

Hema Arunachalam Murthy

(A) Personal:

Present Occupation : April, 2006, Professor,
Dept. of Computer Science and Engg.,
IIT, Madras.

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Communication and Engg., IIT, Madras -600 036, India.

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(B) Academic:

1. Ph.D (Computer Science and Engineering), Indian Institute of Technology, Madras, July, 1992.
2. M.Eng. (Electrical and Computer Engineering), McMaster University, Hamilton, Ontario, Canada, December, 1985.
3. B.E. (Electronics and Communication Engineering), Osmania University, Hyderabad, June, 1980, I class(Distinction).

(C) Professional Experience:

1. Nov'79 - Jul'80: Worked as a student trainee at D.L.R.L. Hyderabad. Designed and implemented a microprogrammed emulator of the 8080 CPU using AM2900 series bit-slice processor and sequencer.
2. Sept'80–Aug'83: Worked as a Scientific Officer(SO/SC) in the Speech and Digital Systems Group of T.I.F.R., Bombay. Designed and implemented (i) a three dimensional graphics system GRASP in Pascal (ii) an editor for drafting circuit layout.
3. Sept'83–Dec'85: Worked as a Teaching assistant(10 hours a week) at McMaster University, Canada, during Fall and Winter Sessions from Sept, 1983-Dec.,1985.
4. Jan'86–Apr'86: Research Assistant and part-time Graduate Student in Communications Research Laboratory, McMaster University, Canada.
5. Jul'86–Aug'88: Research Scholar (Full-time), Dept. of Computer Science and Engg., IIT, Madras.
6. Aug'88 - Jul'92 : Lecturer (and part-time research scholar), Department of Computer Science and Engineering, IIT Madras - 600 036.
7. Jul'92–Feb'93 : Lecturer, Department of Computer Science and Engineering, IIT, Madras - 600 036.
8. Feb'93–Sept'00: Asst. Professor, Department of Computer Science and Engineering, IIT, Madras - 600 036.

9. Sept'00–Apr'06: Associate Professor, Department of Computer Science and Engineering, IIT, Madras - 600 036.
10. Apr'06- : Professor, Department of Computer Science and Engineering, IIT, Madras - 600 036.
11. Jun'95–Jun'96: International Fellow, STAR Laboratory, SRI International, 333, Ravenswood Avenue, Menlo Park, CA 94025 (on leave from IIT, Madras).
12. Jun'98–Jul'98 (six weeks): Visitor at TIFR Bombay
13. Jun'02–Aug'02 :International Fellow, STAR Laboratory, SRI International, 333, Ravenswood Avenue, Menlo Park, CA 94025 (on leave from IIT, Madras).
14. May'2016 – Aug'2016 (one month): Visitor as part of Computation Brain Research, Sur Lab, MIT, Cambridge.

(D) Publications: *In Journals*

1. Padi Sarala and Hema A Murthy, “Segmentation of Continuous Audio Recordings of Carnatic Music Concerts into Items for Archival,” accepted *Sadhana*, 2018.
2. M S Saranya, Padmanabhan Rajan and Hema A Murthy, “Feature-switching: Dynamic feature selection for an i-vector based speaker verification system,” accepted for publication, *Speech Communication*, Vol.93, pp.53-62, 2017.
3. Golda Brunet Rajan and Hema A Murthy, “Transcription Correction Using Group Delay Processing for Continuous Speech Recognition,” *Circuits Systems Signal Processing*, Vol 37, pp.1177-1202, Jan 2018.
4. Rajeev Rajan and Hema A Murthy, “Two-pitch tracking in co-channel speech using modified group delay functions,” Vol 89, pp.37-46, *Speech Communication*, 2017.
5. Rajeev Rajan, Manaswi Mishra and Hema A Murthy, “Melody extraction from music signals using modified group delay functions,” Vol 20, pp.185-204, *Int. J of Speech Technology*, Jan 2017.
6. Jilt Sebastian, P A Manoj Kumar and Hema A Murthy, “An analysis of the high resolution property of group delay function with applications to audio signal processing,” *Speech Communication*, Elsevier, Vol 81, pp.42-53, July 2016.
7. Saad Y Sait, Akshay Bhandari, Shreya Khare, Cyriac James and Hema A Murthy, Multi-level anomaly detection: Relevance of Big Data Analytics in Networks, Vol 40, Issue 6, pp.1737–1767, *Sadhana*, Springer-Verlag.
8. Srikanth Madikeri, Asha Talambedu and Hema A Murthy, Modified Group Delay Feature based Total Variability Space modelling for Speaker Recognition, *International Journal of Speech Technology*, Springer-Verlag, *Int J Speech Technol* (2015) 18:1723 DOI 10.1007/s10772-014-9243-7.
9. Padi Sarala and Hema A Murthy, Cent Filter-Banks and its Relevance to Identifying the Main Song in Carnatic Music, *Sound, Music, and Motion - 10th International Symposium, CMMR 2013*, Marseille, France, October 15-18, 2013. Revised Selected Papers, Springer Verlag (2014) (Book Chapter).

10. Sankalp Gulati, Ashwin Bellur, Justin Salamon, Vignesh Ishwar, Hema A Murthy and Xavier Serra, Automatic tonic identification in Indian art music: Approaches and evaluation, *Journal of New Music Research*, Publisher: Taylor and Francis, Vol 43, No.1, pp.53-71. 2014.
11. Preeti Rao, Joe Cheri Ross, Kaustuv Kanti Ganguli, Vedhas Pandit, Vignesh Ishwar, Ashwin Bellur and Hema Murthy, Melodic Motivic Analysis of Indian Music, *Journal of New Music Research*, Publisher: Taylor and Francis, Vol 43, No.1, pp. 115-131, 2014.
12. Ranbir Sanasam Singh, Hema Murthy and Timothy Gonsalves, "Inference Based Query Expansion Using Real Time Implicit Feedback," in *Communications in Computer and Information Science Series*, Springer-Verlag, Second International Joint Conference, IC3K 2010, Valencia, Spain, October 25-28, 2010, Revised Selected Papers, pp.158-172 (Book Chapter).
13. Hema A Murthy and B Yegnanarayana, "Group delay functions and its application to speech technology," *Sadhana, Indian Academy of Sciences*, Vol 36, No. 5, pp.745-782, November, 2011.
14. Angelos Marnerides, Cyriac James, Alberto Schaeffer-Filho, Saad Yunus Sait, Andreas Mauthe, Hema Murthy, "Multi-level network resilience: traffic analysis, anomaly detection and simulation," In: *ICTACT Journal on Communication Technology, Special Issue on Next Generation Wireless Networks and Applications*. Vol. 2, n. 2. 2011.
15. Santosh Kumar Chaudhari and Hema A Murthy, Energy Aware Network: Bayesian Belief Networks based Decision Management System, *ICTACT Journal on Communication Technology (Special Issue on Next Generation Wireless Networks and Applications)*, 2011, vol. 2, issue 2, pp. 357-362.
16. Sreehari Krishnan, R Padmanabhan and Hema A Murthy, "Robustness of group delay representations for noisy speech signals," *International Journal of Speech Technology*, Vol.14, pp.361-368, Sept., 2011.
17. S Nagireddy, Hema A Murthy, S Kant, "Identification of encryption method for block ciphers using histogram method," *Journal of discrete mathematical sciences and cryptography*, Vol 13, No 4, August 2010, pp.319-328.
18. G L Sarada, A Lakshmi, Hema A Murthy and T Nagarajan, "Automatic Transcription of Continuous Speech into Syllable-like units for Indian Languages," *Sadhana, Indian Academy of Sciences*, Vol. 34, Part 2, April 2009, pp. 221-233.
19. Rajesh M. Hegde, Hema A. Murthy and Venkata Ramana Rao Gadde, "Significance of Joint Features Derived from The Modified Group Delay Function in Speech Processing," *EURASIP Journal on Applied Signal Processing*, Vol.2007, Article ID 79032, 13 pages.
20. Rajesh M. Hegde, Hema A. Murthy and Venkata Ramana Rao Gadde, "Significance of The Modified Group Delay Function in Speech Recognition", *IEEE Transactions on Speech and Audio Processing*, Vo1.15, Issue.1, Jan 2007, pp.190-202.
21. T Nagarajan and Hema A Murthy, "Language Identification using Acoustic Log-Likelihood of Syllable-like units," *Speech Communications*, Vol.48, pp.913-926, 2006.
22. T Nagarajan and Hema A Murthy, "Group Delay based Segmentation of Spontaneous Speech into Syllable-like units," *EURASIP Journal of Applied Signal Processing*, Vol.17, pp.2614-2625, 2004.

