PROPAGATIONS

ECE NEWSLETTER (JUNE 2017 - DEC 2017)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VELAMMAL INSTITUTE OF TECHNOLOGY, PONNERI.

VISION OF DEPARTMENT

To achieve academic excellence in the field of Electronics and Communication Engineering and to produce meritorious engineers with human values by imparting high quality technical education.

MISSION OF DEPARTMENT

- To create efficient Electronics and Communication Engineers to meet the current and future demands of industry and society with ethical values.
- To instil the quality of leadership and entrepreneurship in students .
- To elevate the spirit of innovation and creativity among students towards research and development.

INSIDE...

CHIEF EDITOR
DR .B. SRIDEVI
(HOD-ECE)

EDITOR
MR.B.V.SANTHOSH KRISHNA
(AP-ECE)

STUDENT CO-ORDINATORS
MR.M.SRIBALAJI
& MS.N.YUGA

A GOAL SHOULD SCARE YOU A LITTLE & EXCITE YOU A LOT!

MESSAGE FROM HOD

Our department has been strengthened by its reputed faculty members and students who put in their efforts to produce tangible outcomes in the form of publications, patents and funded projects. Our students are given oppurtunities for getting placed in highly reputed core companies and public sector units and year by year they are proving it. Our alumni hold senior positions in industries. I subscribe to the belief that "one must find meaning in one's daily work". The best work happens when you know that it is not just a work, but something that will improve other people's lives. I thank all the students and staff members for their continuous effort and support for bringing this edition "Propagations May 2019".

Best Wishes to all our students for exams

-DR.B.SRIDEVI
(HOD - ECE)

SECTION - A

AROUND THE DEPARTMENT

HIGHER EDUCATION CELL ACTIVITY

Motivation talk on "Competitive Exams-UPSC and TNPSC" was conducted by ECE department on 23rd June 2017. **Ms.C.SELVAPRIYA**, Alumni, VCET explained the process and ways to crack competitive exams for ECE students.

ENTERPRENEUR DEVELOPMENT CELL ACTIVITY

A guest lecture on "Data center overview and its features" was conducted by ECE department on 30th June 2017. **Mr. S. MANIVANNAN,** Joint Director, Software Technology Parks of India(STPI), Chennai delivered lecture on Data center and its features for II and III year ECE student.

MOU(S) SIGNED

Sl No	Name of the Organization	Nature of Company	Address	Signed on	Logo
1	Amogaa Products Private Ltd	M2M, IoT, Mobility, Big data, Cloud and Analytic	195, 2nd floor, Vakilnew Street, Simmakkal, Madurai Main, Madurai,TamilNadu.	November 2017	amogaa
2	Avian Aerospace	Unmanned Aerial Vehicles Research & Development	47/1, 3rd Floor, Ambattur Railway Station Road,, varadharajapuram, Ambattur, Chennai, Tamil Nadu 600053	December 2017	AVIAN AEROSPACE

PROFESSIONAL SOCIETY ACTIVITIES

Sl. No.	Title of the Program	Name of the Program	Chief Guest	Organized By	Date
1	IETE Inaguration & Quiz	Technical Quiz	R.P.B Sundaram Retd RGM,BEL & Executive Member IETE	Mr.K.Ragupathi	28.12.2017
2	ISTE	Workshop on INTERNET OF THINGS (IOT)	Mr.Sathyanath Prem Kumar, Amogaa Products Pvt Ltd	Mr.G.Shanmugaraj Mr.G.Sethuram rao	21-12.2017 & 22.12.2017

VALUE ADDED PROGAMME

Sl. No.	Title of the Program	Chief Guest	Date	Target Audience
1	Python Programming	Dr. Benjamin Joseph & Mr. K. Ragupathy	19.06.2017 to 20.06.2017	III Year ECE A &B Sec (2015-2019)
2	Raspberry pi	Mr.R.Ganapathy & Mr.Michael, EPR labs, Chennai.	21.06.2017 to 22.06.2017	II Year ECE A &B Sec (2016-2020)

INDUSTRIAL VISIT

Sl No	Name of the Organization	Year	Date of Visit	Staff Accompanied
1	Indian Space Research Organisation	II / III (A&B)	27/09/2017	Mr.K.Ragupathi, Mr.Jijingodwin, Mr.T.Chandrasekar, M.Manju
2	Software Technology Park of India	III / V (A&B)	01/07/2017	Mr.K.Ragupathi, Ms.T.Kamalam Mr.Dhayaniythi, Mrs.S.Ishwarya

