

CURRICULUM VITAE



1. Name : **Dr.N.K.NARAYANAN**

2. Present position : **Principal**

3. Postaladdress :
(Office): **College of Engineering
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4. E-mail Address : **nk narayanan@gmail.com**

5. Phone Number
(Office) : **0496 2536125, 0496 2537225**
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6. Date of Birth : **04-10-1956**

7. Qualification : **Ph.D(Technology)., Cochin University of Science & Technology, 1990**

8. Research Interest: **Computer vision, Speech & Language understanding, Biomedical signal processing, Bioinformatics, and Big data analytics**

9. Experience

(a) Academic experience : **35+ years teaching/research experience**

Post held	Organization	Duration		Experience (In Years and Months)
		From (Date)	To (Date)	
Principal	College of Engineering Vadakara	17/6/2017	Till date	
Professor in Computer Science & Engineering	IIIT, Kottayam	31/5/2017	16/6/2017	
Professor in Information Technology	Kannur University	26/6/2003	31/3/2017	13 years and 9months
Associate Professor or Equivalent	Kannur University/ Govt. Colleges, Kerala	14/12/1994	25/6/2003	8 years and 6 months
Assistant Professor or Equivalent	Govt. Colleges, Kerala	14/12/1981	13/12/1994	13 Years

(b) Administrative experience :10 + years administrativeexperience

Sl. No.	Post held	Organisation/University	Duration		Experience In years and months
			From	To	
1	Principal	College of Engineering Vadakara	17/6/2017	Till date	
1	Head of the Department	Department of Information Technology, Kannur University	19/2/2003	31/3/2008	5 years and 1 month
2	Principal (on deputation)	College of Engineering Vadakara	1/4/2008	31/3/2010	2 years
3	Head of the Department i/c	Department of Statistics, Kannur University	17/7/2010	27/4/2012	1 year and 9 months
4	Director	UGC Academic Staff College, Kannur University	28/4/2012	1/2/2014	1 year and 9 months

(c) Other Academic responsibilities held

Sl. No.	Academic responsibilities held	Organisation/University	Duration		Experience (In years)
			From	From	
1	Chairman, Board of Studies	Board of Studies in Computer Science, Kannur University	2003	2012	about 10 years
2	Member, Board of Studies	Board of Studies in Computer Science, Kannur University	2003	Till date	about 14 years
3	Member, Board of Studies	Board of Studies in Computer Applications, CUSAT	2010	Till date	about 6 years
4	Member, Board of Studies	Board of Studies in Computer Science, University of Calicut	2008	2014	about 6 years
5	Member, Board of Studies	Board of Studies in Physics University of Calicut	2002	2003	about t 2 years
6	Member, Academic Council	Academic Council, Kannur University	2003	2008	about 5 years
7	Member of Senate	Senate, Kannur University	2003	2008	about 5 years
8	Member of Faculty	Faculty of Technology, Kannur University	2014	Till date	about 3 years
9	Member of Faculty	Faculty of Technology, CUSAT	2013	Till date	about 4 years
10	Member of Faculty	Faculty of Science, University of Calicut	2011	2014	about 3 years
11	Member, Board of Governors	TEQUIP, College of Engineering, Vatakara	2013	Till date	about 4 years
12	Member, Board of Management	UGC EMRC, Anna University, Chennai	2014	Till date	about 3 years
13	Director	IQAC, Kannur University	2010	2013	about 3 years
14	Director	UGC Computer Centre, Kannur University	2006	2008	about 2 years
15	Director	IT Education Centre, Kannur University	2003	2008	about 5 years
16	Member of Professional/ Academic Bodies	Life Member, Acoustical Society of India	1986	Till date	about 30 years

10. Awards / Recognitions

1. **Fellow, Acoustical Society of India (ASI)**
2. **UGC CEC Member - Board of Management, UGC EMRC, Anna University, Chennai**
3. **UGC Teacher Fellowship award in 1985-88**
4. **Invited to – The 18th World Multi-conference on Systemics, Cybernetics and Informatics, WMSCI 2014 at Orlando, Florida, USA**
5. **Invited to – The International Conference on Computer, Electrical, Systems Science and Engineering, ICCESSE 2010, Paris, FRANCE**

11. Number of Ph.D guided (Completed / inProgress) : **completed – 10, in progress –3**

Details of Research Thesis/Scholars successfully guided

Sl No	Year of award	Title of Thesis	Name and present carrier of scholar
1	2017 (submitted)	Detection and Analysis of Human Face Images Altered by Disguise for Computer Recognition	Jayasree M, Assistant Professor, Dept. of Computer Science & Engg, Govt. College of Engineering, Trichur
2	2017 (submitted)	Brain Dynamics Under Mobile Phone radiation	Smitha C.K, Associate Professor Dept of Electronics Engineering, College of Engineering, Vadakara
3	2017	Enhanced Malayalam Speech Recognition Using Multimodal Techniques	N.S. Sreekanth, Principal Technical Officer, Centre for Development in Advanced Computing, CDAC, Bangalore
4	2017	Sequence analysis and Gene prediction using Pattern Recognition Algorithms For Oryza Sativa Indica	Hemalatha N, Assistant Professor in Computer Science, St. Aloysius Collge, Mangalore
5	2016	A New Active Noise Control System With Secondary Path Modeling and Its Application for Speech Communication in Noisy Environment	Sivadasan K, Associate Professor in Electronics Engg, Yambu Industrial College, Saudi Arabia
6	2013	Computer Recognition of V/CV Speech Units based on Linear and Non-Linear Dynamical System Models using Brain Like Computing and Statistical Learning Algorithms.	Thasleema T M, Assistant Professor in Computer science, Central University of Kerala
7	2010	Computer Recognition of Human Face Image using Nonlinear Dynamical System and Wavelet Based Artificial Light Receptor Models.	Kabeer V, Assistant Professor in Computer science, Farook College
8	2008	Investigations on the application of Dynamical Instabilities and Deterministic Chaos for Speech Signal Processing.	Prajith P, Senior HSST, Directorate of Higher Secondary Education, Kerala

