Learning Systems in Higher Education to reach out.* 119-124. University of Mysore.
7. Gunjan, Chand., Basavaraj, V., & **Abraham, Ajish K.** (2006). Acoustic Analysis of the Speech Processed Through Three Amplification Strategies and Their Effect on Speech Recognition Scores of Individual with Severe Hearing Impairment. *Student Research at AIISH, Mysore*, Volume V Part A, 78-92.

### C. Papers Published in National/International Conference/Seminar Proceedings

1. Manohar, N (2023). Efficacy of Computerized Listening Training for Kannada Speaking Children with Hearing Impairment. International Conference on recent trends in Science & Technology (ICRTST), Mysuru
2. Manohar, N (2023). IOT Enabled Fall Detection System – Its significance in children with Balancing Issues. 17<sup>th</sup> Kannada vijnana Sammelana, Tumkur
3. Manohar, N (2023). Efficacy of a IoT-Enabled Fall Detection System in Children with Cerebral Palsy. 4<sup>th</sup> ISAAC India AAC Conference & AIISH
4. Motepalli, Kowshik S. S., Narasinga, V., Pathuri, H., Khan, H., Mahesh, S., **Abraham, A. K.**, & Vuppala, A. K. (2023). Stuttering Detection Application. *Proc. Interspeech 2023*, 680-681.
5. **Abraham, A.K.**, Sivaramakrishnan, V., Swapna, N., Manohar, N. (2021). Image-Based Assessment of Jaw Parameters and Jaw Kinematics for Articulatory Simulation: Preliminary Results. *Proc. Interspeech 2021*, 621-625, doi: 10.21437/Interspeech.2021-1155.
6. **Abraham, Ajish K.**, Pushpavathi, M., Sreedevi, N., Navya, A. & S R M Prasanna (2020). Spectral Moment and Duration of Burst of Plosives in Speech of Children with Hearing Impairment and Typically Developing Children – A comparative Study. *Proc. Interspeech 2020*, 4981-4985, DOI: <http://dx.doi.org/10.21437/Interspeech.2020-1805>.
7. **Abraham, Ajish K.**, Pushpavathi, M., Sreedevi, N., & Navya, A. (2019). Exploring Acoustic Measures of Vowels (VSA, FCR3, VAI4, VFR) in Children with Hearing Impairment. In Sasha Calhoun, Paola Escudero, Marija Tabain & Paul Warren (eds.) *Proceedings of the 19th International Congress of Phonetic Sciences, Melbourne, Australia 2019* (pp. 1064-1068).
8. Renuka, C., Swapna, N., Bhavana, P V., Prabha, L., & **Abraham, Ajish K.** (2019). Touch Screen: An interactive platform to learn arithmetic concepts for hearing impaired children

attending preschool: Case Study, *2019 1st International Conference on Advances in Information Technology (ICAIT)*, Chikmagalur, India, 2019, pp. 382-388. DOI: 10.1109/ICAIT47043.2019.8987275.