23. V. Kamakshi Prasad, T. Nagarajan and Hema A. Murthy, "Automatic segmentation of continuous speech using minimum phase group delay functions," *Speech Communications*, Elsevier, vol.42, pp.429-446, 2004.
24. T. Nagarajan, V. Kamakshi Prasad and Hema A. Murthy, "Minimum phase signal derived from the root cepstrum," *IEE Electronics Letters*, Vol.39, No.12, pp.941-942, June, 2003.
25. Hema A. Murthy, Francoise Beaufays, Larry P.Heck, Mitchel Weintraub, "Robust Text Independent Speaker Identification over Telephone Channels," *IEEE Trans. on Speech and Audio Processing*, Vol.7, No.5, pp.554-568, 1999.
26. M.Narendranath, Hema A.Murthy, S.Rajendran and B.Yegnanarayana, "Transformation of formants for voice conversion using artificial neural networks," *Speech Communication*, vol.16, no.2, pp.206-216, 1995.
27. B.Yegnanarayana and Hema A. Murthy, "Significance of Group Delay functions in Spectrum estimation," *IEEE Trans. on Signal Processing*, Vol.40, No.9, pp.2281-2289, Sep. 1992.
28. Hema A. Murthy and B. Yegnanarayana "Formant extraction from group delay function," *Speech Communication*, Vol.10, pp.209-221, Aug., 1991.
29. Hema A. Murthy and B. Yegnanarayana, "Speech processing using Group delay functions," *Signal Processing*, Vol.22, pp.259-267, March, 1991.
30. Hema A. Murthy, K.V. Madhu Murthy and B. Yegnanarayana, "Formant extraction from phase using weighted group delay function," *Electronics letters*, 9th Nov., 1989, Vol.25, No.23, pp.1609-1611.
31. Hema A. Murthy and Simon Haykin, "Bayesian classification of surface-based ice-radar images," *IEEE Journal of Oceanic Engineering*, Vol. OE-12, No.3, pp.493-501, July, 1987.
32. R.R. Joshi and Hema Arunachalam, "Multi-Level Picture Segmentation in the Graphics System GRASP," *Computers and Graphics*, Pergamon Press, Vol.8,No.2,pp.167-176,1984.
33. R.R. Joshi and Hema Arunachalam,"GRASP - A 3D Graphics System for Pascal Users," *Computers and Graphics*, Pergamon Press, Vol.8,No.1,pp.93-102, 1984.
34. B.Yegnanarayana, K.V. Madhu Murthy and Hema A. Murthy, "Applications of Group Delay Functions in speech processing," *JIETE Special issue on Speech processing*, Jan 1988.

In Books:

1. S R Singh, Hema A Murthy and T A Gonsalves, "Inference based query expansion using user's real time implicit feedback," *Knowledge Discovery, Knowledge Engineering and Knowledge management*, Vol 272, pp.158-172, 2013.
2. Hema A Murthy, Francoise Beaufays, Larry P Heck and Mitchel Weintraub, "Issues in Speaker Identification over Telephone Channels," *invited paper in Speech Technology, Issues and Implications in Indian Languages*, Ed. K Nagamma Reddy, Dravidian Linguistics Association, International School of Dravidian Linguistics, Thiruvananthapuram, Kerala, 2000.

In Refereed International Conferences:

1. G Kasthuri, Namita Jacob, Anil Prabhakar, Prabha, and Hema A Murthy, "Early vocabulary development through picture based software solutions," accepted INTERSPEECH 2018 Show and Tell.
2. Gayathri Sekharan, N Mohana, Radhika Pal and Hema A Murthy, "Mobile application for learning languages for the unlettered," accepted INTERSPEECH 2018 Show and Tell.
3. Srihari Maruthachalam, Sidharth Agarwal and Hema A Murthy, "Brain computer interface using encephalogram signatures of eye blinks," accepted INTERSPEECH 2018 Show and Tell.
4. Venkatasubramanian Viraraghavan, Hema A Murthy and R Aravind, "Precision of sung notes in Carnatic music," accepted ISMIR 2018.
5. Mahesh M, Jeena J Prakash and Hema A Murthy, "Resyllabification in Indian languages and its implication in text to speech synthesis," accepted INTERSPEECH 2018.
6. Anju Leela Thomas, Anusha Prakash, Arun Baby and Hema A Murthy, "Code Switching in Indic speech synthesizers," accepted INTERSPEECH 2018.
7. Jeena J Prakash, Golda Brunet Rajan and Hema A Murthy, "Transcription correction of Indian languages using acoustic signatures," accepted INTERSPEECH 2018.
8. Nauman Daulatabad, Jom Kuriakose, C Chandra Sekhar and Hema A Murthy, "Information bottleneck based percussion instrument diarization system for taniavartanam segments of Carnatic music concerts," accepted INTERSPEECH 2018.
9. M S Saranya and Hema A Murthy, "Decision level feature switching as a paradigm for replay attack detection," accepted INTERSPEECH 2018.
10. Jilt Sebastian, Manoj Kumar, Pavan Kumar D S, Mathew Magimai Doss, Hema A Murthy, Shrikanth Narayanan, "Denoising and raw-waveform networks for weakly supervised gender identification on noisy speech," accepted INTERSPEECH 2018.
11. Manish Jain, M S Saranya and Hema A Murthy, "An SVD based approach for spoken language identification," accepted SPCOM 2018.
12. M S Saranya and Hema A Murthy, "Replay attack detection in speaker verification using non-voiced segments and decision level feature switching," accepted SPCOM 2018.
13. Jilt Sebastian and Hema A Murthy, "ONSET DETECTION IN COMPOSITION ITEMS OF CARNATIC MUSIC," Proceedings of the 18th International Society for Music Information Retrieval Conference, ISMIR 2017, Suzhou, China, October 23-27, 2017 (ISMIR 2017) ,pp.560-567, Oct 2017.
14. Venkatasubramanian Viraraghavan, R Aravind and Hema A Murthy, "A Statistical Analysis of Gamakas in Carnatic Music," Appeared in Proceedings of the 18th International Society for Music Information Retrieval Conference, ISMIR 2017, Suzhou, China, October 23-27, 2017 (ISMIR 2017) ,pp.243-249, Oct 2017.
15. Sakshi Verma, K L Prateek, Karthik Pandia, Nauman Daulatabad, Jitendra Sharma, Rogier Lander, Mriganka Sur and Hema A Murthy, "Discovering Language in Marmoset Vocalization," Interspeech 2017, 18th Annual Conference of the International Speech Communication Association, Stockholm, Sweden, August 20-24, 2017, pp.2426-2430, Aug 2017.

