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SSN

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HIGHLIGHTS

UNDERWATER ACOUSTICS MODEM
AN OVERVIEW OF TECHNOLOGY AND CHALLENGES

MS.G.ANNALAKSHMI, RESEARCH SCHOLAR,
DR.S.SAKTHIVEL MURUGAN, ASSOCIATE PROFESSOR

INTRODUCTION :

Today underwater communication is finding various communications. The unique characteristics of underwater acoustic channel pose great challenges to communications. Since electromagnetic waves do not propagate well in underwater environments, underwater communications have to rely on other physical means, such as sound, to transmit signals. The underwater communication is further more challenging due to factors like reverberation, attenuation, scattering and absorption etc., due to sea characteristics apart from various sources of ambient noises due to natural and manmade. Hence, an underwater acoustic modem plays a vital role for signal transmission in underwater for long distance. Thus, it is important to study the various types of underwater acoustic modems. This article provides a comprehensive overview of the technologies, challenges and recent development in various types of underwater acoustic modems available at present. This survey also provides the operational classifications of modems under various frequencies. This article addresses the gaps in development of modems for underwater long distance communication which can pay interest for development of Indigenous modems for commercial and research applications in future.

Two-thirds of the surface of the Earth is covered by water. Humans are curious about unexplored world of underwater. Recently, there has been a growing interest in monitoring underwater for scientifc exploration, commercial exploitation, and to protect from attack. There has been a great growing interest in transmitting real-time data, video and sonar images. An unmanned underwater vehicle (UUVs) for military and scientifc applications has become important. The main reason is for the minimum technological advancement in the field of oceanography compared to land and space. The general comparison on frequency range, transmission distance, speed, types of signal, data rate etc., for terrestrial and underwater medium is shown in Table 1. From the table it is observed that the velocity of signal in underwater is very low. The velocity of sound in sea water depends on the temperature, salinity and hydrostatic pressure of the water column. The speed of sound in underwater is high compared to terres-

trial. Since the acoustic channel is highly variable the underwater acoustic modem is preferred for effective and reliable transmission of acoustic signals in underwater channel.

Table.1 Parameters of various Communication medium

S. No	Parameters	Communication Medium		
		Ocean	Ground	Space
1	Frequency	<100KHz	<300MHz	<30GHz
2	Distance	Short	Long	Very Long
3	Speed	1500 m/s	3×10^8 m/s	3×10^8 m/s
4	Types of Signal	Acoustics	Radio wave	Radio wave
5	Data Rate	<100Kbps	<10Mbps	<100Gbps

The block diagram and classifications of modem based on frequency of operation is shown in Fig.1
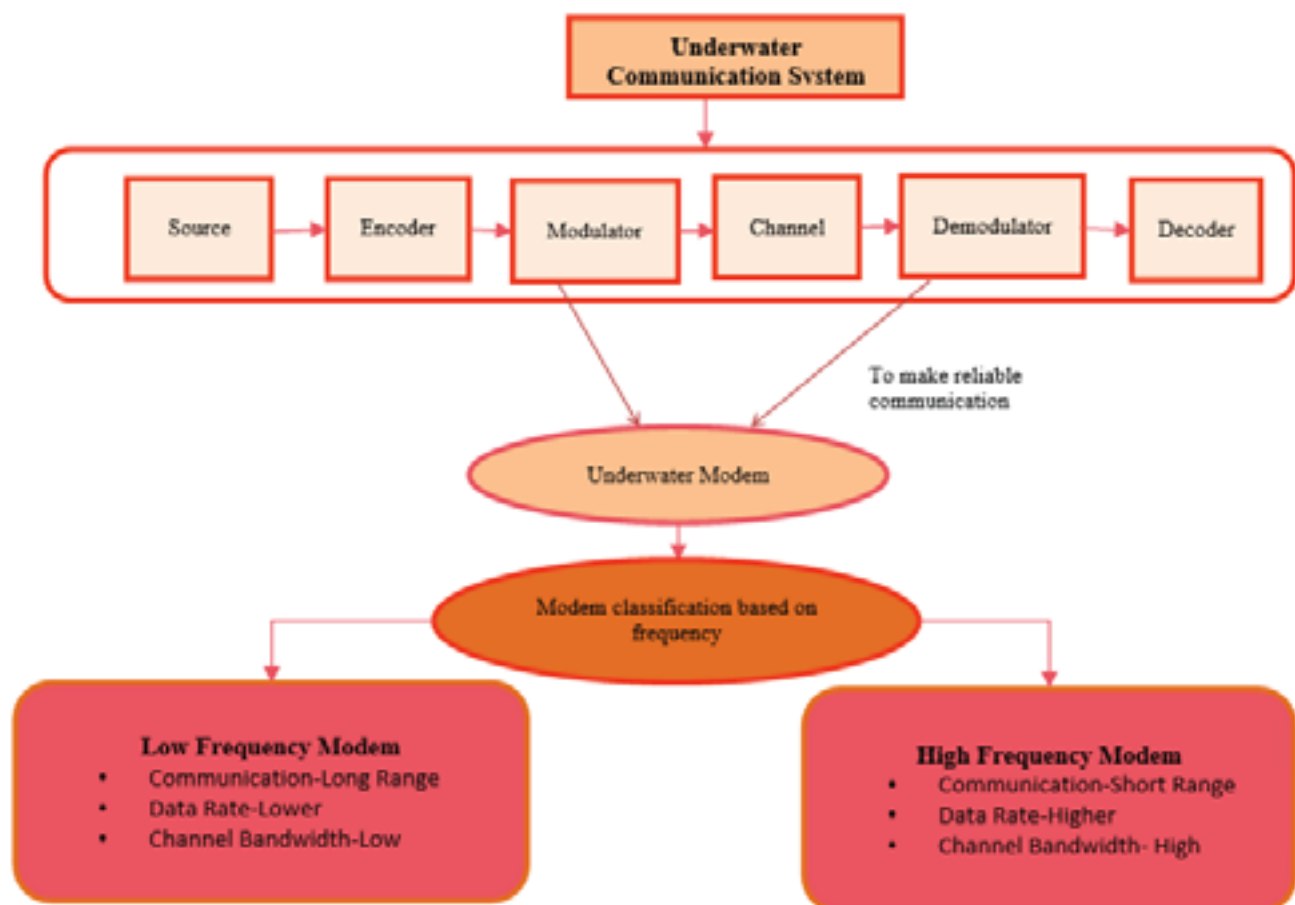
Fig.1 General Block diagram and characteristics of low-High frequency modem

COMMERCIAL UNDERWATER ACOUSTIC MODEMS

Table 2 below shows the comparison of various types of commercial underwater acoustic modems that are available for various underwater applications. The classification is based on parameters like bandwidth, data rate, and power consumption and transmission range.

Table.2 Comparison of Commercial underwater acoustics modem

Make	Model	Modem Image	Bandwidth (KHz)	Data Rate (bps)	Power			Transmitting Range (meters)
					Idle power (mW)	Transmit power (Watts)	Receive Power (watts)	
Linquest	1000		26. 77 - 44.62	9600	8	1	0.75	350
Linquest	2000		26. 77 -44.62	9600	8	2 - 8	0.8	1500
Linquest	2200		26. 77 - 44.62	1500	8	2 - 8	0.8	1200
Linquest	10000		7.5 -2.5	2500	9	40	0.9	10000
Evologic	S2CR 18/34		18 -34	1390	2.5	2.8	<1.3	3500
Evologic	S2CR 42/65		42 -6	31200	2.5	5.5	<1.1	1000
Evologic	S2CM-HS		120 - 200	-	0.5	3.5	0.8	300
Aquascent	AUV		21 - 27	1500	<12	<25	<8	5000
Aquascent	AM-D2000		9-15	1500	<12	<25	<8	5000
Aquascent	OFDM-13A		21 -27	1500	<12	<25	<8	5000
Teledyne Benthos	99x		11.5 -18.5	15360	16.8	20	0.76	6000
Teledyne Benthos	88x		11.5 -18.5	15360	16.8	84	0.756	6000
Tri Tech- Micron	Micron		20 - 28	40	-	7.92	0.72	500

3

ADVANTAGES AND APPLICATIONS OF VARIOUS UNDERWATER ACOUSTIC MODEMS

The commercial underwater acoustic modem technical merits and applications are presented in Fig 2. In future the high frequency modem development should focus on the following qualities like long range, low power, small size, and higher data rate to make an effective underwater communication.
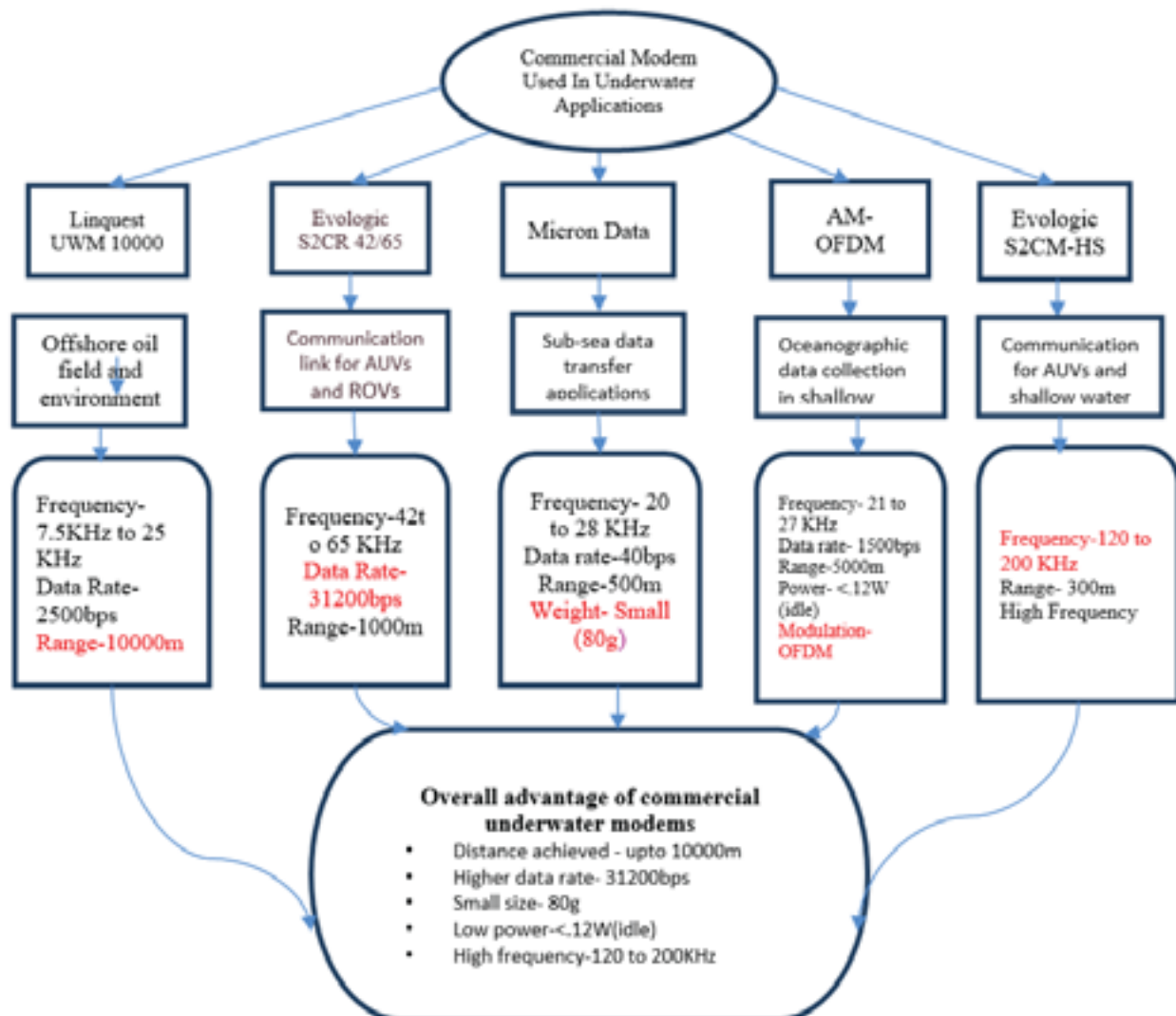
Fig.2 Technical merits and application of commercial underwater acoustic modems