9	2007	Adaptive Neuro - fuzzy Inference based Pattern Recognition Studies on Handwritten Character Images.	Lajish V L, Assistant Professor in Computer science, University of Calicut
10	2002	Vowel Phoneme Recognition from Zero crossing based Parameters using Artificial Neural Networks.	R K Sunil Kumar, Assistant Professor, Collegiate Education, Kerala

12. Number of Patents filed : 3

Details of Patents Filed

1. Indian Patent Docket No. 32040/Ref.No. 5296/CHE/2015, Date 05/10/2015
2. Indian Patent Docket No. 32041/ Ref.No. 5297/CHE/2015, Date 05/10/2015
3. Indian Patent Docket No. 1622/ Ref.No. 201641001632, Date 16/01/2016

13. Number of Publications (National /International) : Total - 152, National – 72, International - 80

(a) Publications/Contributions in academic journals

No	Date	Title	Name of Journal
1	2017	Audio Visual Technique for Enhancing the Isolated Word Speech Recognition System	International Journal of Advanced Research in Computer Science, Volume 8, No. 3, March – April 2017, pp.884-888. ISSN No. 0976-5697
2	2017	Static Hand Gesture Recognition using Mono Vision Based Techniques	International Journal of Innovative Computer Science & Engineering, Volume 4 Issue 2; March-April-2017; pp 33-41, ISSN: 2393-8528
3	2017	An Enhanced Mixed Noise Removal Technique for Color Images Using Fuzzy Logic	International Journal of Innovative Computer Science & Engineering Volume 4 Issue 1; January-February-2017; Page No. 21-28, ISSN: 2393-8528
4	2017	An Enhanced Two-Pass Classifier for Face Recognition Using Back-Propagation Neural Networks and Support Vector Machines	International Journal of Innovative Computer Science & Engineering Volume 4 Issue 1; January-February-2017; Page No. 10-17, ISSN: 2393-8528
5	2016	Computation of Successive Absorption Rate in Brain using simulation of Electromagnetic Radiation - FDTD Method	International Journal of Research in Engineering and Technology, Vol.5, Issue 19, pp.29-34, ISSN 2319-1163
6	2016	Increase in Specific Absorption Rate (SAR) of Mobile Phone - A Threat to Human	International Research Journal of Electronics and Computer Engineering, Vol 2(2), ISSN: 2412-4370
7	2016	A Review of Feature Extraction Methods in Content Based Image Retrieval	International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering (IJIREEICE)- Vol 3, pp96-99, DOI 10.17148
8	2015	An Improved ANC System with Application to Speech Communication in Noisy Environment	Signal & Image Processing : An International Journal (SIPIJ) Vol.6, No.4, pp47-56, , DOI : 10.5121/sipij.2015.6404
9	2015	Wavelet Energy based Statistical Learning Approaches to Voiced /	International Journal of Scientific and Engineering Research (IJSER), Vol. 6, No. 1, pp. 18 – 22

		Consonant Recognition	
10	2015	Key-frame extraction by analysis of histograms of video frames using statistical methods	Procedia Computer Science, Volume 70, Pages 36-40.doi: 10.1016, 2015
11	2014	Effects of Mobile Phone Radiation on Brain Using Statistical Parameters and Its Derivatives	International Journal of Innovative Research in Computer and Commn. Engineering, Vol.2 Issue 5,pp 326-331, ISSN(O): 2320-9801 ISSN (P): 2320-9798, 2014
12	2014	Brain Dynamics under Mobile Phone Radiation Using Various Fractal Dimension Methods	International Journal of Imaging and Robotics, Volume 13, Issue Number 2, pp 166-180, (ISSN: 2231-525X), 2014
13	2013	A New Online Secondary Path Modeling for Feed Forward ANC System	International Journal of Electronics Letters, Taylor & Francis, U.K, Nov 2013
14	2013	Machine Learning Approaches for Prediction of Expansion Gene Family in <i>IndicaRice</i>	Agricultural Research, Springer-verlag, vol 2(4), pp 309-318, (ISSN: 2249-7218)
15	2013	Computational approach for the prediction of ERF and DREB proteins in indica rice using SVM	ORYZA, An International Journal on Rice, vol. 49(4), pp. 239-245, (ISSN :2249-5266), 2013
16	2013	Effect of Mobile Phone Radiation on EEG Using Various Fractal Dimension Methods	International Journal of Advancements in Research & Technology(IJOART),Vol.2(5) ISSN 2278-7763 2013.
17	2013	Modeling and Recognition of Consonant – Vowel units using Statistical Learning Algorithms	<i>J.Acous.Soc.Ind (JASI)</i> , Vol. 40(3), pp. 156 – 164, ISSN – 0973 – 3302, Acoustical Society of India, 2013.
18	2013	An integrative system for Prediction of NAC proteins in rice using different feature extraction methods	<i>International Journal on Soft Computing (IJSCC)</i> , Vol. 4(1), pp. 9-21, ISSN - 2229-6735, AIRCC, 2013
19	2013	Consonant Classification using Decision Directed Acyclic Graph Support Vector Machine Algorithm	<i>International Journal of Signal Processing, Image Processing and Pattern Recognition (IJSIP)</i> , Vol. 6(1), pp. 59 – 74, ISSN- 2005-4254,SERSC,Australia, 2013.
20	2012	Wavelet Hybrid Feature for Malayalam CV Speech Unit Recognition using Artificial Neural Networks	<i>J.Acous.Soc.Ind (JASI)</i> , Vol. 39(4), pp. 181 – 185, ISSN – 0973 – 3302, Acoustical Society of India, 2012.
21	2012	Time-Domain Nonlinear Feature Parameter for Consonant Classification	<i>International Journal of Speech Technology, (IJST)</i> , Vol. 15(2), pp. 227 – 239, ISSN 1381-2416, Springer –2012
22	2012	Genome-wide Analysis of Putative ERF and DREB Gene Families in Indica Rice (o. Sativa l. Subsp. Indica)	<i>International Journal of Machine Learning and Computing (IJMLC)</i> , Vol. 2(5), pp. 556-559, ISSN 2010-3700, IACSIT – USA, 2012
23	2012	“Multi Resolution Analysis for Consonant Classification in Noisy Environments”,	<i>International Journal of Image, Graphics and Signal Processing(IJIGSP)</i> , Vol. 4(8), pp. 15 – 23, ISSN-2074-9074, MECS -Hong Kong, 2012.
24	2012	“ANC System for Noisy Speech”	<i>Signal and Image Processing: An International Journal (SIPIJ)</i> , Vol. 3(3), pp. 93 –101, ISSN - 2229