16. Atish Shankar Ghone, Rachana Nerpagar, Pranaw Kumar, Arun Baby, S. Aswin Shanmugam, Sasikumar M., Hema A. Murthy, "TBT (Toolkit to Build TTS): A High Performance Framework to Build Multiple Language HTS Voice," Appeared in Interspeech 2017 Show and Tell, 18th Annual Conference of the International Speech Communication Association, Stockholm, Sweden, August 20-24, 2017, pp.3427-3428, Aug 2017
17. Arun Baby, Jeena J Prakash, Rupak Viswanathan, and Hema A Murthy, "Deep Learning Techniques in Tandem with Signal Processing Cues for Phonetic Segmentation for Text to Speech Synthesis in Indian Languages," Interspeech 2017, 18th Annual Conference of the International Speech Communication Association, Stockholm, Sweden, August 20-24, 2017, pp.3817-3821, Aug 2017.
18. Jilt Sebastian, Mari Ganesh Kumar, Y S Sreekar, Rajeev Vijay Rikye, Mriganka Sur and Hema A Murthy, "GDSPIKE: An accurate spike estimation algorithm from noisy Calcium fluorescence signals," IEEE International Conference on Acoustics, Speech and Signal Processing, ICASSP 2017, New Orleans, LA, USA, March 5-9, 2017 (ICASSP 2017), pp.1043-1047, Mar 2017.
19. Saad Y Sait, Hema A Murthy and S Krishnamoorthy Sivalingam, "Organization-level control of excessive Internet downloads," Appeared in 41st IEEE Conference on Local Computer Networks, LCN 2016, Dubai, United Arab Emirates, November 7-10, 2016 (LCN 2016) ,pp.184-187, Nov 2016.
20. Anusha Prakash and Hema A Murthy, "Improvement of Continuous Dysarthric Speech Quality," accepted SLPAT 2016.
21. Nauman Dawalatabad, Srikanth Madikeri, C Chandra Sekhar and Hema A Murthy, "Two-Pass IB based Speaker Diarization System using Meeting-Specific ANN based Features," pp.2199-2203, INTERSPEECH Sept, 2016.
22. Anusha Prakash, Jeena J Prakash and Hema A Murthy, "Acoustic Analysis of Syllables across Indian languages," pp. 327–331, INTERSPEECH Sept. 2016.
23. Arun Baby, N L Nishanthi, Anju Thomas and Hema A Murthy, "A unified parser for developing Indian language text to speech synthesizers," TSD, Volume 9924 of the series Lecture Notes in Computer Science pp 514-521.
24. Jilt Sebastian and Hema A Murthy, "Group Delay Based Music Source Separation Using Deep Recurrent Neural Networks," accepted SPCOM 2016.
25. Karthik Pandia and Hema A Murthy, "A Fast Query-by-Example Spoken Term Detection for Zero Resource Languages," accepted SPCOM 2016.
26. Jeena J Prakash and Hema A Murthy, " An analysis of the distribution of syllables in prosodic phrases of stress-timed and syllable-timed languages," *Proc. Speech Prosody*, pp.49-53, 2016.
27. Shreya Khare, Akshay Bhandari and Hema A Murthy, "EIGEN AND MULTIMODAL ANALYSIS FOR LOCALIZING MOVING SOUNDING OBJECTS," *Proc. ICASSP 2016*, pp.2757-2761.
28. Rupak Vignesh Viswanathan, Aswin S Shanmugham and Hema A Murthy, "SIGNIFICANCE OF PSEUDO-SYLLABLES IN BUILDING BETTER ACOUSTIC MODELS FOR INDIAN ENGLISH TTS," *Proc. ICASSP 2016*, pp. 5620-5624.

29. Shrey Dutta, P V Krishna Raj and Hema A Murthy, RAGA VERIFICATION IN CARNATIC MUSIC USING LONGEST COMMON SEGMENT SET, Proc. ISMIR 2015, pp.605-611, Malaga, Spain.
30. Swapnil Gupta, Ajay Srinivasamurthy, Manoj Kumar, Hema A Murthy and Xavier Serra, Discovery of Syllabic Percussion Patterns in Tabla Solo Recordings, Proc. ISMIR 2015, pp.385-391, Malaga, Spain.
31. Sridharan Sankaran, P V Krishna Raj and Hema A Murthy, Automatic Segmentation of Composition in Carnatic Music Using Time-Frequency CFCC Templates, CMMR 2015, Plymouth, UK.
32. Angelos K Marnerides, Akshay Bhandari, Hema A Murthy and Andreas U Mauthe, "A multi-level resilience framework for unified networked environments," *Proc. 2015 IFIP/IEEE International Symposium on Integrated Network Management (IM)*, pp.1369-1372, 2015.
33. Akshay Bhandari and Shreya Khare and Hema A Murthy Systematic Downloading: Analysis and Detection, Proc. ICSPCS2014, pp.1-9, Gold Coast, Australia, 2014.
34. Shrey Dutta and Hema A Murthy, "DISCOVERING TYPICAL MOTIFS OF A RAGA FROM ONE-LINERS OF SONGS IN CARNATIC MUSIC," ISMIR 2014, pp.397-402.
35. S Aswin Shanmugam and Hema A Murthy, "A Hybrid Approach to Segmentation of Speech Using Group Delay Processing and HMM Based Embedded Reestimation," Proc. INTERSPEECH 2014, pp.1648-1652.
36. Asha T, Saranya M S, Karthik Pandia, Srikanth Madikeri and Hema A Murthy, "Feature switching in the i-Vector framework for speaker verification," INTERSPEECH 2014.
37. Asha T and Hema A Murthy, "The relevance of NIST Speaker recognition evaluations," Proc. *SPCOM-2014*.
38. Akshay Ananthapadmanabhan, Juan Bello, Raghava Krishnan and Hema A Murthy, "Tonic independent stroke transcription of the mridangam," *Audio Engineering Society Conference: 53rd International Conference: Semantic Audio*, January, 2014.
39. Patil, H.A. and Patel, T.B. and Shah, N.J. and Sailor, H.B. and Krishnan, R. and Kasthuri, G.R. and Nagarajan, T. and Christina, L. and Kumar, N. and Raghavendra, V. and Kishore, S.P. and Prasanna, S.R.M. and Adiga, N. and Singh, S.R. and Anand, K. and Kumar, P. and Singh, B.C. and Binil Kumar, S.L. and Bhadrans, T.G. and Sajini, T. and Saha, A. and Basu, T. and Rao, K.S. and Narendra, N.P. and Sao, A.K. and Kumar, R. and Talukdar, P. and Acharyaa, P. and Chandra, S. and Lata, S. and Murthy, H.A., "A syllable-based framework for unit selection synthesis in 13 Indian languages, *Proc. O-COCOSDA 2013*, pp.1-8, doi.10.1109/ICSDA.2013.6709851
40. Kumar, P. and Annamalai, G. and Sajini, T. and Konjengbam, A. and Praveen, M. and Kasthuri, G.R. and Prabhakar, A. and Shuo Qiao and Pani, S.K. and Maral, V. and Kumar, S.L.B. and Gopi, A. and Neethu, E.A. and Singh, B.C. and Singh, R. and Murthy, H.A, "Seamless integration of common framework Indian language TTSEs in various applications, *Proc. O-COCOSDA, 2013*, pp.1-6, doi.10.1109/ICSDA.2013.6709873
41. Padi Sarala and Hema A Murthy, "Cent filter banks and its relevance to identifying the main song in Carnatic music," *Proc. CMMR 2013*.

42. Vignesh Ishwar, Shrey Dutta, Ashwin Bellur and Hema A Murthy, "Motif spotting in an Alapana in Carnatic music," pp.499–504, *Proc. ISMIR* 2013.
43. Padi Sarala and Hema A Murthy, "Inter and intra segmentation of Carnatic music recordings for archival," pp.487–492 *Proc. ISMIR* 2013.
44. B. Ramani, S.Lilly Christina, G Anushiya Rachel, V Sherlin Solomi, Mahesh Kumar Nandwana, Anusha Prakash, Aswin Shanmugam S, Raghava Krishnan S P Kishore, K Samudravijaya, P Vijayalakshmi, T Nagarajan and Hema A Murthy, "A Common Attribute based Unified HTS framework for Speech Synthesis in Indian Languages," pp.311–316, *Proc. SSW8*, 2013.
45. Naresh Kumar Elluru, Anandaswarup Vadapalli, Raghavendra Elluru, Hema Murthy and Kishore Prahallad, "Is word-to-phone mapping better than phone-phone mapping for handling English words?," *ACL (2)*, *Publisher: Association for Computational Linguistics*, pp. 196–200, 2013.
46. Abhijit Pradhan, S Aswin Shanmugham, Anusha Prakash, V Kamakoti and Hema A Murthy, "A syllable-based statistical text to speech system," accepted *EUSIPCO, 2013, 1569738809*.
47. Ashwin Bellur and Hema A Murthy, "A novel application of group delay function for identifying tonic in Carnatic Music," *EUSIPCO, 2013., 1569745887*
48. Golda Brunet and Hema A Murthy, "Analysis of vowel deletion in continuous speech," *EUSIPCO, 2013, 1569746923*.
49. Rajan, R and Murthy, H.A., "Group delay based melody monopitch extraction from music," *Acoustics, Speech and Signal Processing (ICASSP)*, 2013 IEEE International Conference on , vol., no., pp.186,190, 26-31 May 2013, doi: 10.1109/ICASSP.2013.6637634
50. Anantapadmanabhan, A, Bellur, A and Murthy, H.A., "Modal analysis and transcription of strokes of the mridangam using non-negative matrix factorization," *Acoustics, Speech and Signal Processing (ICASSP)*, 2013 IEEE International Conference on , vol., no., pp.181,185, 26-31 May 2013 doi: 10.1109/ICASSP.2013.6637633.
51. Srikanth Madikeri, Asha T and H A Murthy, "IIT-M Speaker Recognition System for NIST SRE 2012," Florida, USA, December 2012.
52. Sait, S.Y., Kumar, M.S. and Murthy, H.A., "User traffic classification for proxy-server based internet access control," *Signal Processing and Communication Systems (ICSPCS)*, 2012 6th International Conference on , vol., no., pp.1,9, 12-14 Dec. 2012, doi: 10.1109/ICSPCS.2012.6507980.
53. Cyriac James and Hema A Murthy, "Decoupling Non-Stationary and Stationary Components in Long Range Network Time Series in the Context of Anomaly Detection," *IEEE Local Computer Networks*, pp.76–84, Oct. 2012.
54. Srikanth R. Madikeri, Hema A. Murthy, "Acoustic Segmentation Using Group Delay Functions and Its Relevance To Spoken Keyword Spotting", *Text Speech and Dialogue*, pp.496-504, Sept 2012.
55. R Golda Brunet Murthy, H.A., "Impact of pronunciation variation in speech recognition," *Signal Processing and Communications (SPCOM)*, 2012 International Conference on , vol., no., pp.1,5, 22-25 July 2012, doi: 10.1109/SPCOM.2012.6290037