FUTURE DIRECTION FOR UNDERWATER MODEM

Existing mechanisms for conventional modems need to be modified, or even inter–changed to suit the newly emerged technology. The view and progress expected for development in high frequency underwater modems are shown in Fig.3
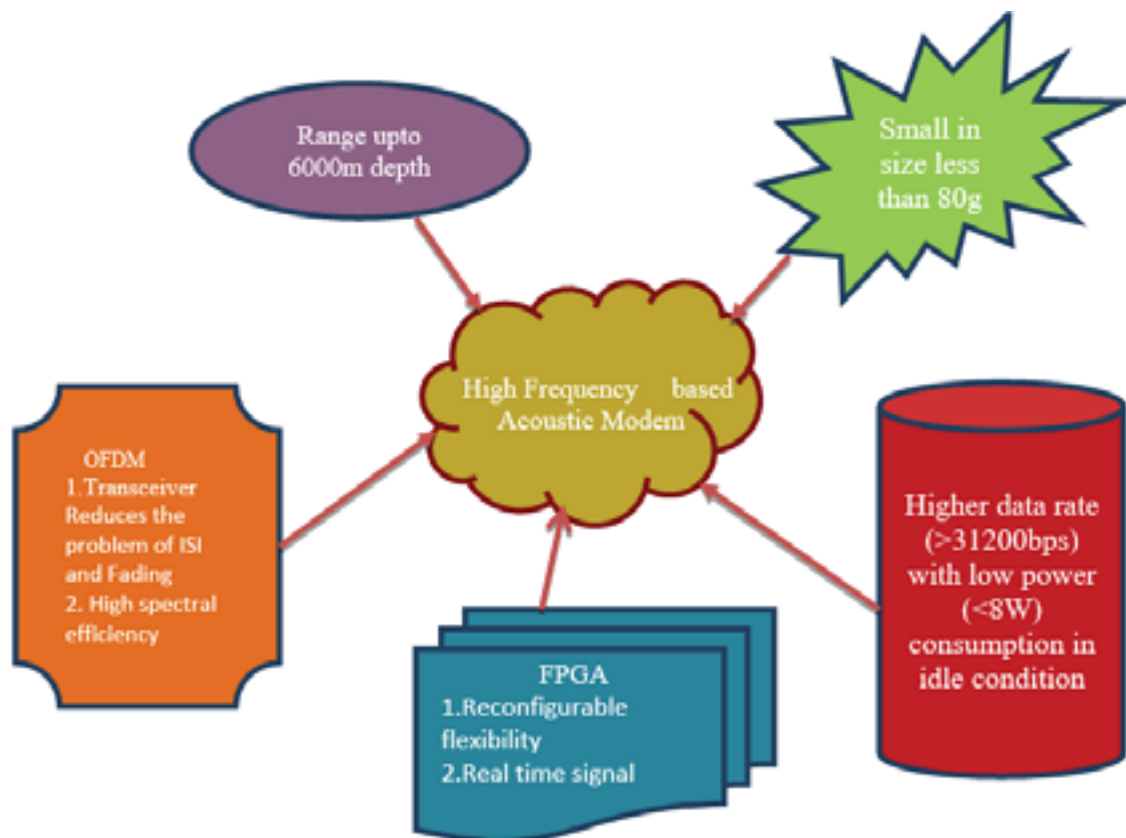
Fig.3 Future Direction for Underwater Modem

Based on the intensive search made on the availability of indigenous underwater acoustic modem, it is noticed that only very few institutes like National Institute of Ocean Technology and Naval Physical Oceanographic Laboratories are developing an Indigenous underwater acoustic modem and they are yet to be tested and implemented though we have many commercially available modems in market globally. Hence more research addressing the above factors mentioned in figure 3 will further enhance the use of underwater modem in various underwater applications.

REFERENCES
1.   B. Li, S. Zhou, M. Stojanovic, L. Freitag, and P. Willett, 'Multicarrier commu nication over underwater acoustic channels with non -uniform Doppler shifts,' IEEE Journal of Oceanic Engineering, vol. 33, no. 2, pp. 198   209, Apr. 2008.
2.   Sandipa Singh, Sarah E. Webster, Lee Freitag, Louis L. Whitcomb, Keenan Ball, John Bailey and Chris Taylor ' Acoustic Communication Performance of the WHOI Micro-Modem in Sea Trials of the Nereus Vehicle to 11,000 m Depth'. Woods Hole Oceanographic Institution, Woods Hole, Oceans, 2009.
3.   Brady Paradis, Corey L. Bachand, Paul J. Gendron and David A. Brown (2014). 'Development of a high frequency underwater acoustic communication mo dem'. Proceedings of Meetings on Acoustics, Acoustic Society of America, vol. 21. 2014
4.   Nusrat Nowsheen, Craig Benson and Michael Frater (2010). 'A High Data-Rate, Software-Defined Underwater Acoustic Modem'. Proceeding of IEEE Interna

tional Conference on Ocean10, pages 1–5, 2010.

5. Hai Yan, Shengli Zhou, Zhijie Shi, Jun-Hong Cui, Lei Wan, Jie Huang, and Hao Zhou (2010).DSP 'Implementation of SISO and MIMO OFDM Acoustic Mo dems'. Proceedings of IEEE International Conference on Ocean10, pp1–6, 2010.

6. Arnaud Bourrie, Said Lmai, Christophe Laot and Sebastien Houcke, 'A Robust OFDM Modem for Underwater Acoustic Communications Modems'. Pro ceedings of IEEE International Conference on Ocean13, pp1–3. 2013.

VISITS AND INTERACTIONS

1. Dr. S. Sakthivel Murugan, Asso. Prof., Dr. P. Venugopal, Asso. Prof., Ms. Annalakshmi and Ms. Swathi (Full time Research Scholars) had discussion with Mr. K. Balan, Senior Director and Mr. V. K. Haridas, Director-Technical from Cedicom Electronics, Kerala on funding proposals. Subsequent to the discussions, Mr. K. Balan, Senior Director and Mr. V. K. Haridas, Director-Technical visited the underwater acoustic research lab established at the department and had a discussion on enhancement of the lab on 8th Jun. 2016.

2. Dr. S. Sakthivel Murugan, Asso. Prof., Dr. S. Radha, Prof. & Head, Dr. B. S. Sreeja, Asso. Prof. had discussion with Dr. Manohar, Director (Research), AMET University regarding project funding on 28th Jun. 2016.

3. On 6th Jul. 2016, Dr. S. Sakthivel Murugan, Asso. Prof. and his team interacted with Mr. Nagoor Kani, Director, RBA Groups, on the facilities available, completed and ongoing projects in the underwater acoustic research lab during his visit.

4. On 8th Jul. 2016, Dr. S. Radha, Prof. & Head visited C-DAC Bangalore and had discussions with Mr. Dwarakanath, Scientist - C, regarding the new release of Wireless Sensor nodes.

5. Dr. S. Sakthivel Murugan, Asso. Prof visited National Institute of Ocean Technology on 14th Jul. 2016 and interacted with Ms. Malarkodi, Scientist regarding establishment of acoustic test tank in SSN. He also interacted with Mr. Raghu and Mr. Thirunavukarasu regarding the possibilities for funded projects.

6. On 21st Jul. 2016, Dr. S. Radha, Prof. & Head visited IGCAR and had discussions with the Group Director and Head, Computer Division regarding students' internship at IGCAR.

7. On 29th Jun. 2016, Dr. S. Radha, Prof. & Head, and Dr. R. Hemalatha, Asso. Prof., presented a collaborative project proposal along with CSIR CEERI, Chennai to the CSIR CEERI, team. The following members attended the same.
Dr. S.A.V. Sharma, Director, CSIR-CEERI, Chennai
Dr. A. Gopal, Deputy Director, CSIR-CEERI, Chennai
Dr. Shashikant Sadistap, Sr. Principal Scientist, Head, Agri Electronics Group, Professor, Academy of Scientific & Innovative Research (ACSIR), (CSIR-CEERI), Pilani, Rajasthan.

8. Dr. K. Muthumeenakshi, Asso. Prof. and Dr. R. Hemalatha, Asso. Prof. visited CSIR-CEERI, Chennai on 19th Aug. 2016 and had discussions with Dr. A. Gopal,

Chief Scientist & Scientist-in-charge, on conducting a collaborative workshop on "Internet of Things for Industrial Applications". They also visited Aricent Technologies, Chennai and had discussions with Mr. S. Vijay Anand, Director-Technology, on the project "Image Transmission in M2M/IOT scenario".

9.   Mr. S. Ramprabhu, Asst. Prof. and Dr. M. Gulam Nabi Alsath, Asso. Prof. along with the students of PG AE and CS visited News 7 Tamil Channel on 20th Aug. 2016.

10.   On 22nd Aug. 2016, Dr. S. Sakthivel Murugan, Asso. Prof. and his team member had discussion with Mr. Haridoss, Director (Technical), Ceedicom Electronics, Kerala in underwater acoustic research lab, SSN on enhancement of lab and possible MoU.

11.   Dr. S. Radha, Prof. & Head presented department projects and research activities to Tata Elxsi team in IITM Research park, Chennai on 22nd Aug. 2016.

12.   On 22nd Aug. 2016, Dr. S. Radha, Prof. & Head, Dr. K. T. Selvan, Prof. and Dr. S. Joseph Gladwin, Asso. Prof. visited Tata Elxsi, Chennai and discussed regarding possible ways to enhance collaboration through MoU.

13.   Dr. Kalimuthu, Asso. Prof., SRM University, Katankulathur with his team interacted with Dr. S. Sakthivel Murugan, Asso. Prof. and his team on research challenges and applications in underwater. The team also visited the underwater acoustic research lab on 24th Sep. 2016.

14.   First year PG students and Research Scholars visited CSIR, Taramani, Chennai on 28th Sep. 2016 during the Open Day. Dr. R. Kalidoss, Asso. Prof and Dr. R. Hemalatha, Asso. Prof. accompanied the students.

15.   On 28th Sep. 2016, Dr. S. Sakthivel Murugan, Asso. Prof. and his research scholars Ms. G. Annalakshmi and Ms. S. Swathi interacted with Dr. P. Shanmugam, Professor, Ocean Engineering Department, IIT Madras on joint work to be carried in the field of ocean engineering and underwater communication. They also visited the Ocean optics and Imaging lab at IIT-M. They also interacted with Dr. G. A. Ramadass, Project Director, NIOT on various driving areas of research in Underwater communication that can be useful for naval or oceanic society.

16.   Mr. R. Thirumavalavan, Deputy Manager, R & D, Manatech Pvt Ltd visited the underwater acoustic research lab on 5th Oct. 2016 and interacted with Dr. S. Sakthivel Murugan, Asso. Prof. and his research group. Dr. S. Sakthivel Murugan, Asso. Prof. initiated the industry-institute interaction with Mr. R. Thirumavalavan, Deputy Manager, R & D, Manatech Pvt Ltd. The discussion was on sharing of technology & students in terms of job, internship etc.

17.   Dr. S. Sakthivel Murugan, Asso. Prof. and Ms. S. Swathi, Fulltime research scholar interacted with Mr. D. Rajasekar, Project Director and Head, Vessel man-agement System, NIOT.

18.   Dr. S. Radha, Prof. & Head and Dr. R. Hemalatha, Asso. Prof. interacted with Dr. Santanu Chaudhury, Director, CSIR-CEERI, along with Dr. A. Gopal, Chief Scientist & Scientist-in-charge, CSIR-CEERI Chennai regarding workshop, skill development program and signing MOU between SSN and CSIR- CEERI.

19.   Dr. S. Sakthivel Murugan, Asso. Prof. had interaction with Dr. Haridass, Director Technical, Ceedicom Electronics for MoU between Underwater Acoustic Research Lab (UARL) at SSN and Ceedicom.

20.   On 28th Nov. 2016, Dr. K. T. Selvan, Prof/ECE attended a meeting along with 6 other colleagues from SSN at Tata Elxsi to discuss project ideas for collaboration. This meeting was a part of implementing one clause of the MoU between the two institutions.

21.   Dr. S. Radha, Prof. & Head, Dr. N. Edna Ellizabeth, Prof. and Dr. R. Kishore, Asso. Prof. visited SETS India and at-tended meeting with Executive Director regarding student internship, faculty in-ternship, Collaborative project and sign-ing MOU between SSN and SETS.

EXPERT LECTURES

TALKS AT THE DEPARTMENT

1.   Dr. T. Shanmuganantham, Asst. Prof., Department of Electronics Engineering, Pondicherry University, "Millimeter-wave for 5G Applications" organized by Department of ECE, SSNCE along with IEEE Microwave Theory and Techniques Society (MTT-S) Madras Chapter on 15th Sep. 2016. Mr. Karthie, Asst. Prof. coordinated the same.

2.   Dr. C. Chandra Sekhar, Professor, Department of Computer Science and Engineering, IIT Madras, "SVMs for Pattern Classification" for the PG (AE & CS) students on 24th Sep. 2016.

3.   Prof. R. Jayakumar, Retired Scientist, CVRDE, "Engineering EMI/EMC Concepts" for the PG (CS) and final year ECE students on 24th Sep. 2016.

Prof. R.Jayakumar on 'Engineering EMI/EMC concepts'

FACULTY TALKS ELSEWHERE

1. Dr. K. T. Selvan, Prof., "Uncertainty in antennas measurements" at the IEEE India Antenna Week held in Madurai on 9th Jun. 2016.

2. Dr. K. T. Selvan, Prof., "Understanding periodic structures in electromagnetics" in the Workshop on Advanced topics in Signal processing, RF and Wireless Communication held at IITDM, Kanchipuram on 14th Jun. 2016.

3. Dr. B. S. Sreeja, Asso. Prof., "Power amplifiers" & "Oscillators" in the STTP on VLSI for Wireless Communication System Design organized by Department of Electronics and Communication Engineering, SSN College of Engineering, on 15th Jun. 2016.

4. Dr. V. Vaithianathan Asso. Prof., "Low Noise Amplifiers" in the STTP on VLSI for Wireless Communication System Design organized by Department of Electronics and Communication Engineering, SSN College of Engineering, on 15th Jun. 2016.

5. Dr. K. T. Selvan, Prof., "Understanding electrical properties of dielectrics" at the IEEE AP-S seminar held in Kaunya University, Coimbatore on 8th Jul. 2016.