			– 3922, AIRCC , 2012
25	2012	“Reconstructed State Space Model for Recognition of Consonant – Vowel (CV) utterances using Support Vector Machines”	<i>International Journal of Artificial Intelligence and Applications (IJAIA)</i> , Vol. 3(2), pp. 101 – 119, ISSN – 0976-2191, AIRCC – India, 2012
26	2011	“Gesture Based Desktop Interaction”	<i>International Journal of Machine Intelligence (IJMI)</i> , Vol. 3(4), pp. 268 – 271, ISSN 0975-2927, BioInfo Publication – India, 2011
27	2011	“Genome-Wide Analysis and Identification of Genes Related to Expansion Gene Family in Indica Rice”	<i>International Journal for Bioinformatics Research & Applications (IJBRA)</i> , Vol. 7(2), pp. 162 – 167, ISSN – 1744 -5485, Inderscience publisher – USA, 2011.
28	2010	“Face Recognition Using Nonlinear Feature Parameter and Artificial Neural Network”,	<i>International Journal of Computational Intelligent Systems (IJCIS)</i> , Vol. 3(5), pp. 566 – 574, ISSN – 1875-6891, Atlantis Press – Netherlands, 2010.
29	2010	“A new biologically inspired pattern recognition approach for face recognition”	<i>Journal of World Academy of Science, Engineering and Technology</i> , Vol. 67(68), pp. 776-782, ISSN - 2010-376X, WASET, Paris,,FRANCE,2010.
30	2010	“Adaptive filters and Its Applications”	<i>MES Journal of Technology and Management</i> , Vol2(1), ISSN–0976-3724, India, 2010.
31	2010	“Consonant Speech recognition based on Linear Predictive Coding Parameters and k-NN algorithm”,	<i>J.Acous.Soc.Ind (JASI)</i> , Vol. 37(3), pp. 139 – 142, ISSN – 0973 – 3302, Acoustical Society of India, 2010.
32	2009	“Wavelet Based Artificial Light Receptor Model for Human face Recognition”	<i>International Journal of Wavelets, Multiresolution and Information Processing (IJWMIP)</i> , Vol. 7(5), pp. 617-627, ISSN - 0219 - 6913, World Scientific – USA, 2009,
33	2009	“Multimodal Interface: Fusion of various modalities”	<i>International Journal of Information Studies (IJIS)</i> , Vol. 1(2), pp 131-137, ISSN - 1911-8408, Digital Information Research Foundation – CANADA, 2009.
34	2009	“Nonlinear Parameter for ANN based face recognition”	<i>Journal of Intelligent Computing and Applications, (JICA)</i> , Vol. 2 (2), pp. 97-109, ISSN-0974–410X, INDIA,2009.
35	2009	“The Technique of Active Noise Control”	EFY , Vol. 40(6), pp 38-46, India, 2009
36	2003	“Time Duration Analysis of Malayalam Syllables Involving Selected Consonants for Computer Speech Recognition Applications”	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 31, ISSN – 0253-7257, Acoustical Society of India, 2003.
37	2003	“Noise Spectrum Analysis in Transport Vehicles for Active Noise Control Applications”,	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 31, ISSN – 0253-7257, Acoustical Society of India, 2003.
38	2003	“Hidden Markov Model for Malayalam Speech Recognition	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 31, ISSN – 0253-7257, Acoustical Society of India, 2003.
39	2002	“Classification of Malayalam	” <i>J. Acous. Soc. Ind (JASI)</i> , Vol. 30, ISSN – 0253-

		Vowels using average energy distribution in zero-crossing intervals”	7257, Acoustical Society of India, 2002.
40	2002	“Formant Frequency Analysis of Malayalam vowels using Fast Fourier Transformation”	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 30, ISSN – 0253-7257, Acoustical Society of India, 2002.
41	2002	“Transform Coding Gain of DCT and DWHT for Speech Signals”	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 30, ISSN 0253-7257, Acoust. Soci. of India, 2002
42	2001	“Speech Recognition using Zero-crossing Average energy distribution, based on Kolmogrov - Smiranov Test and number of zero-crossing in a limited time window”	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 29, pp. 406 – 412, ISSN – 0253-7257, Acoustical Society of India, 2001
43	1999	“Digital Speech from Zero-Crossings”	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 27, pp. 207-213, ISSN – 0253-7257, 1999.
44	1999	“Voiced/Unvoiced Classification using Second Order attractor dimension and second order Kolmogrov Entropy of Speech Signals	”, <i>J. Acous. Soc. Ind (JASI)</i> , Vol 27, pp. 181-185, ISSN – 0253-7257, Acoustical Society of India, 1999.
45	1998	“A new Voiced / Unvoiced classification Algorithm”	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 26, pp. 440 – 456, ISSN – 0253-7257, Acoustica Society of India, 1998.
46	1988	“A performance improvement study of Adaptive Transform coding of speech at low bit rate”	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 16, pp. 256 – 259, ISSN – 0253-7257, Acoustical Society of India, 1988.
47	1988	“Speech Signal Reconstruction from the Composite Zero crossing and its application in sub-band coding “	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 16, pp. 18-23, ISSN – 0253-7257, Acoustical Society of India, 1988.
48	1987	“Use of zero-crossing information for the extraction of speech parameters”	<i>J. Acous. Soc. Ind (JASI)</i> , Vol. 15, pp. 96 – 101, ISSN – 0253-7257, Acoustical Society of India, 1987.