56. Srikanth Madikeri and Hema A Murthy, "Effect of feature warping and decorrelation on Mel Filterbank Slope for speaker recognition," *Signal Processing and Communications (SPCOM)*, 2012 International Conference on , vol., no., pp.1,5, 22-25 July 2012, doi: 10.1109/SPCOM.2012.6290222
57. Subhadeep Dey and Hema A Murthy, "Unsupervised clustering of syllables for language identification," *Signal Processing Conference (EUSIPCO), 2012 Proceedings of the 20th European*, vol., no., pp.325-329, 27-31 Aug. 2012.
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60. Cyriac James and Hema A. Murthy, "Time Series Models and its Relevance to Modeling TCP SYN Based DoS Attacks," in 7th EURO-NF NGI, Germany, June doi:<http://dx.doi.org/10.1109/NGI.2011.1> pp.1-8, 2011.
61. Vivekanandan, D., Pal, R., Mohana, N., Indumathi, R., Thirumurthi, M., Diana, M.S., Murthy, H.A., Bhuvaneshwari, M., Shajahan, D.A., Behera, N., "An Online Inclusive Examination Framework for India," *Technology for Education (T4E)*, 2011 IEEE International Conference on , vol., no., pp.69,75, 14-16 July 2011 doi: 10.1109/T4E.2011.19
62. Hema A Murthy, ..., Kishore Prahallad, "Building text-to-speech synthesis systems for Indian languages: A consortium effort," *Proc. O-COCOSDA*, Nov. 24-25, Kathmandu, Nepal, 2010.
63. Sanasam Ranbir Singh, Hema A. Murthy and Timothy A. Gonsalves, Feature Selection for Text Classification Based on Gini Coefficient of Inequality, *Proceedings of the Fourth International Workshop on Feature Selection in Data Mining*, 10:76-85, 2010, Hyderabad India.
64. Sanasam Ranbir Singh, Hema A. Murthy and Timothy A. Gonsalves, Dynamic Query Expansion Based on User's Real Time Implicit Feedback, *KDIR 2010*, Valencia Spain, pp.112-121.
65. R Padmanabhan and Hema A Murthy, "Feature diversity and speaker recognition," *Proc. INTERSPEECH 2010* pp.
66. R Padmanabhan, Rajesh Hegde and Hema A Murthy, "Dynamic Selection of Magnitude and Phase based Acoustic Feature Streams for Speaker Verification," *Proc. EUSIPCO 2009*, pp.1244-1248, Glasgow, UK, August 24-28, 2009.
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68. Ankit Malpani, B Ravindran and Hema A Murthy, "Personalised Intelligent Tutoring Systems using Reinforcement Learning," *Multi Disciplinary Symposium on Reinforcement Learning*, Calgary, Canada, June 16-19, 2009.

69. Y R Venugopalakrishna, M V Vinodh, Hema A Murthy and C S Ramalingam, "Methods for improving the quality of syllable based speech synthesis," pp.29-32, SLT-2008, Goa, India.
70. Ramya Rasipuram, Rajesh M Hegde and Hema A Murthy, "Significance of group delay based acoustic features in the linguistic feature space for syllable recognition," accepted for presentation at INTERSPEECH 2008, Australia, 22-26 Sept, 2008
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In Refereed National Conferences

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57. T A Gonsalves, Ashok JhunJhunwala, Hema A Murthy, Hari Selvarajan, D N Rajan, R Siddappa, N Jayaprakash, Prakash Chandra, A Ramasamy, J Joseph, Vaishali P Mane and R Srinivasan, "CygNet: An Integrated Management for Modern Telecom Networks," *Proc.NCC-2000*, Delhi, 2000, pp. 103-106.
58. A Ramasamy, Hema A Murthy and T A Gonsalves, "Linear Prediction for Network Management," *Proc. NCC-2000*, pp.199-202, Delhi, 2000.

59. V. Kamakshi Prasad, Hema A Murthy and C Chandra Sekhar, "Connected Digit Recognition Using Minimum Phase Group Delay Functions," *Proc.IRIL-99*, Hyderabad, pp. 15-1, November 12-14, 1999.
60. Jyotsana Balledda and Hema A Murthy, "Spoken Language Identification System for Indian Languages" *Proc.IRIL-99*, Hyderabad, pp. 20-1, November 12-14, 1999.
61. Jyotsana Balledda, S.Vela and Hema A Murthy, "A New Model for Speaker Identification using Affine Transformation," *Proc. SPCOM-99*, IISc, Bangalore, India, pp.121-124, July 21-24, 1999.
62. Hema A Murthy, Jyotsana Balledda and C Chandra Sekhar, "Identifying the location of Digits in a Connected Digit Sequence Using Minimum Phase Group Delay Functions," *Proc.NCC-99*, Kharagpur, pp.157-162, Jan 29-31, 1999.
63. Hema A. Murthy, Francoise Beaufays, Larry P Heck and Mitchel Weintraub "Feature Extraction for Speaker Identification," *Proc. SPCOM-97*, Bangalore, India, pp.43-50, July 16-19, 1997.
64. Hema A. Murthy, "The Real Root Cepstrum and its Application to Speech Processing," *Proc.NCC-97*, pp.180-183, Madras, India.
65. S.R.Rajesh Kumar, V.R.Ramachandran, A.S.Madhukumar, Hema A. Murthy and B.Yegnanarayana, "A text-to-speech system for Indian languages," presented at the Seminar on Common Phonetic Matrix for Indian Languages, CIIL, Mysore, India, March, 1990.
66. Hema Arunachalam and S. Pannageshwari and P. Vijaykumar, "Emulation of 8080 CPU - a bit-slice approach," Student paper presented at CSI Convention, Delhi, March 1981.

In non-Refereed Indian Conferences

- S.R.Rajesh Kumar, V.R.Ramachandran, A.S.Madhukumar, Hema A. Murthy and B.Yegnanarayana, "A text-to-speech system for Indian languages," presented at the Seminar on Common Phonetic Matrix for Indian Languages, CIIL, Mysore, India, March, 1990.
- M.Eng thesis (by research):

Title: Statistical Classification of Sea-Ice
 Advisor: Simon Haykin, Director, Communications Research
 Laboratory, McMaster University, Hamilton,
 Ontario, Canada.

- Ph.D Thesis:

Title: Algorithms for processing Fourier transform
 phase of Signals
 Advisor: B. Yegnanarayana, Professor, Department of
 Computer Science and Engineering,
 IIT, Madras, India.

(E) Research Interests : Speech signal processing for synthesis, recognition, speaker verification, language recognition, time series models computer networks, machine learning for speech, data networks and text mining.