6.   Dr. K. T. Selvan, Prof., "Acquiring independent learning skills through dissertation work" to students and faculty of SSN organized by IEEE Communication Society Student Chapter, SSNCE on 18th Jul. 2016.

7.   Dr. S. Radha, Prof. & Head delivered keynote address in 2nd International conference on Applied theoretical computing and communication technology 2016 technically sponsored by IEEE Bangalore section held at Bangalore on 22nd Jul. 2016.

8.   Dr. K. T. Selvan, Prof., "Understanding and addressing EM education challenges: Personal perspectives" at National Taiwan University, Taiwan on 25th Jul. 2016. This talk was organized by IEEE Taipei Section and funded by IEEE AP-S.

9.   Dr. M. Gulam Nabi Alsath, Asso. Prof., "Trends and Developments in Microwave Engineering" at Panimalar Engineering College, Chennai on 4th Aug. 2016.

10.   Dr. P. Vijayalakshmi, Prof., "Signal processing of speech – features to modeling" at IET sponsored workshop on Speech Signal Processing held at SRM university, Chennai on 16th Aug. 2016

11.   Dr. R. Amutha, Prof., "Recent trends in information theory" at SSN in the IEEE sponsored workshop for the school children on 22nd Aug 2016.

12.   Dr. S. Joseph Gladwin, Asso. Prof., "Digital Signal Processing" at Jerusalem College of Engineering, Chennai on 29th Aug. 2016.

13.   Dr. R.Hemalatha, Asso.Prof., "Recent Trends in Image Processing" at VIT University, Chennai on 8th Sep. 2016.

14.   Dr. R. Jayaparvathy, Prof. "Wireless Relay Networks for WBAN" in the Faculty Development Program at PSG College of Technology, Coimbatore on 9th September 2016.

15.   Mr. C. Vinothkumar, Asst. Prof. attended Research Scholar's Day and presented a paper titled "Hybrid Prediction error–based Difference Expansion Reversible Watermarking" at Department of Instrumentation Engineering, MIT, Anna University.

16.   Dr. R. Rajavel, Asso. Prof., "Digital Signal Processing" at Thangavelu Engineering College, OMR, Chennai.

17.   Dr. S. Radha, Prof. & Head "Routing Algorithms for Computer Networks" AU sponsored FDP on Computer Networks at MIT, Chennai.

18.   Dr. K. T. Selvan, Prof., "Understanding periodic structures in electromagnetics" at Annamalai University.

EVENTS ORGANIZED
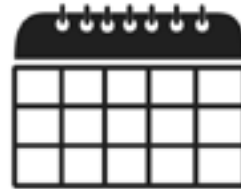
1.   National Level Short Term Training Programme (STTP) on VLSI for Wireless Communication System Design
Date: 13th to 19th Jun. 2016
Conveners: Dr. Premanand V. Chandramani, Prof, Dr. V. Vaithianathan, Asso. Prof and Dr. K. J. Jegadishkumar, Asso. Prof.
Sponsors: Department of ECE
Resource Person: Dr. PV Ramakrishna, Prof., CEG, Anna University, Chennai; Dr. M. Ganesh Madan, Prof., MIT, Chennai; Dr. R. Srinivasan, Prof., SSNCE;
Dr. Premanand V. Chandramani, Prof., SSNCE; Dr. N. Venkateswaran, Prof., SSNCE; Dr. V. Vaithianathan, Asso. Prof., SSNCE; Dr. B. S. Sreeja, Asso. Prof., SSNCE; Dr. K. J. Jegadishkumar, Asso. Prof., SSNCE; Dr. K. K. Nagarajan, Asso. Prof., SSNCE; Mr. T. Ravishankar, Director, RFWaveZera
Participants: 24 participants from various Engineering colleges

2.   National Conference on Research Challenges in VLSI Design & Embedded System for Wireless Communication System
Date: 20th & 21st Jun. 2016
Conference Chair : Dr. S. Radha, Prof.& Head.
Organizing Chair: Dr. Premanand V. Chandramani, Prof, Dr. V. Vaithianathan, Asso. Prof, Dr. R. Rajavel, Asso. Prof, Dr. K. K. Nagarajan, Asso. Prof
Sponsor: Department of ECE
Speakers: Dr.Brajesh Kumar Kaushik, Asso. Prof., IIT-Roorkee; Mr. Ravi Thilak, Director, RF WaveXra; Dr. M. Meenakshi, Prof., CEG, Anna University, Chennai; Dr. T. Nandha Kumar, University of Nottingham, Malaysia.
Participants: 44 papers were presented during the conference

3.   Shannon Centennial Seminar on Information Coding Techniques
Date: 22nd Jul. 2016
Coordinators: Dr. S. Radha, Prof & Head; Dr. B. S. Sreeja, Asso. Prof.;
Dr. K. Muthumeenakshi, Asso. Prof.
Sponsors: IEEE Information Society
Speakers: Dr. R. Kishore, Asso. Prof., Dr. K. Muthumeenakshi, Asso. Prof., Dr.R.Amutha Prof , Dr.Joe Louis Paul I Asso. Prof., (IT)
Participants: 106 Participants from various schools

4.   Workshop on Wireless Sensor Nodes-Telos B and C-mote
Date: 27th Jul. 2016
Coordinators: Dr. S. Radha, Prof. & Head and Mr. S. Ramprabhu, Asst. Prof.
Sponsor: IEEE Communication Society
Speakers: Ms. Aasha Nandhini, Junior Research Fellow
Participants: 95 UG and PG students from all the departments

5.   Dr. K. T. Selvan, Prof. organized a talk by Writer Samas on behalf of SSN Good Citizenship Forum and Tamil Mandram

6.   FDP on Electromagnetics
Date: October 31 - November 4, 2016
Coordinators: Prof. Dr. K. T. Selvan, Asso. Prof. Dr. S. Joseph Gladwin &
Asst. Prof. Mr. S. Karthie
Sponsor: IEEE APS Madras Chapter
Speakers: Dr. R. K. Mishra, Behampur University; Dr. Amalendu Patnaik, IIT Roorkee; Dr. Harishankar Ramachandran, IIT Madras; Dr. Uday Khankhoje, IIT Madras; Dr. K. T. Selvan, SSN College of Engineering
Participants: 24 participants from various Engineering colleges

EVENTS ATTENDED

1.   Mr. S. Ramprabhu, Asst. Prof., attended workshop on "Advanced Antenna Technology" Thiagarajar College of Engineering, Madurai in association with IEEE APS Madras Chapter and IEEE AP/MTT Chapter- Kolkatta between 6th 10th Jun. 2016.

2.   Dr. M. Anbuselvi, Asso. Prof., attended seven day "Faculty Development

Training Program (FDTP) on Embedded and Real time systems" at St. Joseph's Institute of Technology between 6th 13th Jun. 2016.

3. Dr. S. Radha, Prof. & Head, attended IEEE SIGHT program at Eraviputhendurai on 27th Jun. 2016.

4. Dr. S. Radha, Prof. & Head, Dr. B. S. Sreeja, Asso. Prof., and Dr. S. Sakthivel Murugan, Asso. Prof., attended the one day Preliminary Discussion on DST Program Development meeting for an external funded project proposal held at AMET University on 23rd Jul. 2016.

5. Dr. N. Venkateswaran, Prof., attended GIAN Course on "MIMO wireless" organized by Department of ECE, Anna University between 8th 12th Aug. 2016.

6. Dr. S. Radha, Prof & Head attended the IEEE WIE Global Summit & R10 Congress from 24th to 27th Aug. 2016.

7. Dr. S. Sakthivel Murugan, Asso. Prof. attended "DST sponsored two day development programme meeting on

Indian Digital Heritage – A case study on Poompuhar and Dwaraka" organized by AMET University, Chennai on 25th and 26th Aug. 2016.

8. Dr. N. Edna Elizabeth, Prof. & Dr. R. Kishore, Asso. Prof., attended National Cyber Defense Summit 2016 organized by National Cyber Safety and Security Standards on 30th Sep. & 1st Oct. 2016.

9. On 7th Oct. 2016, Dr. M. Gulam Nabi Alsath, Asso. Prof. attended Keysight's Tech day.

10. Dr. S. Sakthivel Murugan, Asso. Prof. & Mr. I. Nelson, Asst. Prof. attended the Faculty development program on "Expectation and Future of IT Industry" at Cognizant Technologies Solution, MEPZ, Chennai on 22nd Oct. 2016.

11. Dr. N. Venkateswaran, Prof. attended the IEEE Region 10 Conference (TENCON 2016) organized by the IEEE Singapore Section chaired the sessions titled "Antennas, Propagation and Computational EM" on 24th Nov.2016 and "Image Processing" on 25th Nov. 2016.

Dr. N. Venkateswaran chaired the Antennas, Propagation and Computational EM session and Image Processing sessions at the IEEE Region 10 conference

PROFESSIONAL ROLES AND RECOGNITIONS

1.   Dr. S. Radha, Prof. & Head attended the monthly IEEE excom meeting.

2.   Dr. R. Amutha, Prof., conducted the Viva-voce exam for her research scholar Mr. S.Ganesh on June 6th at Sathyabama University.

3.   Dr. R. Jayaparvathy, Prof. attended DC meetings held during Jun. 3rd, 8th and   Aug. 6th at PSG College of Technology, Aditya Institute of Technology and Karpagam College of Engineering respectively.

4.   Dr. N. Venkateswaran, Prof., chaired a technical Session in the two day National conference RCVEWC 2016 held during Jun. 20-21, 2016.

5.   On 24th Jun. 2016, Mr. S. Ramprabhu, Asst. Prof., had discussion with Prof. Idichandy, IITM regarding the establishment of Innovation Centre.

6.   Mr. S. Ramprabhu, Asst. Prof., reviewed papers submitted to IEEE Transactions on Antennas and Propagation and IET Microwave Antennas and Propagation

7.   Dr. M. Gulam Nabi Alsath, Asso. Prof., reviewed articles for IEEE Antennas and Wireless Propagation Letters, IEEE Transactions on Industrial Electronics, ET Microwave Antennas and Propagation, IET electronic letters, Applied Computational Electromagnetics Society Journal & Journal of Electromagnetic   Waves   and Applications.

8.   Dr. K. T. Selvan, Prof., reviewed papers submitted to IEEE Transactions on Antennas and Propagation, IEEE Antennas and Propagation Magazine, IEEE Antennas and Wireless Propagation Letters, IETE Journal of Research & International   Journal of RF and Microwave Computer Aided Engineering.

9.   Dr. S. Sakthivel Murugan, Asso. Prof. reviewed a paper for Journal of Marine Engineering and Technology.

10.   Dr. K. T. Selvan, Prof., was appointed on the Editorial Board of Forum for Electromagnetic Research and Advanced Technologies (FERMAT), an online journal publishing articles from established researchers in the area of electromagnetics, and

published under the auspicious of University of Central Florida.

11.   Dr. R.Amutha, Prof., conducted the first Doctoral Committee meeting for her Full Time research scholar Ms. Jansi at Dept. of ECE, SSNCE on 2nd Jul. 2016.

12.   Dr. K. Muthumeenakshi, Asso. Prof., conducted the first Doctoral Committe meeting for her Full Time research scholar Ms. J. P. P. Jemimah at Dept. of ECE, SSNCE on 2nd Jul. 2016.

13.   Dr. N .Venkateswaran, Prof., conducted the synopsis meeting for his research scholar Mr. W. Jino Hans, Asst. Prof. on 14th Jul. 2016.

14.   Dr. S. Sakthivel Murugan, Asso. Prof., attended the DC meeting of Ms. M. Ponrajakumari as Doctoral committee member at Velammal Engineering College on 14th Jul. 2016.

15.   Dr. M. Gulam Nabi Alsath, Asso. Prof., conducted first DC meeting for his candidate Mr. V. Yokesh on 16th Jul. 2016.

16.   Dr. N. Venkateswaran, Prof., attended IETE executive meeting, Chennai Chapter on 26th Jul. 2016.

17.   Dr. N .Venkateswaran, Prof., conducted the synopsis meeting for his research scholar Ms. K. Anusudha on 26th Jul. 2016.

18.   Dr. M. Gulam Nabi Alsath, Asso. Prof., as Joint Supervisor of three research scholars in CEG attended the first DC meeting on 28th Jul. 2016.

19.   Dr. S. Esther Florence, Asso. Prof attended the Doctoral Committee meeting of Mrs. V Aruna PhD scholar Dr. Umma Habiba, Professor, Sri Venkateswara College of Engineering at the Department of ECE, Sri Venkateswara Engineering College on 29th Jul. 2016.

20.   Dr. S. Esther Florence, Asso. Prof. conducted the first Doctoral Committee meeting of her research scholars Mrs. J. Mary Suji Mol and Mrs. V. Vanitha on 28th & 29th Jul. 2016

21.   Dr. N .Venkateswaran, Prof., reviewed a paper submitted to the Indian journal of science and technology.

22.   Dr. S. Radha, Prof. & Head, presented Research Highlights of ECE department in RAC meeting held at Delhi on 3rd Aug. 2016.

23.   Dr. N. Venkateswaran, Prof., was an examiner for Ph.D viva voce examinatio for a doctoral student appointed by Hindustan University on 6th Aug. 2016.

24.   On 10th Aug. 2016, Dr. S. Radha, Prof. & Head, as a member of project advisory committee on Computer, Electronics & Mathematical Sciences evaluated the Indo–Netherland projects at IISC, Bangalore.