(b) Publications in Proceedings of Research Conferences

Sl. No	Date	Title	Name of Proceedings of Research Conference
49	2016	“A Support Vector Machine approach for LTP using Amino Acid composition”	Proceedings of <i>International Conference on Signal, Networking, Computing and Systems (ICSNCS-2016)</i> , Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7(eBook) DOI 10.1007/ 978-81-322-3592-7, Vol 396, pp 13-23, Springer, 2016.
50	2016	“Analysis of the Complexity of Brain Under Mobile Phone Radiation Using Largest Lyapunov Exponent”	Proceedings of <i>International Conference on Signal, Networking, Computing and Systems (ICSNCS-2016)</i> , Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7(eBook) DOI 10.1007/ 978-81-322-3592-7, Vol 396,

			pp 147-154, Springer, 2016.
51	2016	“A Novel Fuzzy Filter for Mixed Impulse Gaussian Noise from Color Images”	Proceedings of <i>International Conference on Signal, Networking, Computing and Systems (ICSNCS-2016)</i>, Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7 (eBook) DOI 10.1007/ 978-81-322-3592-7,Vol 395, pp 53-59, Springer, 2016.
52	2016	"Enhanced Automatic Speech Recognition with Non-acoustic Parameters",	Proce., of <i>Intern Conference on Signal, Networking, Computing and Systems (ICSNCS -2016)</i>Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7 (eBook) DOI 10.1007/ 978-81-322-3592-7,Vol 395, pp 93-104, Springer, 2016.
53	2016	"Dynamic Gesture Recognition - A Machine Vision based Approach",	Proceedings of <i>International Conference on Signal, Networking, Computing and Systems (ICSNCS-2016)</i>,Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7 (eBook) DOI 10.1007/ 978-81-322-3592-7,Vol 395, pp 105-115, Springer, 2016.
54	2016	“Analysis of the Effects of Mobile Phone Radiation on Brain using Statistical and Hjorth Parameters”,	Proceedings of International Conference on Signal, Power, Communication, Security and Computing Applications ICSPCSCA pp.117-123 2016, ,
55	2016	“Energy changes in Brain under Mobile Phone Radiation”	Proce. of SAI Computing Conference , July 13-15, 2016 London, UK, pp 990-995, DOI : 978-1-4673-8460-5/16 /2016 IEEE
56	2016	“Increase in Specific Absorption Rate (SAR) of Mobile Phone - A Threat to Human”,	Proceeding of Third International Conference on Next Generation Computing and Communication Technologies (ICNGCCT), Dubai, pp 18-24, 2016
57	2015	”Entropy Analysis to Study the Effects of Mobile Phone Radiation on Brain”	Proceedings ofInternational Conference on Information and Communication Technology Research, ICTRC Abu Dhabi, pp 251-254, ,DOI :978-1-4799-8966-9/15©2015 IEEE, 2015
58	2015	”Analysis of the Effects of Mobile Phone Radiation on Brain using Approximate Entropy”	Proce.of Joint International Conferences on ITC and PEIE 2015. Published by McGraw-Hill Education ,pp 208-215 , 2015
59	2015	”Analysis of Fractal Dimension of EEG Signals under Mobile Phone Radiation”	Proceedings of IEEE International Conference on SignalProcessing, Informatics, Communication and Energy Systems (IEEE SPICES) 2015 ,pp 1-5, DOI : 10.1109/SPICES. 2015.7091494.IEEE, 2015
60	2015	”Distributed Block Based Hysteresis Thresholding Technique for Edge Detection Using Non-Uniform Gradient Magnitude Histogram”	Proceedings of <i>International Conference on Telecommunication Technology & Management (ICTTM 2015)</i>, IIT, New Delhi, April 11,12, ISBN: 9780992680053, 2015
61	2015	"An Efficient Mixed Noise Removal Technique from Gray Scale Images using Noisy Pixel Modification Technique"	<i>IEEE International Conference on Communication and Signal Processing - ICCSP' 15</i>, April 2-4, 2015 ,kancheepuram,DOI: 10.1109/ICCSP.2015.7322901

62	2015	"Image Segmentation Based on Multiple Means Using Class Division Method"	<i>Proceedings International Conference on Industrial Instrumentation & Control</i> , May 28-30, 2015 (ICIC2015), PUNE, pp 1264-1267, DOI: 10.1109/IIC.2015.7150942 , ISBN:978-1-4799-7165-7
63	2015	"Segmentation of Hand Gesture by Histogram Thresholding in HSV Color Space",	Proceedings of the National Conference on Digital Image and Signal Processing – NCDISP 2015, PUNE, 2015
64	2015	"Novel pixel 8 neighborhood frame differencing algorithm for segmentation of moving object in video"	Proc., IEEE International Conference on Electrical, Computer and Communication Technologies - ICECCT 2015
65	2015	"Key-frame extraction by analysis of histograms of video frames using statistical methods"	Proce., Fourth international conference on Eco-Friendly computing and communication systems, ICECCS , 7-8 December 2015,NIT Kurukshetra.
66	2014	"A machine learning approach for detecting MAP kinase in the genome of <i>Oryza sativa</i> L. ssp. <i>indica</i> ."	Proce., of IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology,IEEE Explore, pp1-6, [DOI 0.1109/CIBCB.2014.6845513], 2014.
67	2014	"Interaction of Mobile Phone radiation with Brain ",	Proce.of 14 th Biennial International Symposium on Antenna and Propagation APSYM 2014,CUSAT, Cochin, Vol -1pp 57-60, ISBN 978-93-80098-60-8, 2014
68	2014	"Effects of Mobile Phone Radiation on Brain Using Statistical Parameters and Its Derivatives"	Proceedings of International Conference on Advanced IT, Engineering and Management , SAC AIM 2014.
69	2014	"Effect of Mobile Phone Radiation on Brain – Wavelet Power Approach"	Proceedings of The 18 th World Multi-conference on Systemics, Cybernetics and Informatics WMSCI at Orlando , Volume 1, pp 213-218, 2014
70	2014	"Effect of Mobile Phone Radiation on Brain using Wavelet Energy"	Procee., 15th International Conference on Biomedical Engineering ICBME, Singapore, Volume 43, pp 192-195, DOI : 10.1007/978-3-319-02913-9_49 , Print ISBN :978-3-319-02912-2 Series ISSN 1680-0737, 2014
71	2014	"Effect of Mobile Phone Radiation on Brain Dynamics ",	Proce. of 24 th Swdeshi Science Congress- A National seminar, Tirur, Vol - 2, p 791-796, ISBN: 978-81-928129- 2-2, 2014
72	2013	"A Robust Consonant Classification Algorithm for Noise Corrupted Speech using Wavelet Energy Features"	<i>Proceedings ACOUSTICS 2013</i> , Acoustical Society of India & French Acoustical Society, pp. 1053 – 1058, ISBN – 978 – 93 – 82563 – 48 – 8, Academic Reference Series – Delhi, 2013.
73	2013	"Malayalam Vowel Recognition using Naive Bayes Classifier",.	<i>Proceedings ACOUSTICS 2013</i> , Acoustical Society of India & French Acoustical Society, pp. 1059 – 1064, ISBN – 978 – 93 – 82563 – 48 – 8, Academic Reference Series – Delhi, 2013
74	2013	"A Stochastic Approach for	<i>Proceedings ACOUSTICS 2013</i> , Acoustical Society