(F) Research Scholars (Completed):

1. P V Krishnaraj Sekhar, "Technology assisted archival and learning of varnams in Carnatic music," MS Thesis (submitted) 2018.
2. Arun Baby, "A unified approach to speech synthesis in Indian languages," MS Thesis (submitted) 2018.
3. Golda Brunet Rajan, "Transcription correction using signal processing and its application to continuous speech recognition," PhD Thesis 2018.
4. Sridharan Sankaran, "Segmentation of musical items: A computational perspective," MS Thesis 2017.
5. Rajeev Rajan, "Estimation of Pitch in Speech and Music Signals Using Modified Group Delay Functions," PhD Thesis, IIT Madras, 2017.
6. Saad Y Sait, "Organizational level control of abusive traffic," (co-Guide: S Krishna Sivalingam), PhD Thesis, IIT Madras, 2017.
7. Anusha Prakash, "Cross-lingual Speech Synthesis and Enhancement of Dysarthric Speech," (co-Guide, Prof. Ramasubba Reddy, Applied Mechanics), MS Thesis IIT Madras, 2017.
8. Shreya Khare, "Multimedia Content Analysis And Its Application For Sound Source Localisation," M S Thesis, IIT Madras, 2017.
9. Asha T, "Relevance of front-end processing in Speaker Recognition," MS Thesis, IIT Madras, 2016.
10. Shrey Dutta, "Analysis of Motifs in Carnatic Music: A Computational Perspective," M S Thesis, IIT Madras, 2016.
11. Akshay Bhandari, Feature extraction for anomaly detection, M S Thesis, IIT Madras, 2016.
12. Aswin S Shanmugam, A HYBRID APPROACH TO SEGMENTATION OF SPEECH USING SIGNAL PROCESSING CUES AND HIDDEN MARKOV MODELS, M S Thesis, IIT Madras, 2016.
13. Raghava Krishnan, PROSODIC ANALYSIS OF INDIAN LANGUAGES AND ITS APPLICATIONS TO SPEECH SYNTHESIS, M S Thesis, IIT Madras, 2016 (co-guide: Prof. S. Umesh, Dept. of EE, IIT Madras)
14. Padi Sarala, Applause identification and its application to archival of Carnatic Music, April 2015.
15. M R Srikanth, "Speaker Verification and Keyword Spotting Systems for Forensic Applications," PhD Thesis, 2013.
16. Ashwin Bellur, "Automatic Tonic identification Indian classical music," MS Thesis, 2014 (Co-guide, Prof. R Aravind, Dept. of EE)

17. Chaitanya Kumar, "Information theoretic measures to incorporate multiple feature streams in the linguistic search space for automatic speech recognition," MS Thesis, 2013 (Co-guide: Prof. C Chandra Sekhar, Dept. of CS&E).
18. Subhadeep Dey, "Universal syllable models for language identification," MS Thesis, IIT Madras, 2013.
19. Santosh Kumar Chaudhari, "Green IT: Energy efficient techniques for network management for core networks and data centers," MS Thesis, IIT Madras, 2013.
20. Cyriac James, "Relevance of time series in network traffic modeling: In the context of TCP SYN DOS attacks," M S Thesis, IIT Madras, 2012.
21. R Padmanabhan, "Studies on voice activity detection and feature diversity for Speaker Recognition," Ph.D Thesis, IIT Madras, 2012.
22. Rajesh Janakiraman, "Syllable Section and its Application to Syllable-centric Continuous Speech Recognition," M.S Thesis, IIT Madras, 2012 (Co-guide: Prof. C Chandra Sekhar).
23. Sanasam Ranbir Singh, " On the importance of Crawling, Text Clustering Realtime Implicit Feedback in Web Search Engines," (Co-guide, Prof. T A Gonsalves, Dept. of CS&E, IIT Madras) Ph.d Thesis IIT Madras, 2010.
24. Nikhil Ranjan, "GARCH Models for TCP based Denial of Service Attacks," (Co-guide: Prof. T A Gonsalves, Dept. of CS&E, IIT Madras) MS Thesis, 2010.
25. Y R Venugopalakrishna, " Methods for Improving the Quality of Syllable-Based Speech Synthesis for Indian Languages," (Co-guide: Prof. C.S Ramalingam, EE, Dept) MS Thesis, IIT Madras, 2009.
26. P R Ramya, "Incorporating acoustic feature diversity in linguistic search space for speech recognition," (Co-guide: Prof. C.S Ramalingam, EE, Dept) MS Thesis, IIT Madras, 2009.
27. Sadhana Chevireddy, "A syllable-based segment vocoder," (Co-guide: Prof. C Chandra Sekhar, Dept. of CS&E), MS Thesis, 2009
28. P G Deivapalan, "A Segmented Syllable-based, Isolated Word Recognizer for Indian Languages," M S Thesis, IIT Madras, 2009.
29. Pranav Hamnabhadkar, "Pattern Recognition and Synthesis of Materials Microstructures," (Co-guide: Prof. K Balasubramanian, Director, NFTDC, Hyderabad) MS Thesis, IIT Madras, 2009.
30. Sreenivasulu Nagireddy, "A Pattern Recognition Approach to Block Cipher Identification," (Co-guide: Prof. C Chandra Sekhar, Dept. of CS&E), MS Thesis, IIT Madras, 2009.
31. M Kasirajan, "Patram: A unified word processing system for handwritten character recognition in Indian languages," (Co-guide: Prof. Srinivasa Chakravarthy, Dept of BT), MS Thesis, IIT Madras, 2008.
32. P Sreehari Krishnan, "Voice activity detection using group delay functions," M S Thesis, IIT, Madras, 2007.
33. A Lakshmi, "A Syllable-based approach to continuous speech recognition in Indian languages," (Co-guide, Prof. C S Ramalingam, Dept. of EE) M S Thesis, IIT, Madras, 2007.

34. Samuel Thomas, "Natural sounding Text-to-speech synthesis based on syllable-like units," (Co-guide: Prof. C Chandra Sekhar, Dept. of CS&E) M S Thesis, IIT, Madras, 2007.
35. Dinil Mon Divakaran, "Traffic Modeling and Analysis," (Co-guide: Prof. TA Gonsalves, Dept. of CS&E) M S Thesis, IIT, Madras, 2007.
36. P Manohar, "The Multimodal Interaction for the Computer: An Application independent Approach," M.S Thesis, IIT Madras, 2006.
37. Vinod J, "Low cost Data Communication network for Rural Telecom Management," (Co-Guide: Prof. T.A. Gonsalves, Dept. CS&E, IIT Madras) M S Thesis, IIT Madras, 2006.
38. G L Sarada, "Automatic Transcription of Continuous Speech into Syllable-like Units," M.S Thesis, IIT Madras, 2006.
39. Rajesh Hegde, "The Modified Group Delay feature and its application to Speech Recognition," Ph.d Thesis, IIT Madras, 2005.
40. R Deepak, "Distributed Intrusion Detection System," (Co-Guide: Prof. T.A.Gonsalves, Dept. CS&E, IIT Madras), M S Thesis, IIT Madras, 2005.
41. Veena Desai, "Distributed Speech Recognition," (Co-guide: Prof.T A Gonsalves, Dept. of CS&E, IIT Madras), M.S Thesis, IIT Madras, 2005.
42. T. Nagarajan, "Implicit Spoken Language Identification Systems," Ph.d Thesis, IIT Madras, 2004.
43. G.Sirisha, "A DSP Virtual Machine," M S Thesis, IIT Madras, 2004 (Co-Guide: Prof. T.A.Gonsalves, Dept. CS&E, IIT Madras)
44. N Sridhar Krishna, "Multilingual Text-to Speech Synthesis," M S Thesis IIT Madras, 2004 (Co-Guide: Prof. T.A.Gonsalves, Dept. CS&E, IIT Madras)
45. M Balamurugan, "An Access Network Planner," M S Thesis, IIT Madras, 2004 (Co-Guide: Prof. T.A.Gonsalves, Dept. CS&E, IIT Madras)
46. M. A. Saifulla, "A Pattern Matching Approach to Classifying Network Traffic," M.S Thesis, IIT Madras, 2003, (Co-Guide: Prof. T.A.Gonsalves, Dept. of CS&E).
47. V Kamakshi Prasad, "Segmentation and Recognition of Continuous Speech," Ph.D Thesis, IIT Madras, 2002.
48. A Ramasamy, "LP Based Traffic Modelling and a Framework for Control," M.S.Thesis, IIT Madras, 2002 (Co-Guide: Prof.T.A.Gonsalves, Dept. of CS&E).
49. B Jyotsana, "A Spoken Language Identification System for Indian Languages," M.S. Thesis, IIT Madras, 2001.
50. S Vela, "A New Model of Speaker Identification based on Statistical Similarity and an Object Oriented Framework for Online Speaker Identification," M.S.Thesis, IIT Madras, 1999.
51. J Srichand, "Word Boundary Detection in Indian Languages and its Application to Keyword Spotting," M.S.Thesis, IIT Madras, 1999 (Co-guide:Prof.G.V.Ramana Rao).