25.   Dr. B. S. Sreeja Asso. Prof., attended the DC meeting at Sri Venkateswara College of Engineering as DC member on 10th Aug. 2016.

26.   Dr. S. Joseph Gladwin, Asso. Prof. is appointed as a reviewer for 2016 IEEE Asia–Pacific Conference on Applied Electromagnetics, to be held in Malaysia during December 2016.

27.   Dr. S. Radha, Prof. & Head and Dr. K.T. Selvan, Prof., evaluated the 6 internal funded projects submitted by the faculty members along with the project evaluation committee members on 14th Sep. 2016.

28.   On 22nd Sep. 2016, Dr. P. Vijayalakshmi, Prof., and Dr. B. S. Sreeja, Asso. Prof., received the Best Teacher awards in the department for the academic year 2014–2015.

29.   Dr. S. Sakthivel Murugan, Asso. Prof received Best teacher award in the name of "Sahyog Teachers 2016 Award" by Redington at Ramakrishna Mission Student Home, Mylapore, Chennai on 23rd Sep. 2016.

30.   Dr.B.S.Sreeja Asso.Prof., conducted confirmation meeting for her research scholar Ms. C. Joshitha on 23rd Sep. 2016.

31.   Dr. R. Jayaparvathy, Prof. acted as an Expert member during the Academic Audit at B.S. Abdur Rahman University on 25th Sep. 2016.

32.   Dr. S. Radha, Prof. & Head, Dr. K. T. Selvan, Prof. & Dr. R. Amutha, Prof. along with project evaluation committee members evaluated 38 UG and 8 PG project proposals under internal funded project students. The ECE students presented their project proposals to the members in the meeting held at SSN Research Centre on 28th Sep. 2016.

33.   Dr. B. S. Sreeja Asso. Prof., conducted confirmation meeting for her research scholar   Ms. R. Chitha Devi on 30th Sep. 2016.

34.   Dr. R. Kishore, Asso. Prof. reviewed manuscripts for Computers and Electrical Engineering, Elsevier Journal.

35.   Dr. A. Jawahar, Prof. conducted the Ph.D confirmation meeting for his full time research scholar Ms. L. Sathyapriya at Dept. of ECE on 7th Oct. 2016.

36.   Dr. S. Radha, Prof. & Head and Dr. Edna Elizabeth, Prof. along with committee members evaluated the review of faculty internally funded projects on 13th Oct. 2016.

37.   Dr. S. Radha, Prof. & Head, Dr. S. Joseph Gladwin, Asso. Prof. and Mr. S. Karthie, Assist. Prof. attended IEEE day celebrations at Anna University on 15th Oct. 2016. Dr. S. Joseph Gladwin received Certificate of Appreciation during this event.

38.   Dr. S. Radha, Prof. & Head, reviewed the papers for IEEE Students Paper Contest, IEEE SPC 2016 organized by IEEE Madras Section on 16th Oct. 2016.

39.   Dr. S. Radha, Prof. & Head, reviewed the paper titled "Energy conservation in Wireless Sensor Networks using IWMAC: Invite and Wait MAC Protocol" for KSII Transactions on Internet and Information Systems journal.

40.   Dr. A. Jawahar, Prof/ECE attended the 12th Meeting of the Academic Council held at VELS University, Pallavaram, Chennai on 21st Oct. 2016.

41.   Dr. S. Radha, Prof & Head chaired the session as judge in IEEE Students Paper Contest, IEEE SPC 2016 organized by IEEE Madras Section at Vel Tech, University, Avadi on 22nd Oct. 2016.

42.   Dr. S. Radha, Prof. & Head attended the DC meeting at Adiparasakthi Engineering College, Melmaruvathur on 25th Oct. 2016.

43.   Dr. S. Radha, Prof. & Head, Mr. C. Vinothkumar, Asst. Prof. and Mr. C.Thiruvenkatesan, Asso. Prof. coordinated the ISO re-certification audit on 25th Oct. 2016.

44.   Dr. R. Rajavel, Asso. Prof. attended the DC meeting as DC member for the candidate Mr. K. Dineshkumar at School of Computing Science and Engineering, VIT University Chennai on 26th Oct. 2016.

45.	Dr. S. Radha, Prof. & Head as subject expert conducted Ph.D. Viva Voce at Easwari Engineering College, Chennai on 26th Oct. 2016.

46.	Dr. N. Venkateswaran, Prof. reviewed papers for International Conference on Advances on Computational Intelligence in Communication (CIC, Oct - 2016) held at Pondicherry Engineering College, Pondicherry.

47.	Dr. R. Jayaparvathy, Prof. reviewed articles submitted to Journal of Experimental Agriculture, Science Domain International during Oct. 2016.

48.	Dr. R. Jayaparvathy, Prof. is elected as a Technical Committee Member, International Conference on Electrical Electronics Instrumentation and Computer Communication 2016, Karpagam College of Engineering.

49.	Dr. B. S. Sreeja, Asso. Prof., reviewed articles for IEEE Antennas and Wireless Propagation Letters, IEEE Transactions on Very Large Scale Integration Systems, Microelectronics Journal, and Microsystem technology.

50.	Dr. B. S. Sreeja Asso. Prof., has been selected as International Advisory Committee member for EMN Meeting on MEMS to be held in Egypt during December 12-16 2016.

51.	Dr. R. Rajavel, Asso. Prof. acted as a DC member for the comprehensive viva-voce examination for Ms. Sola Usha Rani, an Internal Part-time Ph.D. registrant in the School of Computing Science and Engineering, VIT University Chennai Campus on 3rd Nov. 2016. He also attended the DC meeting of a PhD scholars at Vels University on 15th and 16th Nov. 2016.

52.	Dr. S. Radha, Prof. & Head, Mr. C. Vinothkumar, Asst. Prof. and Dr. B. S. Sreeja, Asso. Prof. prepared and submitted the required data in the prescribed format to the Principal for NIRF data submission.

53.	Dr. S. Radha, Prof.& Head, Dr. P. Vijayalakshmi, Prof. and Dr. C. Premanand, Prof., attended the Anna University Syllabus (R-2017) Subcommittee meeting held at CEG, Anna University.

54.	Dr. S. Radha, Prof.& Head evaluated the abstracts submitted by Ph.D scholars of EEE, ECE, CSE, IT & BME department for Doctorate Scholars Day Celebrations and submitted the report to Dean, Research.

55.   Dr. S. Radha, Prof. & Head, as DC member, attended synopsis meeting at MIT, Chennai on 23rd Nov. 2016.

56.   Dr. Premanand Chandramani, Prof/ECE attended a DC Confirmation meeting as a DC member for a PhD Scholar at SENSE School, VIT Chennai on 24th Nov. 2016.

57.   Dr. S. Radha, Prof. & Head, prepared and submitted the progress report for the project sanctioned under DST FIST scheme on 25th Nov. 2016

58.   Dr. S. Esther Florence, Asso. Prof. reviewed papers received for IEEE INAE EM Symposium to be held during December 12-13, 2016.

59.   Mr. S. Ramprabhu, Asst. Prof. and Dr. S. Sakthivel Murugan, Asso. Prof. reviewed 2 papers for the International Conference ICCCSP 2017.

60.   Dr. K. T. Selvan, Prof. reviewed 3 doctoral applications submitted for IEEE AP-S research scholarships.

61.   Dr. Nandita L, Asso. Prof., reviewed a paper submitted to IEEE Transactions on Communications.

62.   Dr. P. Vijayalakshmi, Prof. conducted viva-voce examination for her Ph.D Scholar Ms. B. Ramani, Asst. Prof. on 27th Oct. 2016.

63.   Dr. P. Vijayalakshmi, Prof. reviewed 5 papers submitted to IEEE - TENCON 2016

RESEARCH NEWS

SANCTIONED EXTERNAL PROJECTS

1.   Dr. T. Nagarajan, Prof. & Head / IT and Dr. P. Vijayalakshmi, Prof., are sanctioned with the project titled "HMM-based Text-to-Speech synthesis system for Malaysian Tamil" sanctioned by Murasu Systems Sdn Bhd, Malaysia worth Rs. 4 Lakh for a duration of 6 months.

PROPOSALS & PRESENTATIONS

1.   Dr. S. Radha, Prof. & Head, and Dr. B. S. Sreeja, Asso. Prof., along with Ms. Jemmima Ebenezer, SG F, IGCAR submitted a proposal entitled "Omni-Directional to Directional Pattern Switching Patch Antenna for Wireless Sensor Nodes at Reactor Containment Building" worth Rs. 27 Lakhs under Regular Research Projects Scheme to BRNS.

2.   Dr. P. Vijayalakshmi, Prof. and Dr. T. Nagarajan, Prof. & Head/IT presented their DST-TIDE project titled "Speech-Input Speech-Output Communication Aid (SISOCA) for speakers with cerebral palsy" at the 13th Meeting of the Programme Advisory and Monitoring Committee (PA & MC) of Technology Interventions for Disabled and Elderly (TIDE) programme held at Bangalore on 15th July 2016.

3.   Dr. N. Edna Elizabeth, Prof., Dr. R. Kishore, Asso. Prof., Dr. S. Radha, Prof. and Head, submitted a proposal titled "Secured Smart Card Transport System for Smart Cities" worth Rs. 46.42 Lakhs to DST-SERB under Extra Mural Research Funding Scheme on 29th Jul. 2016.

4.   Dr. R. Amutha, Prof., and Dr. R. Kishore, Asso. Prof., submitted a proposal titled "Sparse based Image Fusion for Video Surveillance Applications" worth Rs. 11,49,500 to DST-SERB under Extra Mural Research Funding Scheme on 29th Jul. 2016.

5.   Dr. S. Radha, Prof. & Head & Dr. R. Hemalatha, Asso. Prof., in collaboration with CSIR-CEERI, Chennai & Pilani submitted a proposal titled "Development of a low cost Disease Management system using WVSN for Green house Cultivation" worth Rs.71.25 Lakhs to DST-SERB on 31st Jul. 2016.

6.   Dr. S. Sakthivel Murugan, Asso. Prof., submitted a proposal worth Rs.32 lakhs for funding titled "Study, Analysis, Modelling and Forecast of Submerged Objects Due to Sediment Transportation - Poompuhar & Dwaraka" to DST.

7.   Dr. S. Radha, Prof. & Head and Dr. R. Hemalatha, Asso. Prof., submitted a draft proposal to conduct workshop on "IoT for industrial applications" in association with CSIR-CEERI, Pilani & Chennai to Director, CSIR.

8.   On 3rd Sep. 2016, Dr. P. Vijayalakshmi, Prof., gave a project presentation under SSN-BEST category "Sign language to speech translation in Tamil" during the inauguration of SSN Incubation and Innovation centre to Dr. Shiv Nadar and team. Also, 3 projects were presented by ECE students during the inauguration.

9.   On 28th Sep. 2016, Dr. S. Esther Florence, Asso. Prof., presented a proposal titled "Design and Development of a Computer Controlled System for the Production of Textile Antennas and Sensors" worth Rs. 24 Lakhs to DST SERB   for   Extra   Mural Research Funding at IIT-Madras.

10.   "MEMS based automated insulin delivery system" is selected as top 10 research with potential to transform their innovation into market innovations under Academia – Industry Training – 2016 program sponsored by DST, WISSNEX INDIA, a consulate General of Switzerland and SINE Business Incubation of IIT, Bombay. The inventors of the product are Ms. C. Jositha, Research Scholar, Dr. B.S. Sreeja, Asso. Prof., and Dr. S. Radha, Prof. & Head. The advisors are Dr. V. Sampath, IIT-M and Dr, Ashis Kumar Sen, IIT-M.

11.   Dr. N. Venkateswaran, Prof., & Ms. K. Madeshwari, Asst. Prof./CSE submitted a project titled, "Fusion Algorithms for Multispectral and PAN images in Cartographic Applications" worth Rs. 11.50 Lakhs to RESPOND, ISRO.

12.   Dr. S. Radha, Prof. & Head and Dr. R. Hemalatha, Asso. Prof., submitted a research proposal titled "Efficient Decision Support System for Paddy plant using WMSN" worth Rs.13.79 Lakhs to TNSCST.

13.   Dr. S. Sakthivel Murugan, Asso. Prof. submitted a project proposal titled "Implementation of MI based wireless underground sensor system for smart irrigation" worth Rs. 7.43 Lakhs   to TNSCST.

14.   Dr. R .Srinivasan, Prof./IT (PI), Dr. Premanand V. Chandramani, Prof. (Co-PI) & Dr. K. K. Nagarajan, Asso. Prof. (Co-PI) submitted a project proposal titled "Radiation Mitigation Topologies for Analog / RF Front End Circuits in Transceivers" worth Rs. 49.21 Lakhs to DST-SERB and completed the presentation at IIT Madras.

15.   Dr. R .Srinivasan, Prof./IT (PI), Dr. Premanand V. Chandramani, Prof. (Co-PI) & Dr. K. K. Nagarajan, Asso. Prof. (Co-PI) submitted a project proposal titled "Improving Soft Error resiliency of SRAMs in Conventional and Content Addressable Memories Using SiGe- HBT: Design and Prototype Validation nodes" worth Rs. 45.21 Lakhs to DRDO.