		Malayalam Speech Modeling”	of India & French Acoustical Society, pp. 1065 – 1070, ISBN – 978 – 93 – 82563 – 48 – 8, Academic Reference Series – Delhi, 2013.
75	2013	“Morphological Analysis and Parsing for Malayalam Speech Recognition”	Proceedings <i>ACOUSTICS 2013</i> , Acoustical Society of India & French Acoustical Society, pp. 1071 – 1076, ISBN – 978 – 93 – 82563 – 48 – 8, Academic Reference Series – Delhi, 2013
76	2013	“A new feed forward active noise control system for transport vehicles”	Proceedings <i>ACOUSTICS 2013</i> , Acoustical Society of India & French Acoustical Society, pp. 1452 – 1458, ISBN – 978 – 93 – 82563 – 48 – 8, Academic Reference Series – Delhi, 2013
77	2013	“Effect of Mobile Phone Radiation on EEG”	Proceedings of the third International Conference on Advances in Computing and Communications ACC-2013, Kochi, 29-31 August 2013, DOI 10.1109/ICACC.2013.2
78	2013	“Search Time Reduction using Hidden Markov Models for Isolated Digit Recognition”,	Proceedings of Second International Workshop on Signal and Image Processing (SIP 2013), Bangalore, 2013.
79	2013	“Study of Brain Dynamics under Mobile Phone Radiation Using Various Fractal Dimension Methods	Proceedings of ICSIPR2013 International Conference on Signal processing, image processing and pattern recognition, Coimbatore, February7, pp 288-292, 2013, doi 10.1109/ ICSIPR. 2013.6497942
80	2013	“ Effect of mobile phone radiation on brain using EEG analysis by Higuichi's fractal dimension method”	Proceedings of International Conference on Communication and Electronic System Design, (<i>ICCESD-2013</i> ,87601C Jaipur, January 28, 2013, SPIE, doi 10.1117/12.2012177
81	2012	“NACSVMPred: A machine learning Approach for prediction of nac Proteins in rice using support vector machines,”	Proceedings of International Conference on Computer Science & Information Technology (CS & IT-2012) , pp. 83–95, 2012 (DOI: 10.5121/csit.2012.2508)
82	2012	“Prediction of ERF and DREB Proteins Using Support Vector Machine”,	<i>Proceedings of National Conference on Advanced IT, Engineering and Management (SACAIM 2012)</i> , pp 113-117, ISBN-978-93-5087-895-8, 2012.
83	2012	“Modeling and Recognition of Consonant – Vowel units using Statistical Learning Algorithms”,	<i>Proceedings of the National Symposium on Acoustics (NSA)</i> , Acoustical Society of India, pp. 33 – 44, ISBN – 978 – 93 – 82563 – 48 – 8, Academic Reference Series , 2012
84	2012	“Consonant Classification using Time/Frequency Domain Features and Decision Directed Acyclic Graph Support Vector Machine”	<i>Proceedings of the National Symposium on Acoustics (NSA)</i> , Acoustical Society of India, pp. 174 – 180, ISBN – 978 – 93 – 82563 – 48 – 8, Academic Reference Series , 2012.
85	2012	“Time Domain Feature Parameter for CV speech unit Recognition using Statistical	<i>Proceedings of the 2nd National Conference on Indian Language Computing – NCILC-12</i> , pp. 69 – 74, ISBN – 978 – 93 – 80095 – 31 – 8, CUSAT, 2012

		Learning Approach”,	
86	2012	“Time Domain Non-Linear Feature Parameter for V/CV Speech Unit Recognition using Connectionist Approach”,	<i>Proceedings of the IEEE International Conference on Signal, Image and Video Processing (ICSIVP 12)</i> , ISBN-978-3-642-31253-3, Scientific and Academic publishing, 2012.
87	2012	“State Space Point Distribution Parameter for Support Vector Machine based CV unit Classification”	Proceedings of the First International Conference on Information Technology Convergence and Services (ITCS -12) , pp. 291 – 302, ISBN – 978 – 1 – 921987 – 02 – 1, AIRCC - Bangalore, 2012.
88	2011	“Reconstructed State Space based Feature Parameter for CV unit classification using k – Nearest Neighborhood”.	<i>International Conference on Networks, Intelligence and Computing Technologies (ICNICT 11)</i> , pp. 334 – 338, ISBN: 978 – 81 – 8424 – 741 – 1, Allied Publishers Private Limited – Coimbatore, 2011
89	2011	“Active noise control of passenger train cabin with secondary path modeled as a delay block plus random noise,”	<i>Proceedings of International conference on New Paradigms in electronics & Information Technologies (PEIT '011)</i> , ISBN - 978-1-4244-3429-9, IEEE - Alexandria, Egypt, 2011.
90	2011	“A Robust Approach for Malayalam CV Speech Unit Recognition Using Artificial Neural Network”	<i>International Conference on Image Processing, Computer Vision and Pattern Recognition (IPCV'11)</i> , pp. 52 – 56, ISBN – 1-60132-189-9, WORLDCOMP-Las Vegas, USA, 2011.
91	2011	“Identification of putative ERF and TIP gene families in indica rice”	<i>National Conference on Computing and Communication (NCCC 2011)</i> , ISBN - 978-81-908520-1-2, Springer , 2011.
92	2010	“Linear Predictive Model and Wavelet Hybrid Method For Speech Recognition: A Comparative Study”	Proceedings of the National Symposium on Acoustics (NSA) , Acoustical Society of India-Hrishikesh, 2010.
93	2010	“Active Noise Control : a Simulation Study”	Proceedings of International Conference on Computers, Communication & Intelligence (ICCCI) , pp 320 – 325 , ISBN - 978-3-642-16692-1, Springer-Madurai, 2010.
94	2010	“Multimodal Interface for Spastic and Disabled Users”,	Proceedings of Kerala Science Congress, Peechi , pp 479 – 480, ISBN - 81-86366-71-7, Kerala Science Congress – 2010.
95	2010	“Investigations on the Applications of Dynamical Instabilities and Deterministic Chaos for Speech Signal Processing”	Proceedings of Kerala Science Congress, Peechi , pp 483 – 484, ISBN - 81-86366-71-7, Kerala Science Congress, 2010.
96	2010	“Identification of Genes Related to Expansin Gene Family in Indica Rice using Bioinformatics Tools”	Proceedings of Kerala Science Congress, Peechi , pp 485- 486, ISBN - 81-86366-71-7, Kerala Science Congress – 2010.