52. M Narendranath, "Transformation of Vocal Tract Characteristics for Voice Conversion using Artificial Neural Networks," M.S. Thesis, IIT Madras, 1995 (Co-Guide: Prof.B.Yegnanarayana, Dept. of CS&E).

Research Scholars (Current):

1. Anusha Prakash (PhD) *Area: Speech Technology* (0.5 year) (EE Dept, co-guide: Umesh S)
2. Rini Evangelina Anand (PhD) *Area: Computational Brain Research* (2 years) (EE Dept, co-guide: Umesh S)
3. Siddharth Agarwal (MS) *Area: Computational Brain Research* (0.5 year)
4. M Srihari (MS) *Area: Computational Brain Research* (1 year)
5. Venkatasubramanian Veeraraghavan (PhD) *Area: Music Analysis* (1.5 year) (EE Dept, co-guide: R Aravind)
6. Jeena Prakash (PhD) *Area: Speech Synthesis* (4.5 years)
7. Jilt Sebastian (PhD) *Area: Speech and Music Signal Processing* (4 years)
8. Jom Kuriacose (PhD) *Area Music information retrieval* (4 years)
9. Karthik Pandia (Phd) *Area: Keyword spotting* (4 years)
10. M S Saranya (Phd) *Area: Speaker Recognition* (3 years)
11. Arun Baby (MS) *Area: Speech Synthesis* (3 year)
12. Manish Jain (MS) *Area: Language Identification* (4 years)
13. Krishna Raj P V (MS) *Area: Music information retrieval* (2.5 years)
14. Mari Ganesh (PhD) *Area: Computational Brain Research* (2 years)

M. Tech Students (Completed):

1. Ambika Devi Amma T., *A Multilingual Speech Oriented Learning System for the Hearing Impaired*, M.Tech Thesis, IIT Madras, 1994.
2. Anurag Dave, *Curve Based Font Generation of Indian Languages*, M.Tech Thesis, IIT Madras, 1995.
3. Suriyan Narayanan R, *Devanagari Script Processor and Image Handler*, M.Tech Thesis, IIT Madras, 1995.
4. J Radha, *Distributed Orchestrated Multimedia Presentation*, M.Tech Thesis, IIT Madras, 1995.
5. S. Jagadish, *Surface Reconstruction from Planar Contours Extracted From MRI Images*, M Tech Thesis, IIT Madras, 1998 (Co-Guide: Sukhendu Das, Dept. of CS&E, IIT Madras).
6. Ravindranathan K R, *Unsupervised Texture Segmentation Using Gabor Filters*, M Tech Thesis, IIT Madras, 1998 (Co-Guide: Sukhendu Das, Dept. of CS&E, IIT Madras).

7. S B Herlekar, *Speaker Independent Data Collection of a) Connected Digit Database, (b) Acoustic Phonetic Corpus for Continuous Speech*, M Tech Thesis, IIT Madras, 1998.
8. Sai Arul, *Rendering of Surfaces by Texture Mapping*, M Tech Thesis, IIT Madras, 1998.
9. M Ravi Kumar, *Combining Solids Using Boolean Operations*, M Tech Thesis, IIT Madras, 1998.
10. G Sriram, *A New Approach to Fractal Image Compression based on Enveloped Domain Search*, M Tech Thesis, IIT Madras, 1998.
11. Hanumandla Sreedhar, *Block based Fractal Image Compression: An Adaptive Enveloped Domain Search*, M Tech Thesis, IIT Madras, 1999 (Co-Guide:Prof.R.Aravind, Dept. of EE, IIT Madras).
12. M Ramkoteswara Rao, *Solid Modeling Using Regularised Boolean Expressions: A Voxel Based Approach*, M Tech Thesis, IIT Madras, 1999.
13. Jyoti Prakash Kurmi, *ML_Solsh - A Visual Aid for the Hearing Impaired*, M Tech Thesis, IIT Madras, 1999.
14. Rajesh Kumar, *WebSpeak: A Web Browser for the Visually Impaired*, M Tech Thesis, IIT Madras, 1999.
15. D. Rajanikanth, *Design of Agent Software for Network Monitoring and Control*, M Tech Thesis, IIT Madras, 2000.
16. S G Anand, *Enhancement of Network QoS Support and Traffic Control in Linux*, M Tech Thesis, IIT Madras, 2000.
17. Ashok Kumar, *Speaker-Independent Client Server based Web Browser for the Visually Impaired*, M Tech Thesis, IIT Madras, 2000.
18. Ajay Arora, *Performance Evaluation of IITM Campus Network Using CygNet*, M Tech Thesis, IIT Madras, 2001.
19. G T Nadiyan Selvam, *DSP Virtual Machine: VML to Target Translator*, M Tech Thesis, IIT Madras, 2001.
20. Saraph A P, *DSP Virtual Machine: VML to VML Optimisation*, M Tech Thesis, IIT Madras, 2001.
21. V S Shenoi, *X Window based Indian Language Support for Linux Operating System*, M Tech Thesis, IIT Madras, 2001.
22. K Ratheesh *Console based Indian Language Support for Linux Operating System*, M Tech Thesis, IIT Madras, 2001.
23. Sanghamitra Biswas *Indian Language Interface to Database for Linux Operating System*, M Tech Thesis, IIT Madras, 2002 (Co-Guide: T A Gonsalves, Dept. of CS&E, IIT Madras).
24. Anup Banskota, *SpreadSheet Implementation with Multilanguage Support*, M Tech Thesis, IIT Madras, 2002 (Co-Guide: T A Gonsalves, Dept. of CS&E, IIT Madras).
25. M Backialakshmi, *PRI Interleaving Using VML*, M Tech Thesis, IIT Madras, 2002 (Co-Guide: K B Venkaratraman, DARE, DRDO, Bangalore).

26. N Raghu Kishore *CODEC Application in DSP Virtual Machine Language* M Tech Thesis, IIT Madras, 2002 (Co-Guide: T A Gonsalves, Dept. of CS&E, IIT Madras).
27. P Saravanan, *DSPVM Simulator*, M Tech Thesis, IIT Madras, 2002 (Co-Guide: T A Gonsalves, Dept. of CS&E, IIT Madras).
28. M Mahesh *Digital Signal Processor Virtual Machine Input-Output*, M Tech Thesis, IIT Madras, 2002 (Co-Guide: T A Gonsalves, Dept. of CS&E, IIT Madras).
29. K Geetha, *Graphical User Interface Development for DSP Virtual Machine*, M Tech Thesis, IIT Madras, 2002 (Co-Guide: T A Gonsalves, Dept. of CS&E, IIT Madras).
30. Dukman, *Ping based Network Management System*, M Tech Thesis, IIT Madras, 2002 (Co-Guide: T A Gonsalves, Dept. of CS&E, IIT Madras).
31. Anitha Nalluri, *Convertor Across Different Indian Languages and Fonts*, M Tech Thesis, IIT Madras, 2003.
32. Adinarayana Gupta, *Blackfin Assembly Translator for ADSP 218X DSP Processor*, M Tech Thesis, IIT Madras, 2003 (Co-Guides: C S Ramalingam, Dept. EE, IIT Madras, Srinivas K, Analog Devices, Pvt. Ltd., Bangalore).
33. Subodh Gupta, *Network Traffic Analysis Using Linear Prediction*, M Tech Thesis, IIT Madras, 2004.
34. Ch. V Phani Kumar, *Network Security Scanning*, M Tech Thesis, IIT Madras, 2004.
35. M Krishna Kumar, *Communication and Control Software for an Automated Teller Machine*, M Tech Thesis, IIT Madras, 2004.
36. Deepak Agarwal, *Gaussian Mixture Models and Network Traffic Analysis*, M Tech Thesis, IIT Madras, 2004.
37. K Nagendra Prasad, *TMS320C54x to ADSP-21535 Program Translator*, M Tech Thesis, IIT Madras, 2004.
38. K Santosh *C to VML Translator*, M Tech Thesis, IIT Madras, 2005.
39. Sita Reddy *DSR using PO/PR protocol and measuring the QoS characteristics*, M Tech Thesis, IIT Madras, 2005.
40. P Devi *Client side implementation of distributed speech recognition on an embedded device*, M Tech Thesis, IIT Madras, 2005.
41. Sandhya Reddy *Detection of anomalous network traffic*, M Tech Thesis, IIT Madras, 2005.
42. Shameem Unnisa *Multilingual search engine interfaced with Morph analyzer*, M Tech Thesis, IIT Madras, 2005.
43. Amit Dangwal *Tool for organising data associated with online tutorials*, M Tech Thesis, IIT Madras, 2005
44. Vikas Luthra, *Implementing online teaching-learning strategies in interactive education*, M Tech Thesis, IIT Madras, 2005