16.   Dr. K. K. Nagarajan, Asso. Prof. (PI) & Dr. R .Srinivasan, Prof./IT (Co-PI) submitted   a project proposal titled "Energy harvesting from footsteps" worth Rs. 3.105 Lakhs to TNSCST.

17. Dr.R.Rajavel, (PI), Dr.A.Jawahar, (Co-PI), Dr.Elizabeth Elias (Co-PI, NIT-K), and submitted a project proposal titled "Design and DSP Implementation of Reconfigurable Digital Hearing Aid Using Variable Bandwidth Filters", worth Rs. 12,00,000/- to DST-CSRI

18. Dr. S. Radha, Prof. & Head, Dr. K. Muthumeenakshi, Asso. Prof, Ms. S. Kirubaveni, Assist. Prof, Dr.P.Ramasamy, Dean Research along with Ms. Jemmima Ebenezer, SG F, IGCAR submitted a proposal entitled "Prototype development of Integrated RF and Vibration Energy Harvester for Wireless Sensor Network Applications" worth Rs. 39 Lakhs under Regular Research Projects Scheme to BRNS.

19. Dr. S. Sakthivel Murugan, Asso. Prof. submitted a proposal titled "Design, Development and Prototype Implementation of Underground Communication using Magnetic Induction for Smart Irrigation" worth Rs.8.54 Lakh to DST.

20. Dr. M. Gulam Nabi Alsath, Asso. Prof. and Mr. S. Ramprabhu, Asst. Prof. presented their project titled "An Integrated Multi-standard Antenna for Automotive Communications" to the expert members of TATA ELXSI during the meeting held at TATA ELXSI, IIT-M Research Park on 28th Nov. 2016.

21. Dr. S. Sundaravadivelu, Prof. submitted a research proposal titled "LIDAR systems development for fast productive ground based surveys of dams, power plants, chemical plants and industries, buildings and transportation infrastructures" worth Rs.37.48 Lakh to Media Lab Asia, New Delhi, India for a duration of 3 years.

22. Dr. S. Sundaravadivelu, Prof/ECE submitted a research proposal titled "Development of LIDAR systems for navigation and weather data" worth Rs.25.48 Lakh to Naval Research Board, New Delhi, India for a duration of 3 years.

INTERNAL FUNDED PROJECTS (BY SSN TRUST)

1. Dr. S. Sakthivel Murugan, Asso. Prof., "Facility enhancement of underwater acoustic research laboratory," worth Rs. 3.4 Lakhs.

2. Dr. B. S. Sreeja, Asso. Prof., Dr. S. Radha, Prof., "Electromagnetic infrared energy harvester on flexible substrate," worth Rs. 2.13 Lakhs.

3. Dr. M. Anbuselvi, Asso. Prof., Dr. P. Saravanan, Asso. Prof./EEE, "Battery operated autonomous vehicle with IoT," worth Rs. 2.91 Lakhs.

BOOK COVERS

1.   Dr. S. Radha, Prof. & Head, Dr. R. Hemalatha, Asso. Prof and Ms. S. Aasha Nandhini, SRF, "Compressive Sensing for Wireless Communication: Challenges and Opportunities," River publishers.

2.   Dr. S. Radha, Prof. & Head, Dr. R. Hemalatha, Asso. Prof. and Ms. S. Aasha Nandhini, SRF, "Efficient Anomaly Detection System for Video Surveillance Application in WVSN with Particle Swarm Optimization" to be published in Springer International Publishing AG in the Book titled "Computational Intelligence in Wireless Sensor Networks".

JOURNAL ARTICLES

1.   Mr. W. Jino Hans, Asst. Prof., Dr. N. Venkateswaran, Prof., Mr. N. Srinath and Mr. Sandeep Ramachandran, UG students, "Estimation of Higher-order Regression via. Sparse Representation Model for Single Image Super-resolution Algorithm," International Journal on Applied Mathematics & Information Sciences, vol. 10(5), pp 1-10, 2016.

2.   Mr. C. Annadurai, Asst. Prof., and Mr. A. Mani Muthu Raja, Research Scholar, "Energy Efficient Cooperative Positioning Algorithm for Global Navigation Satellite System," Asian Journal of Research in Social Sciences and Humanities, vol. 6(7), Jul. 2016, pp. 266-275.

3.   Ms. M. P. Actlin Jeeva, (Research Scholar/JRF), Dr. T. Nagarajan, Prof. & Head/IT, Dr. P. Vijayalakshmi, Prof., "DCT derived spectrum-based speech enhancement algorithm using temporal-domain multiband filtering," IET Signal Processing, vol. 10 (8), pp. 965-980, 2016.

4.   Ms. V. Sangeetha, (Research Scholar/CEG), Ms. Saffrine Kingsley (PG Scholar/ CEG),   Dr. K. Malathi, (Faculty/CEG), Dr. M. Gulam Nabi Alsath, Asso. Prof, Ms. P. Yogeshwari, (PG Scholar/CEG), Ms. S. Sangeetha, (PG Scholar/CEG) published a paper titled "Quad-Band Rat-Race Coupler with Suppression of Spurious Pass-Bands," IEEE Microwave and Wireless Components Letters, vol. 26, no. 7, pp. 490-492, Jul. 2016

5.   Mr. C. Annadurai, Asst. Prof. and Dr. V. Nagarajan, Prof./AEC, "Performance Analysis for Cooperative Ad-hoc Networks in the Presence of Correlated Nakagami Fading," Springer Wireless Personal Communications, August 2016.

6. Dr. N. Venkateswaran, Prof., Mr. S. Saranraj, Research Assistant and Mr.S.Sudharsan.(PG-CS), "Illumination Invariant Feature Extraction for Multispectral Palmprint Verification" in the International Journal of Applied Information Systems, vol. 11(3), pp.11-20, 2016.

7. Mr. W. Jino Hans, Asst. Prof., Dr. N. Venkateswaran, Prof., Mr. Srinath Narayanan & Mr. Sandeep Ramachandran, UG Students, "Sparse Representation based Higher-order Regression Model for Single Image Super-resolution Algorithm" Journal Applied Mathematics and Information Sciences, vol. 10(5), pp. 1971-1981, 2016.

8. Sandeep Kumar, P, Research Scholar/CEG ;Yogeshwari, P, PG Scholar/ CEG; Kanagasabai, Malathi Faculty/CEG; Alsath, M.G.N. Asso. Prof./SSN; Saffrine, Kingsley, PG Scholar/CEG; Sangeetha, S, PG Scholar/CEG; "3D Eight-port U l t r a – wideband (UWB) Antenna Array for Diversity Applications," IEEE Antennas and Wireless Propagation Letters (ISSN: 1536-1225), pp. 1   4; 2016.

9. Alsath, M.G.N., Asso. Prof.; Kanagasabai, Malathi, Faculty/CEG;"Ultra-Wideband Grid Array Antenna for Automotive Radar Sensors", IET   Microwaves, Antennas & Propagation, pp. 1   8; 2016.

10. Pakkathillam, J.K., Research Scholar/CEG; Kanagasabai, Malathi, Faculty/CEG; Alsath, M.G.N., Asso. Prof.; "A Compact Multiservice UHF RFID Reader Antenna for Near field and Farfield Operations," IEEE Antennas and Wireless Propagation Letters, pp. 1   4; 2016

11. Rajesh, N. Research Scholar/CEG, Kanagasabai, Malathi, Faculty/CEG ;Alsath, M.G.N., Asso. Prof.;"Dual Mode Antipodal Vivaldi Antenna", IET Microwaves, Antennas & Propagation, pp. 1- 8, 2016.

12. Ms. K. Madeshwari, Asst. Prof.,/CSE and Dr. N. Venkateswaran, Prof., "Swarm intelligence based optimisation in thermal image fusion using dual tree discrete wavelet transform" Quantitative Infrared Thermography Journal, Sep 2016.

13. Ms. K. Madheswari, Asst. Prof./CSE and Dr. N. Venkateswaran, Prof., "An Optimal Weighted Averaging Fusion Strategy for Thermal and Visible images using Dual Tree Discrete Wavelet Transform and Particle Swarm Optimization," Multimedia   Tools and Applications (Springer), Oct 2016.

14. Ms. K. Nirmala, Asst. Prof./BME and Dr. N. Venkateswaran, Prof., "Local Binary Pattern Features based Detection of Glaucoma using SVM Classifier," Journal of

Medical Imaging and Health Informatics, American Scientific Publishers, vol. 6, pp. 1-9, 2016.

15. Ms. Chithradevi R, Research Scholar, Ms. Nafiza R, PG Scholar, Dr. B. S. Sreeja, Asso. Prof. and Dr. S. Radha, Prof., "Compact Modified T Slot Circular Patch Quad Band Antenna for MIMO", International Journal of Microwave and Wireless Technologies, pp. 1 9, 2016.

16. Ms. Chithradevi R, Research Scholar, Ms. Nafiza R, PG Scholar, Dr. B. S. Sreeja, Asso. Prof. and Dr. S. Radha, Prof., "Compact Mushroom Cut Performance diversity antenna," Microwave and Optical Technology Letters, John Wiley Publications, Nov. 2016.

17. K. S. Senthil Kumar, Research Scholar, Dr. R. Amutha, Prof., "An Algorithm for Energy Efficient Cooperative Communication in Wireless Sensor Networks," KSII Transactions on Internet & Information Systems, vol. 10 (7), pp 3080- 3099, 2016.

18. Sathyapriya L (Research scholar) and Jawahar A (ECE Faculty), "Fault Management using Modified RAT for Wireless Sensor Networks" Int J Adv Engg Tech, vol. 7(1), pp.391-395, 2016

19. Mr. C. Vinoth Kumar, Asst. Prof. and Dr. V. Natarajan, Prof./MIT, "Hybrid local prediction error-based difference expansion reversible watermarking for medical images", Computers and Electrical Engineering, Vol. 53, pp. 333-345, Jul. 2016.

20. Ms. K. Nirmala, Asst. Prof., Dr. N. Venkateswaran, Prof., Mr. C. Vinoth Kumar, Asst. Prof., "Kernel SVM Classifier for Detection of Glaucoma Using LBP Based Fractal Features", Asian Journal of Information Technology, vol. 15(15), pp. 2702 2708, Oct. 2016.

21. Ms. S. Subbaraj, PG Scholar/CEG, Mr. V. S. Ramalingam, Asst. Prof./Mech., Dr. M. Kanagasabai, Prof./CEG, Dr. E. F. Sundarsingh, Ms. Y. P. Selvam, PG Scholar/CEG and Ms. S. Kingsley, PG Scholar/CEG;"Electromagnetic Nondestructive Material Characterization of Dielectrics Using EBG Based Planar Transmission Line Sensor," in IEEE Sensors Journal, vol. 16, no. 19, pp. 7081-7087, Oct.1, 2016.

22. Ms. V. Sherlin Solomi, Full-time research scholar/IT, Dr. P. Vijayalakshmi, Prof. and Dr. T. Nagarajan, Prof. & Head, "Exploiting Acoustic Similarities Between Tamil and Indian English in the Development of an HMM-based Bilingual Synthesizer" IET Signal Processing, November 2016, pp.1-19. DOI: 10.1049/iet-spr.2016.0163

23.　Ms. K. Nirmala, Asst. Prof./BME, Dr. N. Venkateswaran, Prof. and Mr. C. Vinoth Kumar, Asst. Prof., "Kernel SVM Classifier for Detection of Glaucoma Using LBP Based Fractal Features" Asian Journal of Information Technology, vol.15 (15),　pp. 2702–2708, 2016.

CONFERENCE PRESENTATIONS

1.　Dr. S. Sakthivel Murugan, Asso. Prof., "Design and Implementation of an energy harvesting system using MFC with marine sediments for underwater applications" in the 4th International conference on Oceanography and Marine Biology–Oceanography 2016" held at Brisbane, Australia on 18th and 19th Jul. 2016. The paper received Best poster award.

2.　Dr. S. Sakthivel Murugan, Asso. Prof., "Performance analysis of energy efficiency　cross layer protocol for underwater acoustic wireless sensor networks" in the 4th International conference on Oceanography and Marine Biology–Oceanography 2016" held at Brisbane, Australia on 18th and 19th Jul. 2016.

3.　Ms. V. Sherlin Solomi, Senior project officer/Research scholar (IT), Ms. G. Anushiya　Rachel, Project officer/Research scholar (IT),　Dr. P. Vijayalakshmi, Prof,　Dr. T. Nagarajan, Prof. & Head/IT "Phone Mapping–based Mixed–language synthesizer for Tamil and Indian English" in the 15th Tamil Internet Conference held at Gandhigram Rural University, Dindigul from 9th - 11th Sep. 2016. The paper received Best paper award.

4.　Ms. K. Mrinalini, JRF/Research scholar, Dr. P. Vijayalakshmi, Prof., "LID based post–editing for Tamil Machine Translation System" in the 15th Tamil Internet Conference held at Gandhigram Rural University, Dindigul from 9th -11thSep. 2016.

5.　Dr. S. Radha, Prof. & Head "Precision Capacitance Readout Electronics For　Micro Sensors using Programmable System on Chip" in the 1st International Conference on Applied Soft Computing and Communication Networks held at Jaipur from 21st　23rd Sep. 2016.