GUEST LECTURE DETAILS

Sl No	Subject	Name of the Speaker in Guest Lecture & Details of Speaker	Organized By	Date
1	Trends in IOT	Mr.Sathyanath Prem kumar From " Amogaa product" Chennai	Dr.B.Sridevi HOD-ECE	1.9.2017
2	Opportunities in VLSI design	Mr.Dinesh Babu,VLSI Architect in WIPRO-Bangalore.	Ms.M.Manju Assistant Prof-ECE	28.7.2017
3	Data Structure in C,C++	G.Prethija, AP Velammal Engg College , Surapet	Mr. Deivendiran Assoc Prof-IT	05.9.2017

FACULTY PARTICIPATION IN FDP / WORKSHOP

Sl. No.	Name of Staff	Attended FDTP / Workshop	Name of the institution	Duration
1	Dr.B.Sridevi	Industry academia interaction meet	Anna University, NIOT, IIT	13.10.17 -16.10.17
2	Janish Blessy Daniel	IEEE course on Antenna	SSN Engineering college	27.11.17-2.12.17
3	S.Manju	Deep learning neural network for Text& Image Analysis	SSN Engineering college	13.12.17 -25.12.17
4	B.V.Santhosh Krishna	Deep learning neural network for text& image analysis	SSN Engineering college	13.12.17 -25.12.17
5	K. Raghupathi	FDP on training tomorrow teachers	NIT TRICHY	20.11.17-24.11.17
6	T.Kamalam	Optical network work shop	SRM Institute of Technology	1.12.17-2.12.17
7	M.Manju	Anna university sponsored FDTP on basic electrical & electronics engg	Velammal institute of Technology	29.11.17 -5.12.17
8	S Sri Iswarya Lakshmi	Anna university sponsored FDTP on basic electrical & electronics engg	Velammal institute of Technology	29.11.17 -5.12.17
9	R.Muthurasan	Anna university sponsored FDTP on basic electrical & electronics engg	Velammal institute of Technology	29.11.17-5.12.17
10	J.Jijin Godwin	Hands on training on RF circuits and antenna Design using ADS CST & HFSS	SA Engineering College	27.11.17-29.11.17
11	S.Karthikeyan	Hands on training on RF circuits and antenna Design using ADS CST & HFSS	SA Engineering College	27.11.17-29.11.17

STAFF JOURNAL PUBLICATIONS

Sl. No.	Name of the Faculty	Title of the Paper	Name of the Journal	Month/ Year of Publication	ISBN / ISSN Number	Volume/ Issue/Page number
1	G. Shanmugaraj	A distributed framework for surveillance mission with aerial robots to detect intruder	Fronteiras	Aug-17	2238-8869	Special Issue/Vol. 6/1-8
2	S.Ilaiyaraja	Gesture recognition of Parkinson affected people by image processing and neural network	Fronteiras	Aug-17	2238-8869	Special Issue/Vol. 6/9-14
3	G.Sethuram rao	Hands free operation on home appliances using brain computer interface	Fronteiras	Aug-17	2238-8869	Special Issue/Vol. 6/15-21
4	B.V.Santhosh Krishna	Innovative wearable device for museum	Fronteiras	Aug-17	2238-8869	Special Issue/ Vol. 6/182-188

BOOK PUBLICATIONS

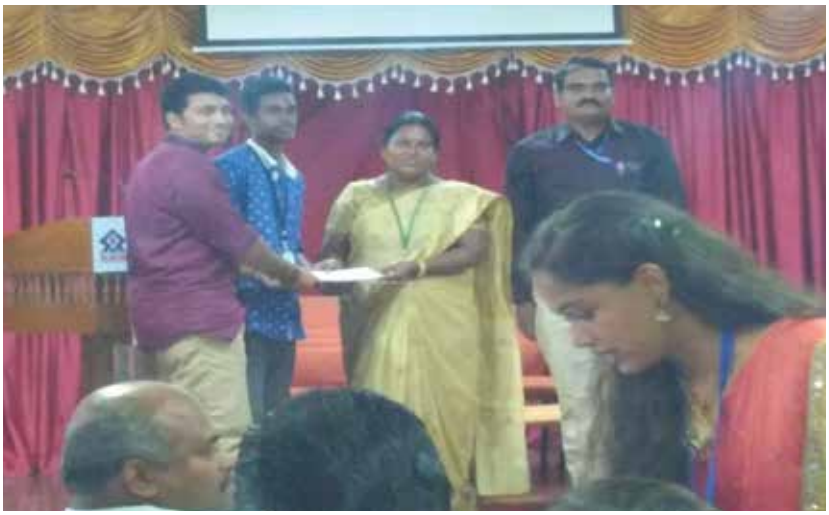
Sl. No.	Author	Title	Year	Publisher	ISBN
1	S.Ilaiyaraja	Circuit Analysis	2017	Technical	9789333217378
2	M.Manju & D.Jeyamani Latha	Antenna Wave propagation	2017	Technical	9789333206860
3	L. Balaji	Transmission Lines and Waveguides	2017	Sahara Publications	9789386636065
4	L. Balaji	Microcontroller Based System Design	2017	Sahara Publications	9789386636072