45. Vijay Katoch, *Speech Synthesis in Spoken English Tool Kit*, M Tech Thesis, IIT Madras, 2006.
46. G Bhaskar, *Spoken English Tool kit*, M Tech Thesis, IIT Madras, 2006.
47. G Philip, *Grammar models for Spoken English Tool Kit*, M Tech Thesis, IIT Madras, 2006.
48. Dhananjaya, *Traffic Analysis and Modeling*, M Tech Thesis, IIT Madras, 2007.
49. J P Nirmala, *Multilingual Domain Name System for Indian Languages*, M Tech Thesis, IIT Madras, 2008.
50. Bhulakshmi, *Transliteration and Translation of web pages into Indian languages*, M Tech Thesis, IIT Madras, 2008.
51. D Swathi, *Analysis of Carnatic music: A signal processing perspective*, M Tech Thesis, IIT Madras, 2009.
52. Ankit Malpani *Personalised intelligent tutoring system*, M Tech Thesis, IIT Madras, 2009 (Co-guide: Prof. B Ravindran, Dept. of CS&E).
53. M Bhuvaneshwari *A framework for online subjective examinations*, M Tech Thesis, IIT Madras, 2010.
54. Jeena J Prakash, *Internet Traffic Analysis and Modeling of IITM Network*, M Tech Thesis, IIT Madras, 2010.
55. Glisa, *An Algorithm for Controlling IITM Network Traffic*, M Tech Thesis, IIT Madras, 2010.
56. Rahul, *Design of an SMS Lexicon for an Indian Language*, M Tech Thesis, IIT Madras, 2010.
57. M Sandeep Kumar, *Network User Behavior Modelling : Classifying User Behavior* M Tech Thesis, IIT Madras, 2011.
58. Raman Konna, *User Based Bandwidth Management Over Internet Access Link Using TCP Rate Control* M Tech Thesis, IIT Madras, 2011.
59. Subash Midhila, *Energy Aware Networking: Reducing Energy Consumption in Backbone Networks by turning off Under-Utilized Links*, M Tech Thesis, IIT Madras, 2011.
60. Anil Kumar, *Web Data classification using supervised feature extraction techniques*, M Tech Thesis, IIT Madras, 2011.
61. Arunkumar B, *Port-based Anomaly Detection in Network Traffic*, M Tech Thesis, IIT Madras, 2011.
62. Jyosna Chandu, *Dynamic Question Generation for Geometry in TeNeT Online TT Examination System*, M Tech Thesis, IIT Madras, 2011.
63. Kalpana Raman *Multilabel Classification of Web Documents Using Latent Semantic Analysis*, M Tech Thesis, IIT Madras, 2011.
64. Nikhil Sharma M, *Low-Rate DOS Attacks & Detection Mechanisms*, M Tech Thesis, IIT Madras, 2011.
65. Parth Joshi, *A study of multimodal video classification*, M Tech Thesis, IIT Madras, 2015.

66. G K Sudharshan, *Video event localization and identification*, M Tech Thesis, IIT Madras, 2015.
67. Abil N G, *Deep neural network toolkit and event spotting in video using DNN features*, IIT Madras 2015.
68. P A Manoj Kumar, *High resolution property of group delay functions its application to musical onset detection on Carnatic percussion instruments*, IIT Madras, 2015.
69. Ankit Vaidya, *Personalised recommender system for bollywood music*, IIT Madras, 2016.
70. Jyotsna Thapliyal, *Human action recognition using dense trajectories*, IIT Madras, 2016.
71. Padmasundari, *Music information retrieval: Raga identification using machine learning*, IIT Madras, 2016.
72. Y S Sreekar, *Machine learning and signal processing in computational neuroscience*, IIT Madras, 2016.
73. Athul Vijayan, *Motivic analysis of neuronal responses to visual stimuli*, IIT Madras, 2016.
74. Shantanu Gupta, *A Study of the Signal Processing Mechanisms in the Mouse Primary Visual Cortex*, IIT Madras, 2016.
75. Swetha Tanamala, *A Semi-Automatic Method for Transcription Error Correction for Indian Language TTS Systems*, IIT Madras, 2017.
76. Dheer Prashant Jain, *A Query by Example Spoken Term Detection System*, IIT Madras, 2017.
77. Poonam Thapar, *Feature based Stimulus Classification and Determining Receptive field of Visual Cortex Neurons*, IIT Madras, 2017.
78. Hardik Suthar, *Analysis of Visual Area Responses of Mice Using Machine Learning*, IIT Madras, 2017.
79. Sidharth Bafna, *Analysis and Modeling Neuronal Responses using Machine Learning*, IIT Madras, 2017.
80. Sakshi Verma, *Discovering Language in Marmoset Vocalization*, IIT Madras, 2017.
81. K L Prateek, *Speaker Diarization System for Meeting Data and Marmoset Vocalizations*, IIT Madras, 2017.
82. Krishna Chaitanya Gogineni, *PERCUSSION ARTIST IDENTIFICATION*, IIT Madras, 2017.
83. Aadhirai R, *Classification and Clustering of Visual Cortex Areas of Mouse Brain*, IIT Madras, 2017.

(G) Awards:

- Elected as a “Fellow of the Indian National Academy of Engineering,” Nov 2017.
- Elected to the board of the International Speech Communication Association (2017-2021).
- Manthan award (top 74 finalists), 2012.

- Indian Language text-to-speech synthesis systems integrated with screen readers, GE innovation award and first prize in research expo, Shaasthraa 2012.
- Prof. Rais Ahmed Memorial Lecture Award, Acoustical Society of India, 2012.
- IBM Faculty award, 2006.

(H) Technology Transfers:

1. Speaker Verification Software – Tata Power Corporation
2. SMS to Speech – DeitY, available as a freely downloadable app for 5 Indian languages
3. Indian language screen readers for Android – CDAC, DeitY
4. Indian language Screen readers for visually challenged – CDAC, DeitY, visually challenged community
5. Soft computing tools for decrypting messages – SAG, DRDO
6. Cygplan – Access Network Planner – Midas Technologies
7. Online Test and Tutorial – n-Logue Communications, Samvitt
8. DSP virtual machine – DACS, Bangalore
9. Launch and transfer (to OS Labs) of 9 language TTS technology by Hon'ble Minister of IT on Dec 28th 2015 as part of "good governance day."

(I) Projects:

Sponsored Projects:

1. Project Title: Integration of 13 Indian language TTS systems with screenreaders for Windows, Linux and Android platforms

Coordinators: Hema A Murthy, C Chandra Sekhar, S Umesh
 Budget : 60 lakhs
 Duration : April 2018 -- March 2019.
 Sponsor : MeitY, GoI

Project Title: Development of text/language independent speaker recognition, Language identification and keyword spotting system for passive interception systems in adverse environments

Coordinators : Hema A Murthy, C Chandra Sekhar, S Umesh
 Total : 110 lakhs
 Duration : Sept 2013- Nov 2016.
 Sponsor : DRDO, India.