6.　Ms. J. Florence Gnana Poovathy, JRF/Research Scholar, Dr, S. Radha, Prof. & Head, "Reconstruction of surveillance videos by Non–Iterative Pseudo Inverse based Recovery Algorithm (NIPIRA): A subjective Experience" in the IEEE International Conference on Advances in Computing, Communications and Informatics organized by LNM Institute of Information Technology (LNMIIT), Jaipur from 21st　24th Sep. 2016.

7.   Ms. G. Padmalaya, Research Scholar, Dr. B. S. Sreeja, Asso. Prof., Mr. E. Manikandan, Research Scholar, Dr. S. Radha, Prof., "Synthesis and Characterization of Magnetite based nanocomposites and their chromium ions removal behavior", International Conference on Nanoscience and Nanotechnology (ICNAN'16), VIT University, Vellore, October 19–21, 2016. The paper received Best paper award.

8.   Ms. Apeksha Avinash, IV ECE, Magesh K, IV ECE, Mr. C. Vinoth Kumar, Asst. Prof., "SIFT Feature based Detection of Glaucoma", International Conference on Recent Innovations in Electrical, Electronics, Computer and Mechanical Engineering (ICRIEECME-2016), pp. 11-14, Oct 29, 2016

9.   Ms. T. A. Mariya Celin, JRF, Dr. T. Nagarajan, Prof & Head/IT and Dr. P. Vijayalakshmi, Prof. "Dysarthric speech corpus in Tamil for rehabilitation research" in IEEE TENCON 2016, Singapore, pp. 2612-2615, Nov 2016.

10.   Ms. K. Mrinalini, JRF/ECE, Ms. G. Sangavi, M.E. (AE; 2014-2016 batch), Dr. T. Nagarajan, Prof & Head/IT and Dr. P. Vijayalakshmi, Prof. presented the paper titled "Performance Improvement of Machine Translation System using LID and Post-editing" in IEEE TENCON 2016, Singapore, pp. 2136-2139, Nov 2016

11.   Edna Elizabeth.N, Prof., Nivetha S (BE: 2012-2016 batch), "Design of a Two-factor Authentication ticketing system for Transit Applications" in IEEE TENCON 2016, Singapore, pp. 2499-2504, Nov 2016.

12.   Ms. K. Madheswari, Asst. Prof./CSE , Dr. N. Venkateswaran, Prof, and V.Sowmiya (Student– SASTRA), "Fusion of Visible and Thermal images using Curvelet Transform and Brain Storm Optimization ", in IEEE TENCON 2016, Singapore, pp. 2828-2831, Nov 2016

13.   Dr. N. Venkateswaran, Prof. and C. Ashok (PG Scholar), " Direction of Arrival (DOA) Estimation of near field sources using support vector regression", in IEEE TENCON 2016, Singapore, pp. 1573-1579, Nov 2016.

Prof. Edna Elizabeth on "Design of a Two-factor Authentication ticketing system for Transit Applications"

CONSULTANCY

1. Dr. S. Radha, Prof. and Head, Dr. M. Gulam Nabi Alsath, Asso. Prof., Dr. S. Esther Florence, Asso. Prof., and Mr. S. Ramprabhu Asst. Prof. carried out a consultancy for Rs. 5750/- through Dielectric Measurements Kit, a part of RF and Microwave measurements lab for Mr. Thirumaraiselvan, Adhiparasakthi Engineering College on 16th Jul. 2016.

2. Dr. S. Sakthivel Murugan, Asso. Prof., completed a consultancy work for Rs. 5750 through Underwater acoustic research lab for Ms. Kalpana, Research scholar Sathyabama University on ambient noise collection and classification process on 26th Sep. 2016

3. Dr. S. Sakthivel Murugan, Asso. Prof/ECE carried a consultancy work to SRM University for Rs. 5750 through Underwater acoustic research laboratory on 6th Oct. 2016.

FACULTY UPDATES

1.   Mr. C. Annadurai, Asst. Prof. successfully defended his doctoral dissertation on the "Investigations on the error performance of the cooperative ad-hoc networks" at the Department of ECE, Adhiparasakthi Engineering College, Melmaruvathur on 22nd September.

**MR.C.ANNADURAI
ASST. PROF.**

Supervisor: Dr. V. Nagarajan, Prof., Adhiparasakthi Engineering College

Abstract:

        Cooperative ad-hoc networks are an emerging technology for reliable and high data rate communication in portable devices. Conventionally, a lot of efforts have been made to combat the channel fading. Diversity is a promising solution for providing reliable communication between two mobile nodes in wireless communication. It mitigates adverse effects of the fading. Among the several forms of diversity, spatial diversity is a popular form in which multiple antennas are deployed either in the transmitter side or receiver side or at both. Achieving, transmit diversity in a mobile node increases its size, cost and order of complexity. To overcome this difficulty, the recent developments in wireless communication proposes the distributed spatial diversity, where single antenna mobile nodes which are distributed in different geographical locations share their antennas to form an array of antennas. The basic network model consists of an origin node an intermediate node and final node. In the intermediate node, a DF protocol which has the ability to regenerate the original node information and forwarding to the final node is adopted. In this thesis the performance of a cooperative ad-hoc network with DF protocol has been investigated. Three new contributions have been proposed to bring out the performance quantitatively. Algorithms have been developed for investigation of the Symbol Error Probability (SEP) of the three contributions.

2. Ms. B. Ramani, Asst. Prof. successfully defended her doctoral dissertation on the "A multilingual to polyglot speech synthesizer for Indian languages using cross-lingual voice conversion" at the Department of ECE, on 27th Oct. 2016.

MS.B.RAMANI
ASST. PROF.

Supervisor: Dr. P. Vijayalakshmi, Prof., SSNCE

Abstract:

A text-to-speech (TTS) synthesis system aims at generating high quality synthesized speech for any given input text. In India, multiple languages co-exist and there arises a need to have a single synthesizer, called multilingual synthesizer, which synthesizes speech for any given monolingual or mixed-language text. However, for a mixed-language text, as speech data are usually collected from native speakers to avoid foreign accent, synthesized speech shows speaker switching at language switching points. To overcome this, the thesis focuses on developing a polyglot speech synthesizer using polyglot speech corpus (all the speech data in a single speaker's voice) obtained using cross-lingual voice conversion (CLVC) technique. A polyglot synthesizer is developed for four regional Indian languages and a foreign language namely, Tamil, Telugu, Hindi, Malayalam, and Indian English. Further, a technique is proposed to alleviate the oversmoothing effect in GMM-based voice conversion technique, by using (source) language-specific mixture weights in a multi-level GMM followed by selective pole focusing in the unvoiced speech segments.
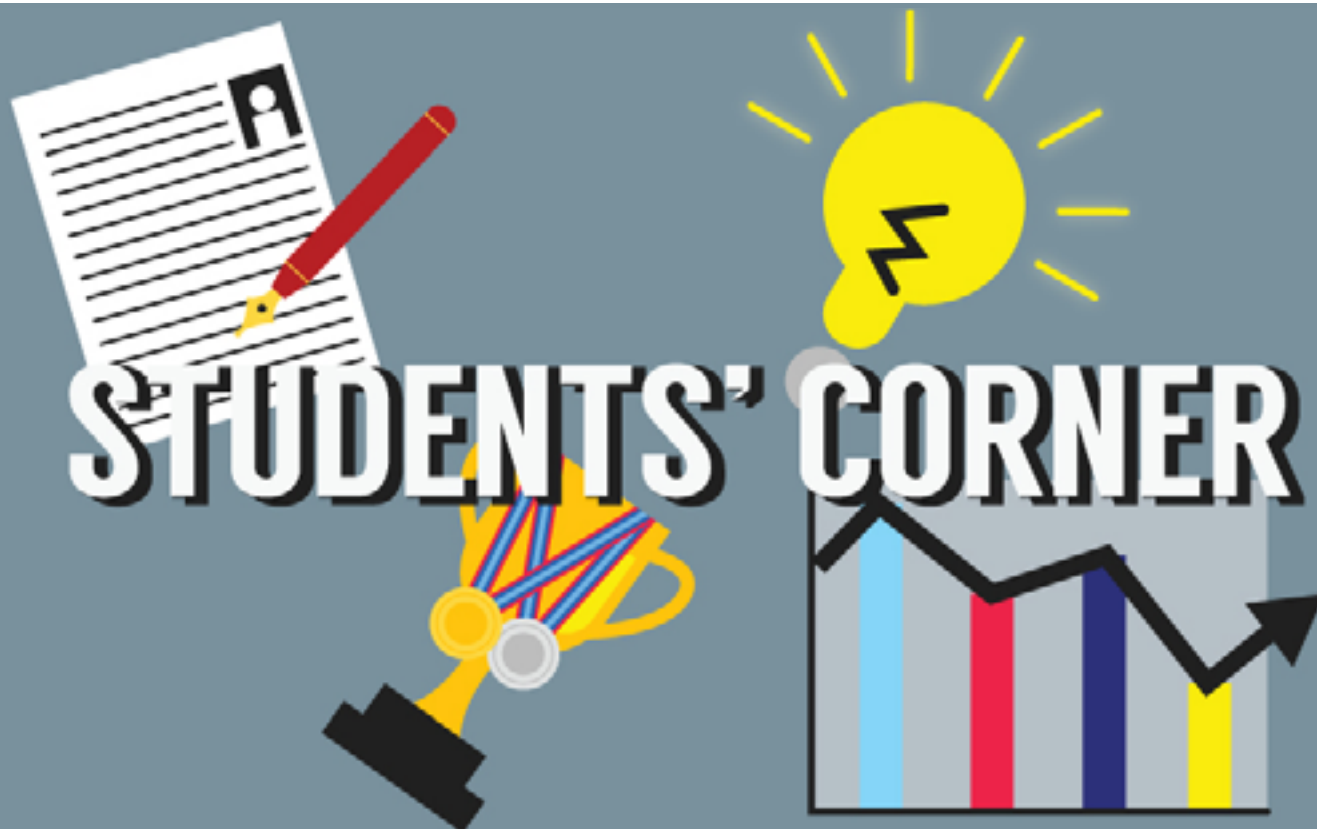
UNIVERSITY RANK HOLDERS

Anna University released the Rank List for the year 2016. SSN Institutions bagged 132 University ranks and the Department of ECE bagged 32 University ranks. A more detailed statistics of the rank holders produced by DECE is given in the Chart below. The Faculty team congratulates the rank holders and young graduates.

UG RANK HOLDERS

S.NO.	NAME	CGPA	RANK
1	VARSHA S	9.42	1
2	SRIVIDYA N	9.23	8
3	APARNAA RAMANATHAN	9.15	14
4	VARSHINI TN	9.11	18
5	ANJANA KRISHAN	9.11	18
6	AISHWARYA ASHOK	9.07	22
7	KARTHIK MS	8.85	44
8	VINOTHA RK	8.84	45
9	SRINATH N	8.83	46
10	RUTHIRAN B	8.82	47

11	KAVYA S	8.81	48
12	VARUSHINI R	8.79	50
13	SRIPRIYA R	8.79	50

PG RANK HOLDERS

APPLIED ELECTRONICS

S.NO	NAME	CGPA	RANK
1	SUDHA M	8.97	5
2	SANGAVI G	8.87	10
3	AKSHAYA V	8.78	15
4	APARNA V	8.75	16
5	NARAYANE R	8.64	24

COMMUNICATION SYSTEMS

S.NO	NAME	CGPA	RANK
1	ASHOK C	8.86	12
2	MERALINE SELVARAJ	8.71	22
3	ROOBINI A	8.70	23
4	HARIPRIYA S	8.68	24
5	SAYI SOUNDARIYA S	8.62	28
6	AARTHI M	8.55	33
7	ABIRAMI S	8.49	37
8	VINITHA J	8.48	38

VLSI DESIGN

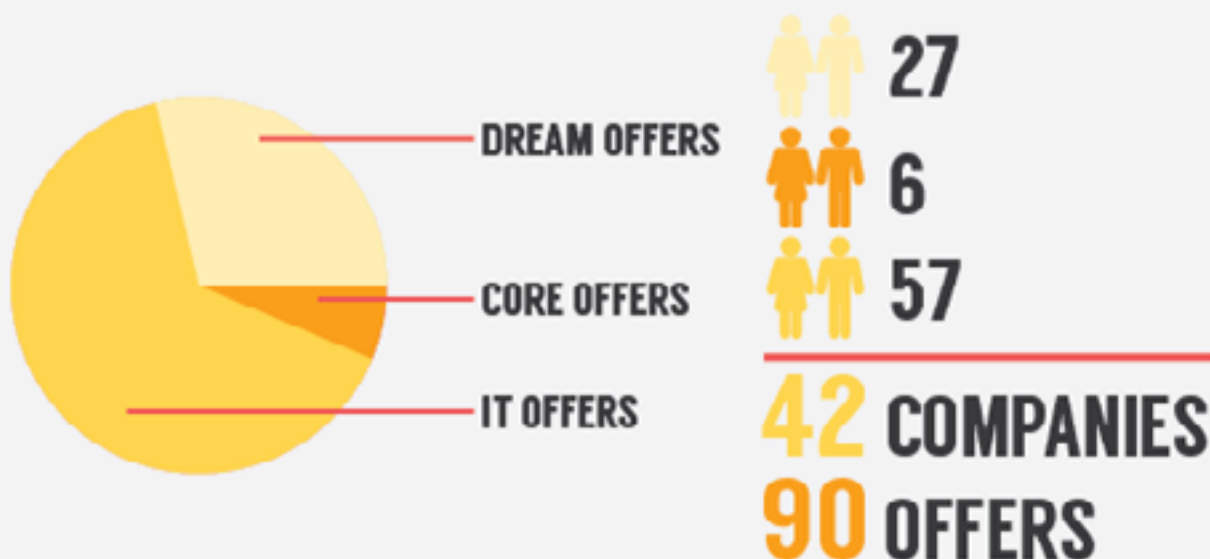| S.NO	NAME	CGPA	RANK
1	VIGNESH N	8.87	14
2	ELAKKIYA E	8.84	16
3	SASIKALA P	8.68	26
4	V PAVAN KUMAR REDDY	8.54	33
5	GURU SESHADHRI G R	8.56	34
6	ANI MELFA ROJI M	8.51	37

PLACEMENT DIARIES

PG PLACEMENTS

The department is happy to inform that our PG students have started their placement account with 20% of Applied Electronics, 14.3 % of Communication system and 3.2 % of VLSI students placed through campus recruitment process.