9. Hegde, Nidhi., Bullakkanavar, Rajat., Renuka, C., Veena, R., & **Abraham, Ajish K.** (2018). A Technical Approach to Find Defects during Articulation of Phonemes. *Proceedings of 3<sup>rd</sup> International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECCOT-2018)*.355
10. CM, V., Prasanna, S R M., **Abraham, Ajish K.**, M, P., K S, G. (2018). Detection of Glottal Activity Errors in Production of Stop Consonants in Children with Cleft Lip and Palate. *Proc. Interspeech 2018*, 382-386, DOI: 10.21437/Interspeech.2018-1665.
11. Jaisinghani, Priyanka., Manjula, P., & **Abraham, Ajish K.** (2018). Systematic Review on the Performance Evaluation of Speech Enhancement Strategies in Individuals with Normal Hearing and Those with Hearing Loss. *Proceedings of International Workshop on Speech Processing for Voice, Speech and Hearing Disorders, A Satellite Workshop of Interspeech 2018*, 8-9, September 2018, All India Institute of Speech & Hearing, Mysuru
12. Vikram, C M., Pushpavathi, M., **Abraham, Ajish K.**, Girish, K S., & MahadevaPrasanna, S R. (2018). Spectro-Temporal Analysis of Stop Consonant Production Errors in Children with Cleft Lip and Palate. *Proceedings of International Workshop on Speech Processing for Voice, Speech and Hearing Disorders, A Satellite Workshop of Interspeech 2018*, 8-9, September 2018, All India Institute of Speech & Hearing, Mysuru.
13. Dubey, Akhilesh Kumar., Pushpavathi, M., **Abraham, Ajish K.**, Girish, K S., MahadevaPrasanna, S R., & Dandapat, S. (2018). Sinusoidal model based features for analysis of hypernasality severity. *Proceedings of International Workshop on Speech Processing for Voice, Speech and Hearing Disorders, A Satellite Workshop of Interspeech 2018*, 8-9, September 2018, All India Institute of Speech & Hearing, Mysuru
14. Kalita, Sishir., Pushpavathi, M., **Abraham, Ajish K.**, Girish, K S., MahadevaPrasanna, S R., & Dandapat, S. (2018). Relative contribution of hypernasality, consonant production errors, and voice disorders on the intelligibility of cleft lip and palate speech. *Proceedings of International Workshop on Speech Processing for Voice, Speech and Hearing Disorders, A Satellite Workshop of Interspeech 2018*, 8-9, September 2018, All India Institute of Speech & Hearing, Mysuru
15. **Abraham, Ajish K.**, & Ravishankar, M. S. (2016). Cost Effective Acoustic Solutions to Optimize Reverberation Time. *Proceedings of International Symposium on Acoustics for Engineering Applications*, 17-19, November 2016, KIIT College of Engineering, Gurgaon.
16. **Abraham, Ajish K.**, & Jain, Chandni. (2016). Indigenous Technology for providing hearing screening services to the villager's doorstep. *Proceedings of 103rd Indian Science Congress*, 3-7, January 2016, University of Mysore, Mysore.
17. **Abraham, Ajish K.**, Rajarajan, R., & Kalaiselvi, V T. (2015). Preference to RIC – A paradigm shift in hearing aid adoption: A 10 years report. *Proceedings of 8<sup>th</sup> National Women's Science Congress*, (pp. 40), Bengaluru, India.



18. **Abraham, Ajish K., & Manohar, N.** (2014). Assistive technology to override poor acoustics for museum visitors with hearing impairment. *Proceedings of the National Symposium, NSA 2014*, 12-14, November 2014, AIISH, Mysore.
19. **Abraham, Ajish K., & Kalai Selvi, V T.** (2014). Hearing aids with artificial intelligence – Efficacy in speech signal processing. *Proceedings of the International Symposium, FRSM 2014*, 13-14, March 2014, AIISH, Mysore, 5-9.
20. **KalaiSelvi, V T., & Abraham, Ajish K.** (2013). Efficacy of frequency transposition in digital hearing aids. *Proceedings of National Conference of Advances in Engineering and Technology (NCAET)*, 267-272.
21. **Abraham, Ajish K.** (2008). Principles and theoretical constructs in calibration of audiological measurement equipment's: OAE, Immittance & ABR. *Proceedings of the Workshop on "Standards & Calibration of Audiologic & Speech Equipment"*, Sweekar, Secudnerabad.30-38.
22. **Abraham, Ajish K.** (2008). Care & maintenance of electronic devices in a classroom for children with hearing impairment. *Proceedings of National Workshop on Setting up Classrooms for Children with Hearing Impairment, AIISH, Mysore*, 4.1 – 4.11.
23. **Abraham, Ajish K.** (2008). An ideal classroom for children with hearing impairment. *Proceedings of National Workshop on Setting up Classrooms for Children with Hearing Impairment, AIISH, Mysore*, 2.1 – 2.11.
24. **Abraham, Ajish K.** (2001). Touch sensing technique in data acquisition and display system for anesthesia ventilator. *Proceedings of International Conference on Bio medical Engineering, Chennai*, 63-66.
25. **Abraham, Ajish K.** (2000). Real time image acquisition system for ultrasonic scanner. *Proceedings of National conference on Bio medical Engineering, Roorkee*, 288-292.
26. **Abraham, Ajish K.** (1999). Two-dimensional image measurement system. *Proceedings of International Conference and Exhibition on Ultrasonics (IECU – 99), New Delhi*. 39-42.
27. **Abraham, Ajish K.** (1997). Design of a RF amplifier for ultrasonic medical imaging. *Proceedings of National Conference on Advances in Biomedical Engineering, Kochi*. 26-29.