97	2010	“Recognition of Malayalam Speech: A Comparative Study of Linear Predictive Model and Wavelet Hybrid Method”	<i>Proceedings of Kerala Science Congress, Peechi</i> ,pp 489-490, ISBN - 81-86366-71-7, Kerala Science Congress – 2010
98	2010	“Malayalam Vowel Phoneme Recognition Based on Zero Crossing Based Features Using Artificial Neural Network”	<i>Proceedings of Kerala Science Congress, Peechi</i> ,pp 491-492, ISBN - 81-86366-71-7, Kerala Science Congress – 2010
99	2009	“Phase Space Point Distribution Parameter for Speech Recognition”	IEEE Proce. of International Conferences on Modeling and Simulations- AMS-09 Held at Bali, Malaysia. IEEE-DOI : 10.1109/AMS.2009.81 pp. 345-347, 2009.
100	2008	“Performing Operations on Graph Through Multimodal Interface: An Agent Based Architecture”	Proceedings., IEEE international Conference on Applications of digital Information and Web Technologies, pp 74 – 77, ISBN - 978-1-4244-2623-2, IEEE - Czech Republic, 2008.
101	2008	“Malayalam Vowel Recognition Based On Wavelet Hybrid Features and K-NN Algorithm”.	Proceedings of the Second international conference on Cognition and Recognition (ICCR 08), pp. 17-22, ISBN - 978-81-8424-307-9, Allied Publishers, India, 2008.
102	2008	“Optimum Time Delay for Reconstructed Phase Space Based Speech Recognition”	Proceedings of the Second international conference on Cognition and Recognition (ICCR08), pp. 618 – 623, ISBN - 978-81-8424-307-9, Allied Publishers, India, 2008.
103	2008	“Face recognition using Wavelet Hybrid features and Artificial Neural Network Classifier”.	Proceedings of the Second international conference on Cognition and Recognition (ICCR08), pp. 638-644, ISBN - 978-81-8424-307-9, Allied Publishers – Mandya, India, 2008.
104	2007	“ A Bioinformatics Approach to Find the Functional Genomics of Drought Stress Tolerance in Rice”	Proceedings of Kerala Science Congress, pp. 685 – 686, Kerala Science Congress, 2007.
105	2007	“ Malayalam Speech Phoneme Recognition using Zero Crossing Information of Speech Signal and Artificial Neural Network”	Proceedings of Kerala Science Congress, pp. 871 – 873, Kerala Science Congress, 2007.
106	2007	“Face Recognition Using Wavelet Based Feature Parameter And K-NN Classifier”	Proceedings of Kerala Science Congress, pp. 887 – 888, Kerala Science Congress, 2007.
107	2007	“Feature based approaches for face recognition”.	Proceedings of the National Conference on Recent Advances in Information Security (NCRAIST), pp. 25 – 28, 2007
108	2007	“Lexicon Based Malayalam Word Speech Recognition Using	Proceedings of the National Conference on Recent Advances in Information Security (NCRAIST), pp.

		HMM and VITERBI Algorithm”	61 – 65, 2007.
109	2007	“Malayalam Vowel recognition based on Wavelet decomposition Parameters and K-NN”	Proceedings of Third National Conference on innovations in Information and Communication Technology (NCIICT), pp. 63 – 69, PSG College of Technology, Coimbatore, 2007.
110	2007	“Face recognition using Wavelet Hybrid features and Artificial Neural Network Classifier”.	Proceedings of the IEEE international conference on Innovations in information technology (IIT '07), pp. 476 – 480, ISBN - 978-1-4244-1841-1, IEEE – Dubai, 2007.
111	2007	“Face recognition using Wavelet Hybrid features and k-NN Algorithm”	Proc. of the Interna. conference on Advances in Computer Vision and Information Security (ACVIT07), pp. 738 – 746, ISBN-978-81-89866-74-7, IK International Publishing House ,Aurangabad , 2007.
112	2007	“Malayalam Vowel Recognition based on LPC Parameters and K-NN Algorithm”	Proceedings of the IEEE International conference on Computational Intelligence and Multimedia Applications (ICCIMA), pp. 361 – 365 , ISBN - 0-.7695-3050-8, IEEE publisher - Sivakasi, 2007.
113	2007	“Face recognition using state space parameter and Artificial Neural Network Classifier”,	Proceedings of the IEEE International conference on Computational Intelligence and Multimedia Applications (ICCIMA), pp. 250-256, ISBN - 0-.7695-3050-8, IEEE publisher - Sivakasi, 2007.
114	2006	“Recognition of Vowel and Consonant vowel(CV) units of Malayalam Speech using time duration features and Artificial Neural Networks”	Proc. 6 th National Conference on Recent Trends in Advanced Computing(NCRTAC), pp 121-127, Tirunalveli, 2006
115	2006	“Vowel phoneme recognition using average energy in the zerocrossing interval distribution”	Proc. 6 th National Conference on Recent Trends in Advanced Computing (NCRTAC), pp 46-54, Tirunalveli, 2006
116	2006	“Use of Handwriting feature discription and Artificial Neural Networks to recognize Isolated Character images”	Proc. 6 th National Conference on Recent Trends in Advanced Computing (NCRTAC), pp 16-21, Tirunalveli, 2006.
117	2006	“Hidden Markov Models and Domain Specific Knowledge for Recognition of Isolated Word Images”	Proc. 6 th National Conference on Recent Trends in Advanced Computing (NCRTAC), pp 9-15, Tirunalveli, 2006.
118	2006	“Hidden Markov Model for Isolated word speech recognition based on large vocabulary”	Proceedings of the National Symposium on Acoustics (NSA), Acoustical Society of India - NPL New Delhi, 2006.
119	2006	“Nonlinear phase space features for pitch detection”	Proceedings of the National Symposium on Acoustics (NSA), Acoustical Society of India - NPL