To initiate more placement activities for PG, the PG placement Department coordinator Dr. S. Sakthivel Murugan has periodic discussion with students and several Industrial projects, Internship programs are initiated. The activities are listed below.

1.   Dr. S. Sakthivel Murugan initiated the industry-institute interaction with
        Mr.   R. Thirumavalavan, Deputy Manager, Research and Development, Manat
        ech Pvt Ltd on 5th Oct. 2016. The outcome of the discussion has paved way
        for sharing of technology and students in terms of job, internship etc for
        PG students. He has also extended his support for our PG students on require
        ment for immediate placement for passed out alumnus, Industrial Project and
        Internship.

2.   Dr. S. Sakthivel Murugan has organized an awareness program on pre- place
        ment training and importance of certification courses for PG students on 20th
        Oct. 2016.

3.   Dr. S. Sakthivel Murugan invited Mr. V. Soubbaya, Managing Director, Dynam
        ic Networking Institute who addressed with the PG students on the essential
        skill-sets required and the expectations of corporate from Engineers.

4.   Dr. S. Sakthivel Murugan created "PG ECE SSN ALUMNUS" group through
        hike messenger for close interaction and development of alumni network.

PLACEMENT REPORT 2016

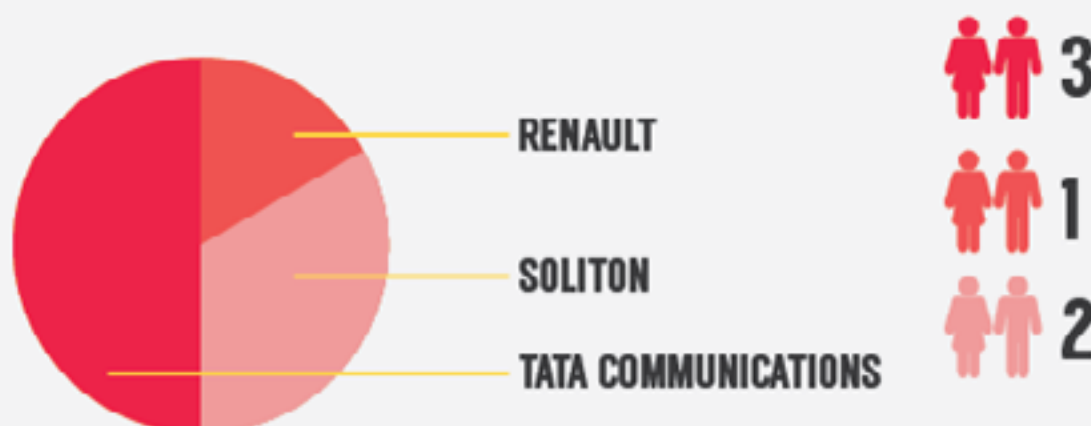## DEPARTMENT OF ELECTRONICS AND COMMUNICATION

- DREAM OFFERS
- CORE OFFERS
- IT OFFERS

27
6
57

42 COMPANIES
90 OFFERS

HIGHEST PACKAGE

6.5 LAKHS FROM ZOHO

- MAANASA.S
- SABRISH.S

CORE OFFERS

- RENAULT
- SOLITON
- TATA COMMUNICATIONS

3
1
2

STUDENT CO-CURRICULAR ACTIVITIES

INTERNAL FUNDED PROJECTS

About 38 project proposals were presented by the students of ECE department for internal funding to the project sanctioning committee. The President handed over sanction letters for 26 internal funding projects for students in ECE department on 1st Nov. 2016.

1. N. Bharath Raj (II-Year), S. Brathindara (II-Year), R. Kashyap (II-Year), Dr. S. Radha, Prof., "Study on the feasibility of energy generation from piezoelectric plates fitted on the car tyres"

2. Sai M Anjesh (II-Year), A.S. Shaahank Karrthikeyaa (II-Year), Thevin Arokiaraj (II-Year), T. Ranjeet Kumar (II-Year), Dr. B. S. Sreeja, Asso. Prof., "DroNet"

3. Akilesh Venkatasubramanian (III-Year), N. Elakhya (III-Year), V. Krithika (III-Year), Dr. R. Jayaparvathy, Prof., "Flexible body vitals monitoring patch for athletes"

4. Jayavanta Shakthi Poorna (III-Year), Dr. R. Jayaparvathy, Prof., "Fuel level detector for consumer protection in vehicles"

5. R. Shrivatsan (IV- Year), Nandagopal Srinivasan (IV Year), K. Akash (III-Year), Dr. A. Jawahar, Prof., "Implementation of a mobile wireless sensor network using small differential drive robotic nodes"

6. A. Kishore (II-Year), M. Sindhu (II-Year), L. Barath (II-Year), S. Amirthavarshini (II Year), Dr. Esther Florence, Asso. Prof., "Smart traffic signals"

7. S. Indulakshmi (III-Year), Dr. Esther Florence, Asso. Prof., "Flexible cardiac sensor development"

8. G. Hemanth (II-Year), Ajay Nair (II-Year), K. Harish Kumar (II-Year), V.M. Kumar (II Year), Mr. W. Jino Hans, Asst. Prof., "Smart display system using IOT"

9. S.S. Ramachandran (II-Year), S. Promodram (II-Year), J. Rishi Ganesh (II-Year), Dr. B. S. Sreeja, Asso. Prof., "Smart garbage management"

10. B. Varshini (III-Year), L. Saranya (III-Year), D. Priyadharshini (III-Year), Dr. R. Amutha, Prof., "Medication intake adherence with real time activity recognition on IOT"

11. S. Dyaneshwar (III-Year), G. Jaiyashri (III-Year), K. Monica (III-Year), Dr. K. Muthumeenakshi, Asso. Prof., "A startup for a smart workplace"

12. Gunupati Sumadhura (II-Year), S. Harini (II-Year), N. Mahalakshmi (II-Year)

Dr. K. Muthumeenakshi, Asso. Prof., "Vehicle Speed Controller"

13. A. Rekha (III-Year), Sowmya Bhatraju (III-Year), S. Srivaishnavi (III-Year), Dr. N. Venkateswaran, Prof., "Agricultural soil analysis using image processing"

14. K. Arun (III-Year), J. Allen Fernando (III-Year), J.C. Anandha Padmanaban (III-Year), V. Avinash Venkatachalam (III-Year), Dr. M. Anbu Selvi, Asso. Prof., "Four quadrant speed control of robotic vehicle using ARM Cortex processor"

15. Prithviraj Prabhu (IV-Year), Rishab Venkataraman (IV-Year), Preetha Ganesh (CSE III-Year), Dr. M. Anbu Selvi, Asso. Prof., "Emulation of a quantum com puter using classical analog electronic circuits"

16. A. Divya Sanchana (II-Year), Nishita Maria Govias (II-Year), V. Rakesh (II-Year), S. Rakshana (II-Year), Mr. W. Jino Hans, Asst. Prof., "E-Bin"

17. Aadesh Samdaria (II-Year), K. Raeshak (II-Year), Pramodh Kumar (II-Year), Mr. C. Annadurai, Asst. Prof., "Robotic floor map"

18. Nishanth Vimalesh (III-Year), Dr. M. Gulam Nabi Alsath, Asso. Prof., "Intelli gent and interactive road safety system for young bikers"

19. R. Poorani (III-Year), G. Pradeep (III-Year), Dr. S. Joseph Gladwin, Asso. Prof., Dr. R. Rajavel, Asso. Prof., "Wrap the scrap"

20. C. Akshay Kumar (II-Year), M. Nagulan (II-Year), J. Shaktivelu (II-Year), S. Udaya Ezhil (II-Year), Dr. K.J. Jegadish Kumar, Asso. Prof., "Smart Seat Belts"

21. K.M. Shreemathi(PG), Dr. S. Radha, Prof., "Design and development of PDMS membrane for bio applications"

22. R. Kiruthika (II-Year), Ms. S. Kirubaveni, Asst. Prof., Dr.M.Senthil Pandian, Scientist, "Reduction of screening effect on ZnO nanostructure based nano generator with self powered gas sensor"

23. G. Roshini Singh (II-Year), Ms. S. Kirubaveni, Asst. Prof., Dr.K.Aravinth, Scien tist, "Wideband piezoelectric vibration energy harvester"

24. D. Harshita (II-Year) Dr. S. Sakthivel Murugan, Asso. Prof., "Design and devel opment of insulation tester for array hydrophone"

25. R. Devi (II-Year), Dr. R. Hemalatha, Asso. Prof., "Efficient decision support sys tem for agriculture using ARM processor"

26. B. Dhivya Mullai (II-Year), Mr. S. Ramprabhu, Asst. Prof., "Reduction of vam pire power by smart power socket"

AECE AND TECH CLUB

1. The Association of Electronics & Communication Engineers (AECE) was in augurated by Dr. A. Sada Siva Sarma, Senior Principal Scientist, Central Electronics Engineering Research Institute, Chennai Centre, CSIR Ma dras Complex, Taramani, Chennai on 23rd Aug. 2016

2. Corona 2.0 organized by the faculty and student coordinators of Tech Club on

27th Jul. 2016.

Faculty coordinators: Mr. S. Ramprabhu, Asst. Prof. and Dr. M. Gulam Nabi Alsath, Asso. Prof.

Student coordinators: G.Harshvardhan Raju, Aadithya V, Adarshana R, Ashwin CORONA 2.0 is the second annual Intra-collegiate technical festival hosted by Tech Club. It had 6 events namely, RISC IT (Programming), DISPRO (Project Display), NEUROQUIZ (Sci-tech quiz), SHERLOCK OHMS (Treasure hunt), LINE FOLLOWER (Robotics), SOCKET(Circuit Design).

Over 465 participants participated in the events with over 10 teams partici pating in the one of its kind line follower event. The quiz had over 200 participants which is a great feat. Programming and circuit design had more than 70 teams competing. The event ended with prize distribution with prizes worth 14,500 Rupees being distributed by Dr. S. Radha, Prof. & Head.

3.   The following sessions were handled by the student coordinators of Tech Club.
i)   Adithya. V, Harshvardhan Raju G, Ashwin V, "Basic Robotics" 4 sessions during Jul. and Aug. 2016. The resource persons are Nishanth V, Supreeta V, Srinidhi V and Varsha S of III ECE.
(ii)   Roshan Arvind S, "Introduction to Arduino" on 25th Aug. 2016 for UG and PG students
(iii)   Nandagopal Srinivasan, "Introduction to ECE" on 25th Aug. 2016 for II year UG
(iv)   Harshavardhan Raju, "Machine Learning" on 15th Sep. and 22nd Sep. 2016 for II year UG students.
(v)   Harshavardhan Raju, Prithviraj Prabhu, Aadithya Venkat, Karnik Ram, Nandagopal Srinivasan, "IoT Hackathon" during INVENTE 2k16, 9th & 10th Sep. 2016.

INTERNSHIPS & INPLANT TRAINING

1.   25 students from IV Year, 4 from III Year and 2 from II Year successfully completed internships during July 2016 in various organizations like BHEL, IGCAR, IASc-INSA-NASI scheme at IIT Madras, IIT Gandhi Nagar, Indian In stitute of Science Education & Research, Mohali, Microchip Technology Inc., Perfint Healthcare Pvt. Ltd, SenseHawk Technologies, Rillusion Media Pvt Ltd, Mobodexter Software, Central Mechanical Engineering Research Institute (CMERI)
2.   Ms. C. Joshitha, Full-time research scholar attending the Academia Industry Training (AIT-2016) cycle 3 Switzerland camp at EPFL, Laussane and SUS Zurich. It is a programme sponsored by DST, SINE (IIT Bombay), EPFL (Lausanne), Venture lab (Switzerland) for top 10 Indian contestants, 10 Brazil ian contestants and 20 Swiss contestants.