2. Project Title: Sched-Wireless (IUATC Project Phase II) Group 2
 Coordinators : S Krishnamoorthy Sivalingam, Gaurav Raina,
 Hema A Murthy, Devendra Jalihal.
 Total : 1.28 crores
 Duration : Nov 2012 -- March 2015
 Sponsor : DST, India

3. Project Title: Development of TEXT to SPEECH SYSTEM in Indian Languages: High quality text to speech synthesis and small footprint TTS (A twelve institute consortium effort) integrated with disability aids
 Coordinators : Hema A Murthy (Consortium lead)
 Total : 12.66 crores (consortium -- IIT Madras: 2.09 crores)
 Duration : April'2012-Sept 2016.
 Sponsor : DIT, India.
4. Project Title: Provision of services in the performance of the task described within the framework of the CompMusic European Project for the Analysis of the traditional Carnatic style of Music from India (4 Institute consortium project)
 Coordinator : Hema A Murthy
 Total : 125000 Euros
 Duration : Aug 1, 2011-July 31 2016
 Sponsor : University of Pompea Fabra, Spain
5. Project Title: Development of text to speech system for Indian languages (A six Institute Consortium effort)
 Coordinators : Hema A Murthy (Consortium lead)
 Total : 2.28 crores
 Duration : April'2009-Dec'2011.
 Sponsor : DIT, India.
6. Project Title :Text Transcription of Technical Video Lectures and Creation of Searchable Video Index, Metadata and Online Quizzes
 Coordinators : Mangala Sunder and Hema A Murthy
 Total : 3.45 crores
 Duration : Dec'2006-Dec' 2012
7. Project Title: IUATC Theme 4: Network security and resilience in NGNs
 Coordinators : T A Gonsavles, Hema A Murthy
 Total : 1 crore
 Duration : Oct 2009 - April 2012.
8. Project Title: DRDO MoC: Academic and research in communication and information technologies research program
 Coordinators : T A Gonsalves, Hema A Murthy, V Kamakoti
 Total : 2 crores
 Duration : June 2008 - Oct 2013.
 Sponsor : DRDO, India
9. Project Title: Automatic speech recognition for agricultural commodity prices in Indian languages (a consortium effort)
 Coordinators : S Umesh (Consortium lead), Hema A Murthy, C S Ramalingam, C Chandra Sekhar
 Total : 4.35 crores
 Duration : April 2010 - Mar 2012.

- Sponsor : DIT, India.
10. Project Title: Microsoft Windows Technologies Lab
 Coordinators : T A Gonsalves, V Kamakoti, B Ravindran
 Hema A Murthy, Ashok Jhunjunwala,
 Devendra Jalihal
 Total : 93 lakhs
 Duration : Jun'2006-March 2012.
11. Project Title: Basic computers for visually challenged
 Coordinators : Hema A Murthy
 Total : 2.59 lakhs
 Sponsor : RUTAG, IIT Madras.
12. Project Title: Speech Synthesis in Indian Languages
 Coordinators : Hema A Murthy
 Total : 4.47 lakhs
 Duration : Dec'2006-Dec' 2008
13.
 Project Title: Soft Computing methods for Cipher System identification and key transformation
 Coordinators : C Chandra Sekhar and Hema A Murthy
 Total : 10 lakhs
 Duration : Sept'2005-Nov'2007
 Sponsor : DRDO
14. Project Title: Clustering techniques for key space reduction
 Coordinators : C Chandra Sekhar and Hema A Murthy
 Total : 5.88 lakhs
 Duration : Sept'2006-Nov'2007
 Sponsor : DRDO
15. Project Title:A Multimodal Interface Enabled Office Suite
 Coordinators : C S Ramlingam, Hema A Murthy, Srinivasa
 Chakravarthy, C Chandra Sekhar
 Total : 49 lakhs
 Duration : April'2005-Oct'2008
 Sponsor : Department of Science and Technology
16. Project Title: Communication Technology: Internal Development and Research Project
 Coordinators : Ashok Jhunjunwala, Hari Ramachandran,
 Hema A Murthy, C S Ramalingam
 Total : 60 lakhs
 Duration : Oct'2004-Sep'2007
 Sponsor : IIT Madras
17. Project Title: Translator across DSP Processors
 Total : Rs. 6 lakhs
 Coordinators : Hema A Murthy and Timothy A Gonsalves

- Duration : Aug'2003-July'2006.
Sponsor : IsoftTech Software Solutions Private Limited
18. Project Title : Advanced Network Management Systems
Total :Rs.20 lakhs
Coordinators : Prof.Timothy A.Gonsalves, Hema A Murthy,
Prof.Ashok Jhunjunwala
Sponsor : NMSWorks, Madras
Duration : 8/2002-1/2009
19. Project Title : Network Management Software for NIOT Campus
Total : Rs.75,000/-
Coordinators : Dr.Hema A.Murthy, Prof.Timothy A.Gonsalves,
Prof.Ashok Jhunjunwala
Sponsor : NIOT, Madras
Duration : 8/99-11/2000
20. Project Title : Voice Conversion
Total : Rs.8.8 lakhs
Coordinators : Prof.B.Yegnanarayana, Hema A Murthy,
C Chandra Sekhar
Sponsor : DST
Duration : 1992-1995.
21. Project Title : Algorithms for Signal Reconstruction in
Acoustic Imaging
Total : Rs.9.741 lakhs
Coordinators : Prof.B.Yegnanarayana, Hema A Murthy
Sponsor : Department of Electronics
Duration : 1989-1991.

RBIC Projects:

1. Project Title: Speaker Identification (Phase II)
Coordinators : Hema A Murthy
Total : 15 lakhs
Duration : Jan 2010 - May 2013.
Sponsor : Tata Power Corporation (Strategic Elect. Division)
2. Project Title: Speaker Identification (Phase I)
Coordinators : Hema A Murthy and C Chandra Sekhar
Total : 9.96 lakhs
Duration : Nov'2007 - Jan 2010.
Sponsor : Tata Power Corporation (Strategic Elect. Division)
3. Project Title : Development of Software Tools for DSP Platforms
Total : 7.71 lakhs
Coordinators : C Chandra Sekhar
Hema A Murthy
Duration : Oct 1999 - Sept 2000.
Sponsor : DACS, Bangalore.

4. Project Title: Studies in Language Identification
 - Total :Rs.3.71 lakhs
 - Coordinators : Dr.Hema A Murthy
 - Duration : Jan. 2001, Dec. 2002
 - Sponsor : DACS, Bangalore.

5. Project Title: CygNet - Integrated Network Management System
 - Total: Rs.20 lakhs
 - Coordinators : Hema A Murthy, Ashok Jhunjunwala
 - Duration : Two years (2000-2002)
 - Sponsor : Polaris Software, Nilgiri Networks Pvt. Ltd.

6. Project Title: CygPlan - Integrated Access Network Planner
 - Total : Rs.2 lakh
 - Coordinators : Hema A Murthy, Ashok Jhunjunwala
 - Duration : Two years (2000-2002)
 - Sponsor : Nilgiri Networks Pvt. Ltd.

7. Project Title: Wireless in Local Loop
 - Coordinators : Bhaskar Ramamurthi, T A Gonsalves, Ashok Jhunjunwala, Hema A Murthy, C Mathialagan
 - Total : Rs 9 crores
 - Duration : Mar'94-Mar'03 (I was a coinvestigator from 1999-Mar'2003.)

8. Project Title: Direct Internet Access System
 - Coordinators : Ashok Jhunjunwala, Bhaskar Ramamurthi, T A Gonsalves, Devendra Jalihal, R Arvind, Hema A Murthy (I was a coinvestigator until Mar'2003).
 - Total : Rs. 5 lakhs
 - Duration : 2001-2005.
 - Sponsor : Banyan Networks

9. Project Title: Ventureast TeNeT Fund
 - Coordinators : Ashok Jhunjunwala, Bhaskar Ramamurthi, T A Gonsalves, Hema A Murthy, Devendra Jalihal, R Arvind, T G Venkatesh, A N Rajagopalan
 - Total : 2.4 lakhs
 - Duration : (2002-2006) 4 years

10. Project Title: Digital Internet Access Server
 - Coordinators : Ashok Jhunjunwala, Bhaskar Ramamurthi, T A Gonsalves, Hema A Murthy
 - Total : 65.0 lakhs
 - Duration : Dec'2001-Mar'2003
 - Sponsor : HFCL, HTL, ARM, Shyam and Banyan