			New Delhi, 2006
120	2006	“Handwritten Character Recognition Using State-Space Parameters and K-NN Classifier”	Proceedings of the IEEE Int. Conference on Image and Signal Processing (ICSIP), ISBN-10:0230-63003-0, pp. 196 – 201, MacMillan Advanced Research Series - Hubli, 2006.
121	2006	“Isolated word speech recognition using lexicon based Hidden Markov Model”	Proceedings of the IEEE Int. Conference on Image and Signal Processing (ICSIP), ISBN-10:0230-63003-0, pp. 988 – 991, MacMillan Advanced Research Series - Hubli, 2006.
122	2006	“Recent Trends in Face Recognition”	Proceedings of National Workshop on Pattern Recognition and Image Processing, AcharyaNagarjuna University, Guntur, 2006.
123	2005	“Vector Quantization of speech Spectrum”	Proceedings of the National Conference on Computer Science & Informatics, St-Josephs College-Tiruchi, 2005.
124	2005	“Computational Linguistic Approach for Continuous Speech Recognition”	Proceedings of the National Conference on Computer Science & Informatics, St-Josephs College-Tiruchi, 2005.
125	2005	“Zero crossing based speech pattern recognition using Kolmogrov-Smirnov Statistical Test and Artificial Neural Networks”.	Proceedings of the International Conference on Frontiers of Research on Speech & Music (FRSM-2005), pp. 90 – 98, Utkal University, Bhuvaneshwar, Jan.6-8, 2005
126	2005	“Study of Pitch Variation in Vowel Sounds of Malayalam Speech and its Applications for Reconstruction of Vowels”	Proceedings of the International Conference on Frontiers of Research on Speech & Music (FRSM-2005), pp. 144 – 147, Utkal University, Bhuvaneshwar, Jan.6-8, 2005
127	2005	“Recognition of Handwritten word images using Lexicon based Word modeling and A* Algorithm”	Proc. Int. Conference on Cognition and Recognition (ICCR), ISBN- 81-7764-952-3, pp. 581-588, Allied Publishers , Mandya,2005
128	2005	“Recognition of Isolated Hand written Character Images using Kolmogrov –Smiranov Statistical Classifier and K Nearest Neighbor Classifier”	Proc. Int. Conference on Cognition and Recognition(ICCR 05), ISBN- 81-7764-952-3, pp. 526-531, Allied Publishers Pvt. Ltd. - Mandya, 2005.
129	2004	“Hidden Markov Models and Domain Specific (Heuristic) Knowledge for Recognition of Isolated Word Images”	Proc. of 1 st International Conference on Computer Engineering (ICENCO-04), Cairo, Egypt., 2004
130	2004	“A Quick Review on Face Recognition”	Proceedings of the National Conference on Geometry, Analysis, Fluid Mechanics and Computer Applications, Kuvempu University-Karnataka, 2004.
131	2004	“Computer Recognition of Off-	Proceedings of the National Conference on

		line Handwritten Document Images - A Soft Computing Perspective”	Geometry, Analysis, Fluid Mechanics and Computer Applications, Kuvempu University Karnataka, Dec. 9-11, 2004.
132	2004	“Artificial Neural Network Classifier for Recognizing Malayalam Consonant- Vowel Units”	Proceedings of the National Seminar on Artificial Intelligent and Neural Networks, Alwaye, Mar.25-27 ,2004.
133	2004	“Malayalam Vowel Phoneme Recognition Using Zero crossing Based Distribution Patterns”	Proceedings of National Symposium On Physics(PHYSICA '04), Vol.1, pp.30-41, Jan.27-28, 2004
134	2003	“Vowel Phone Recognition Using Zero crossing Based Distribution Pattern and Artificial Neural Networks”	Proceedings of the National Conference on Signal Processing, Intelligent Systems and Networking(SPIN), pp.49-54, Bangalore, 2003.
135	2000	“Application of Phase Space Map and Phase Space point distribution in Speech Recognition”	Proce., IEEE, Int. Conf. On Communication, control and Signal Processing (CCSP), pp 98-101, IISc, Bangalore, 2000.
136	2000	“Optimal Bit allocation and step-size quantization for Adaptive transform coding of Speech”	Proc. Fifth internat.workshop on recent trends in music and allied Signal Processing, pp 26-38, Trivandrum , 2000.
137	1999	“Malayalam phoneme duration analysis for computer speech recognition application”	Proc. National Seminar on Information Revolution and Indian Languages, pp 18-1 to 18-4, Hydrabad, 1999.
138	1999	“Speech Recognition Using zero crossing interval distribution , based on KolmogorveSmiranov Test”	Proc. National Seminar on Information Revolution and Indian Languages, pp 21-1 to 21-6, Hydrabad, 1999.
139	1999	“Development of Anti-Aliasing Pre-sampling Filter for Multimedia card based data acquisition System”	Proc. National Seminar on Information Revolution and Indian Languages, pp 16-1 to 16-6, Hydrabad, 1999.
140	1999	”Detection of Noisy Sinusoids from Zerocrossing for sonars.”	Proc. SYMPOL '99, pp 35-43, Cochin, 1999.
141	1999	”A Robust speech modeling method using Zero-crossing interval and energy”	Proc. National Conference on Electronic materials, devices and Systems, pp 454 – 459, Gulbarga, 1999.
142	1994	“Speech Digitization by Sampling its Zero-crossing”	Proceedings of 10 th National convention of Electronics and Telecommunication Engineers and National Seminar on Modern Telecommunication Networks, pp 105-109, Coimbatore, 1994
143	1991	“Enhanced Adaptive transform coding of speech by Adaptive	Proceedings of Indian Computing Congress, pp 43-53, Hyderabad, 1991.