SYMPOSIUM & WORKSHOPS

1. Ms. C. Joshitha, Full-time research scholar attended the "National Symposium on Nano Science and Technology" (NSNST-2016) at CeNSE (Centre for Nano Science and Engineering), IISc, Bangalore on 29th and 30th Jun. 2016.
2. Mr. V. Lingasamy, Research Scholar attended "Seminar and Poster Session on Recent Advances in Antenna Technologies & Applications" held at Karunya University, Coimbatore on 8th Jul. 2016.
3. Ms. S. Swathi, Research Scholar attended the workshop on "Hands-On train ing on NS2" at Kongu Engineering College, Perundurai, Erode from 4th to 6th Aug. 2016.
4. Ms. S. Swathi and Ms. Annalakshmi, Research Scholars attended the workshop on "Art of Writing Paper and Proposal" at KCG College of Technology, Kara pakkam, Chennai on 20th Aug. 2016.
5. Ms. R. Jansi and Ms. K. Ashwini attended workshop on Machine learning in intelligent image processing at SSN college of Engineering held by the de partment of Computer Science from Sep 30 to Oct 1, 2016. .
6. Ms. C. Joshitha, Research Scholar attended the Academia Industry Training (AIT-2016) cycle 3 at Bangalore sponsored by DST, SINE (IIT Bombay), EPFL (Lausanne), Venture lab (Switzerland) for top 10 Indian contestants and 10 Swiss contestants from 2nd to 7th Oct. 2016.

STUDENT EXTRACURRICULAR ACTIVITIES

SPORTS ACHIEVEMENTS

1. E.Vignesh of Final year ECE participated in the Tamilnadu Cricket Association (TNCA) first division cricket league matches organized by TNCA between 4th July 2016 and 29th July 2016
2. P.Divya of II year ECE received the special award from the Anna University annual award function on 7th Sep. 2016 for representing Anna University in University level Chess Tournaments. She was also the runner of Anna University inter Zone Chess Tournament organized by TRP Engineering College, Trichy held on 30th Sep. 2016.
3. N.Hemapriya of final year ECE represented the Anna university Chess team in the All India inter university Chess competition organized by Vel Tech University, Chennai during 5th Oct. 2016 to 11th Oct. 2016.

4.   L.Bharath of ECE II year represented Tamilnadu state in the Under-19 National Chess championship held at Rajamundry between 7th Oct. 2016 and 16th Oct. 2016.

CULTURAL & OTHERS

1.   Nine students from ECE department participated in the Entrepreneurship Awareness Camp from 19th   21st Sep. 2016

2.   Nikhilesh.N, Rakesh V. Sarjana O.S, S. Rakshana, Vishal I B of ECE II year attended the 3rd edition of SSN MUN, an International level Model United Nations Conference from 16th to 18th Sep. 2016.

3.   Reshma Immaculate R of ECE II year attended the MUN, an International level Model United Nations Conference at SRM Ramapuram 19th and 20th Aug. 2016

4.   82 students of ECE II year attended the Workshop on "Wireless Sensor Nodes" conducted as part of CORONA 2.0 an Intra-College Technical Fest

5.   Kishore A of ECE II Year attended the Independence Day celebrations lecture on "Edhu Sudhandhiram" by Mr. T. Sairam, Lead Engineer, Radisys, Bangalore on Friday, the 12th Aug. 2016 at SSN

6.   Kishore A of ECE II Year attended the lecture "Maatram Aavom- Be the change" by write Thiru Samas on 17th Aug. 2016 at SSN

7.   M Sindhu of ECE II year attended the entrepreneur awareness camp held on 19th and 21st Sep. 2016

8.   R Ganapathi of ECE II year was part of a show at Chetinaad Harishree Vidyalaya, conducted by CreaSakthi and Lights Out Please the dramatics club of SSN.

SERVICE TO SOCIETY

1.   NSS Unit and YRC Unit of our college organized Blood donation camp on 13th Sep. 2016 in association with Madras Voluntary Blood Bureau, Chennai. 230 Units of Blood were donated by the students and faculty of our college to Govt. General Hospital, Chennai. Dr. S. Joseph Gladwin, Asso. Prof. and Ms. P. Kaythry, Asst. Prof. arranged for the camp.

2.   A bunch of NSS Volunteers were involved in creating a sustainable environment of true wellness. They are engaged in organic farming practices in our college campus for an area of 20 × 30 near college nursery. Volunteers aimed to regenerate the soil and protect the biodiversity in a small way under the guidance of NSS Programme Officer.

3.   NSS unit in association with "Yuva sakthu" an NGO organized Independence Day Lecture on " Ethu Sudhandiram" to motivate the students of our college on 12th Aug. 2016.

4.   As part of Daan Ustaav, 170 NSS Volunteers of our college participated in the "Beach Clean up Drive" organized by Bhumi, NGO on 2nd Oct. 2016.
 Dr. S. Joseph Gladwin and 40 YRC volunteers visited 'Arul Illam', a home for orphan children and underprivileged, on 2nd Oct. 2016.

REFLECTIONS
ALUMNI CORNER

DONNING BUSINESS HATS

**APARNAA
CLASS OF 2016**

**SHRUTI SUNDER
CLASS OF 2016**

Four fruitful years of slogging, tests, semesters, internships and papers, and the list is endless. An engineering student seamlessly manages to relentlessly, effectively juggle multiple roles to carve a niche for her in the industry. As responsibilities loom large ahead of them in life, there are mixed feelings and emotions about decisions they ought to make after their graduation, whether it is a higher education or settling in a well-paid core job. While the most common option among students in pursuing a higher education abroad occupies the limelight, there are a few who dared to confront the conception to look beyond the scope of technical domains.We have here APARNAA and SRUTHI SUNDER, who have secured an admit into one of the most prestigious B-schools in India.

APARNAA, INDIAN SCHOOL OF BUSINESS, CAT   98.6%, GMAT-720, YOUNG LEADERS PROGRAM (YLP), INDIAN SCHOOL OF BUSINESS (ISB)
As a bright, young student of the department of ECE, she was always interested in strategizing activities as a joint secretary of the tech club.She was a student who was much more interested in executing a plan, than the plan itself.Having been admitted into a one year post-graduate programme in management through the Young Leaders program of the ISB, Aparnaa strongly believes that engineering drove her to this field.

"During my sixth semester, I applied for this unique program by the ISB, that entitles all pre-final year students secure admits even before the completion of their engineering. Though I was extremely good at engineering, it is the innocation, critical thinking, lateral analysis and case studies of problems that I found similar and befitting enough to mould me for a career in management", she says.With two technical internships and an offer from Latent View in the field of business analytics, Aparnaa is confident enough to garner enough experience for a period of two years,that is mandatory for her entry into the prestigious INDIAN SCHOOL OF BUSINESS!We whole-heartedly wish Aparnaa all success in her future endeavours.

SRUTHI S, XAT 99.188%, CAT-97.2%, POST GRADUATE PROGRAM IN MANAGEMENT(PGP), INDIAN INSTITUTE OF MANAGEMENT(IIM), BANGALORE
Another aspiring student from the department of ECE is Sruthi who has secured admission for a business management program in XLRI Xavier School of Management. As a young girl, Sruthi was always interested in the business aspect of things, how every single detail matters when it comes to the working of an organization. When asked about what enhanced her interest in management, she says, "I took up an internship in management during my semester holidays. The exposure I received there was completely different from what I gained in the classroom. This was when I got to know how things worked in this field." As a brilliant engineering student, Sruthi also feels that engineering and management are not two entirely different fields. "Technology is involved everywhere and an engineering background is definitely useful. We, as engineers, know how to break a problem into parts, and taking one step at a time, can produce satisfying solutions. Accomplishing such tasks require a skilled-analysis approach that engineers are well-equipped with to prepare us for a career in management", Sruthi says. When questioned on the preparation that is involved in cracking entrance exams like XAT, she says, "The belief that CAT or XAT is difficult is a hyped notion. Getting acclimatized to examination patterns and accordingly preparing are the key strategies to crack the tests. They are all about time management and how well we develop our thinking before running the last lap." She further adds that the interview scheduled after the written test, is the most challenging part that assess the diverse facets of your personality in deciding your eligibility for a management degree. "An MBA, like any other masters, is just the start and sets the base on which you can build your career. The rest lies in what you do with the education you receive in your professional life. And a B-school rigorously prepares you for exactly that." she signs off. Sruthi, has definitely set an example for juniors not just in choosing a path that is competitive and challenging, but most importantly, in achieving it. Thanks Sruthi.

SUCCESS IS A MEASURE OF HAPPINESS
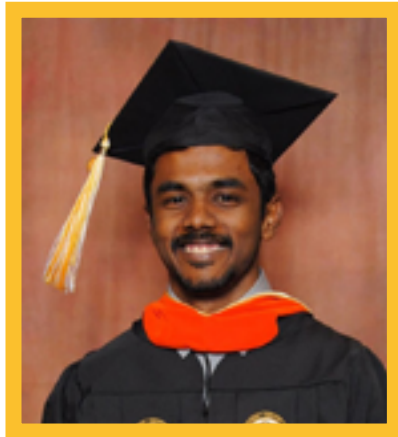
SHANMUGAM RAMASAMY
CLASS OF 2014

Life is a journey, not a destination. This is one of the most important lessons that I have learnt so far. Let me begin by introducing myself. I am Shanmugam Ramasamy, a Big Data Analyst at Yahoo. I graduated from SSN in 2014. Immediately after undergrad, I did my masters in Electrical and Computer engineering at Georgia Tech after which I joined Yahoo. It has definitely been an exciting journey, from the days I was sitting in the last benches at SSN to where I am right now. I would like to reminisce about my voyage and share some of the wisdom and knowledge that I gathered during this journey.

My life started off with the routine regime, the familiar harp of how my score in 10th grades would grant me unremitting happiness. Little did I know that it was just the beginning of the expedition. After 10th, the puppet show continued seamlessly to my 12th grade, undergrad, GRE examinations and job placements. At each juncture, I was greeted with the customary monotony of how paramount it was to work diligently in order to secure my future. It was during this period of constant strife that I contemplated on life and it finally dawned on me that the quest to happiness is never ending.

However, I understood something significant along this journey. There is nothing called as eternal happiness. No success, irrespective of how big it is, will make you happy forever. It is the small memories that you made with friends and family along this journey that are etched in your mind. Few years down the line when you sit and travel down your memory lane, it's not your academic prowess, but the fun and frolic you had which nonchalantly brings a smile on your face. So never miss out on such delicate intricacies of life for they are the ones which give you the most happiness.

Happiness and success are indeed strongly correlated. However, the way you perceive this correlation makes a tremendous difference in how you lead your life. Looking around, I see so many people defining happiness as a measure of success. I strongly affirm that they have misunderstood the basic tenets of life. Rather, your success should be a measure of happiness. Doesn't matter what you do, the happier you are the more successful you should consider yourself to be. Don't over think about your future or what friends around you are doing. Nothing is certain in this rapidly changing world. Present is all that you got. Make the best use of it. Study what you like, follow you passion, and most importantly, be happy.

All said and done, there is absolutely no substitute to hard work. Our whole life is a continuous metamorphosis right from the time we are born to the places we might venture in the future. Nothing in life is guaranteed. So working hard might not immediately get you to the exact destination you desire to be at but you would definitely reap its benefits later on. There would be times in life when the tides would turn against you without any warning. Even in one's darkest hours, instead of being bogged down by setbacks, one should pick himself up for more challenging endeavours. The satisfaction that you tried your best will goad you to think positive and come back stronger. Most of life's arduous battles are won with the mind and hence a positive attitude is one of the key attributes to success and happiness. In a nutshell, there are difficulties for everyone. Whether you win it over or let it win over you is solely determined by your attitude.

Life as such is a stunning yet meandering odyssey full of twists and turns and I was one among the millions, totally confounded on which path to choose – be it career, college, job, etc. Having crossed that phase, I can definitely tell you with conviction that there is no right or wrong decision with respect to any of them. What is more imperative is how you follow up your decision with a comprehensive plan of action. This is what critically determines your path to success and happiness. So, whatever you decide, completely believe in yourself and put in your full effort, and hope for the best. Even if it doesn't work out right away, I am sure it will sometime in the future. So be positive and always believe that things happen for a reason.

On a concluding note, each one's life is unique and full of opportunities. So never regret the past. Be happy and live in the present. Always remember, happiness defines how successful you are and not vice versa.

ALUMNI UPDATES

The Department of ECE is proud to share that the following students of 2012   2016 batch joined reputed Universities in India and abroad for higher studies. The Depart-ment congratulates and wish them success in all their future endeavors.

S.NO.	NAME OF STUDENT	UNIVERSITY
1	Adithya Bharadwaj A	University of California, SD
2	Aishwarya S	Rutgers,New Brunswick
3	Anjana Krishan	Dartmouth college, Duke University
4	Aparnaa Ramanathan	ISB Hyderabad (Deferred admit)
5	Arun Kumar C	North Carolina State University
6	Balasubramanian R	North Carolina State University
7	Hansini V	TUM
8	Karthikeyan K	Hongkong University of Science and Technology
9	Praveen S	University of Florida
10	Prithvi Shankar S	Carnegie Mellon University
11	Ramachandran N	University of Florida
12	Rishwanth S	North Eastern University
13	Sindhu Madhuri M	Suny Buffalo
14	Srihari S	University of California, SD
15	Srinath N	University of California, SD
16	Srivasanth B	Arizona State University
17	Srividya N	Georgia Institute of Technology
18	Sruthi S	Indian Institute of Management, Bangalore
19	Varsha S	Stanford University
20	Varshini T N	Purdue university
21	Varushini R	Arizona State University
22	Veera C	Texas AM University
23	Yasasvini P	University of Virginia
24	Vaishnavi K	Technische Universität Darmstadt, Germany

FORTHCOMING EVENT

1.   IEEE International Conference on Wireless Communications, Signal Processing and Networking – WiSPNET 2016 during Mar. 2017.