		switching of Transformations”	
144	1989	“DCT/DWHT Adaptive Transformation coding of speech”	Proc. NACONECS-1989, Roorkee, Nov 2-4, 1989.
145	1988	“Parametric representation of the Dynamical instabilities and Deterministic chaos in signals”	Proc. Symposium on Signals, System and Sonars, NPOL, Cochin, March 9-11, 1988.
146	1988	“Speech Sample Estimation from its composite Zero-crossing’s”	Proc. Symposium on Signals, Systems and Sonars, NPOL, Cochin, March 9-11, 1988
147	1987	“Reconstruction of speech by sampling its Zero-crossings”	Proc. National Symposium on Computer Aided Engg, SVUCE, Thirupathi, Feb 27-28, 1987

(c) Papers communicated to Journals

No	Date	Title	Name of Journal
148	2017	LTP Prediction based on Amino acid Compositions using Machine Learning Algorithms	Communicated to IEEE/ACM transactions on Computational Biology and Bioinformatics
149	2017	Enhanced Multimodal Implementation with Context dependent Input modality suggestion and Dynamic Input ambiguity Resolution	communicated to IEEE Transactions on Human Machine Systems
150	2017	Non-acoustic Parameters for Improving the Accuracy of Automatic Speech Recognition System Under Noisy Environment	Communicated to Journal of Multimodal Interface, Springer Verlag
151	2017	An Enhanced Two-pass Classifier for Face Recognition Using Back-propagation Neural Networks and Support Vector Machines	International Journal of Pattern Recognition and Artificial Intelligence

(c) Papers communicated to forthcoming conferences

No	Date	Title	Name of Conference
152	2017	Block DCT Coefficients and Histogram for Image Retrieval	accepted for presentation in the International Conference on Signal processing and Communication (ICSPC '17) which will be held during July 28th and 29th, 2017 at Coimbatore

14. Number of Books published / under publication : 13 book chapters published
(10 by Springer Int & 3 by National Publishers)

Details of Contribution to Books:

No	Year	Details of book chapters published
1	2016	"Multi-modal Interface for Effective Man Machine Interaction", Handbook on Media Convergence Vol 2, ISBN 978-3-642-54486-6 , DOI 10.1007/978-3-642-54487-3, Springer, 2016.
2	2016	"A Support Vector Machine approach for LTP using Amino Acid composition", Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7 (eBook) DOI 10.1007/978-81-322-3592-7, Vol 396, pp 13-23, Springer, 2016.

3	2016	"Analysis of the Complexity of Brain Under Mobile Phone Radiation Using Largest Lyapunov Exponent", Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7 (eBook) DOI 10.1007/978-81-322-3592-7, Vol 396, pp 147-154, Springer, 2016.
4	2016	"A Novel Fuzzy Filter for Mixed Impulse Gaussian Noise from Color Images" Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7 (eBook) DOI 10.1007/978-81-322-3592-7, Vol 395, pp 53-59, Springer, 2016.
5	2016	"Enhanced Automatic Speech Recognition with Non-acoustic Parameters", Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7 (eBook) DOI 10.1007/978-81-322-3592-7, Vol 395, pp 93-104, Springer, 2016.
6	2016	"Dynamic Gesture Recognition - A Machine Vision based Approach", Lecture Notes in Electrical Engineering, ISBN 978-81-322-3590-3, ISBN 978-81-322-3592-7 (eBook) DOI 10.1007/978-81-322-3592-7, Vol 395, pp 105-115, Springer, 2016.
7	2013	"NACPred: computational prediction of nac proteins in rice implemented using SMO algorithm", Advances in computing, communication and control, (Lecture Notes in Computer Science), Vol. 361, pp 266-275, ISSN 1865-0929, Springer, 2013.
8	2012	"Wavelet Transform based Consonant – Vowel (CV) Classification using Support Vector Machines", Neural Information Processing – (Lecture Notes in Computer Science), ISBN- 3-642-34480-1, Vol. 7664, Springer, 2012.
9	2012	"Normalized Wavelet Hybrid Feature for Consonant Classification in Noisy Environments", Advances in Intelligent Systems and Computing, ISBN - 978-81-322-0739-9, Vol. 174, Springer, 2012
10	2011	"Active Noise Control", <i>Acoustics Waves</i> , ISBN – 978-81-832-9441-6 , Shree Publishers & Distributors – New Delhi, 2011
11	2011	"Wavelet Hybrid Feature for Malayalam CV Speech Unit Recognition using Artificial Neural Networks", <i>Acoustics Waves</i> , ISBN – 978-81-832-9441-6 , Shree Publishers & Distributors – New Delhi, 2011.
12	2008	"Face Recognition using Wavelet Hybrid Features and k-Nearest Neighbor Classifier", <i>Advances in Computer Vision and Information Technology</i> , ISBN- 978-81-89866-74-7, I.K. International Publishing House Pvt. Ltd. – New Delhi, 2008.
13	2004	" Phase Space parameters for Neural Networks Based Vowel Recognition", <i>Neural Information Processing – (Lecture Notes in Computer Science)</i> , ISBN- 3-540-23931-6 Vol. 3316, pp.1204-1209, Springer, 2004.

15. Number of Projects (Completed / in progress) : completed –5

Details of Projects Undertaken:

Sl. No	Client/Organisation	Nature of Project	Duration of Project	Amount of Grant (Rupees)
1	KSCSTE	Major Research Project (PI)	3 years (1996-1999)	75,000
2	UGC	Major Research Project (PI)	3 years(1997-2000)	3,20,000
3	KSCSTE	Major Research Project (PI)	3 years(2005-2008)	5,88,500
4	KSCSTE	Major Research Project (Co PI)	3 years(2008-2011)	9,60,000
5	UGC	Establishing UGC Computer Centre at Kannur University	10 th Plan	36,00,000