STUDENT'S JOURNAL PUBLICATIONS

Sl. No.	Name of the Student's	Journal Name	Title of The Paper	Volume /Issue No	Date
1	Tharun Kumar. P, Dakshan Kumar. M , Reshanth.S, Sidhu. P	Frontiers of Current trends in engineering and technology	Modern E-Aid to dementia patients	45-46, Special Issue	Nov-16
2	Banu B, Merlin S, Anu D, Aiswarya S	International Journal of multi-disciplinary research	Intelligent wheelchair with patient monitoring system	Vol. 3, No. 2	Mar-Apr 2017
3	Sinthiyasruthi G, Nila S, Thilagavathi T	International journal for research in applied science & engineering technology	A Semi-autonous security system for coal mine using wireless control based on real time operating system [rto]	1-12, Vol. 5, Issue IV	Apr-17
4	Keerthiraaj S, Krishna Sandeep K V	Frontieras	Energy efficient object detection based on wireless multimedia sensor networks	222 - 228, Vol. 6, Special Issue	Aug-17
5	Balaji J, Mohamed Asfak S, Mohanraj D, Sangeetham Nethra	Frontieras	A distributed framework for surveillance mission with aerial robots to detect intruder	1 - 8, Vol. 6, Special Issue	Aug-17
6	Susithra K, Kanmani G R, Niveditha S	Frontieras	smart guide for museum	182-188, Vol. 6, Special Issue	Aug-17
7	Padmavathi N, Sivashankari V, Rekha R	Frontieras	hands-free operation on home appliances using BCI	15-21, Vol. 6, Special Issue	Aug-17
8	Divya P, Sangavi K, Surya M	Frontieras	Optical based industrial robot control	615 - 618, Vol. 6, Special Issue	Aug-17

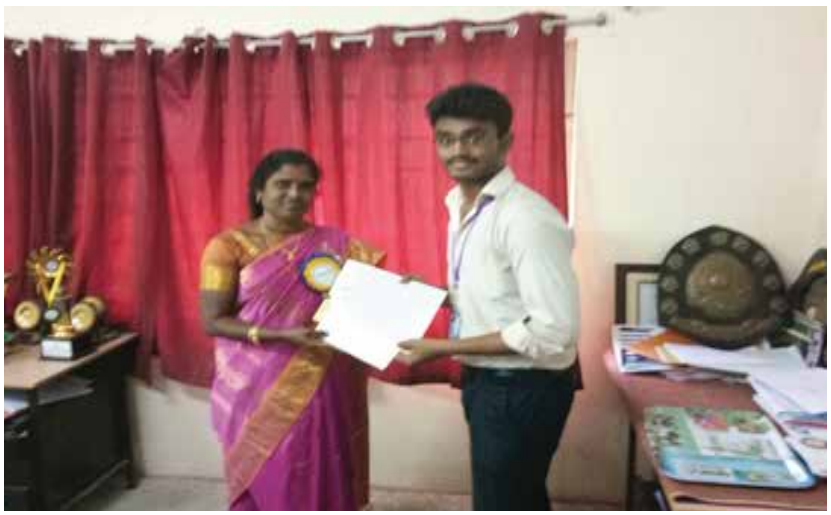
9	Abishek Hariharan, Jijendiran, Vignajeth	Frontieras	Simple recognition of alphanumeric characters by image processing technique for parkinson affected people	9 - 14, Vol. 6, Special Issue	Aug-17
10	Bharath Kumar J, Mohamed Rashid S, Sankara Narayanan K	Frontieras	Identification of pothole using digital image processing	902 - 909, Vol. 6, Special Issue	Aug-17
11	Mahesh S, Vignesh D, Prasanna Balaji D	International Journal of Electrical, Electronics and Data Communication	Sign language recognition system to aid deaf-dumb people using controulet transform	55 - 58, Vol. 5, No. 7	Jul-17

STUDENTS ACHIEVEMENTS

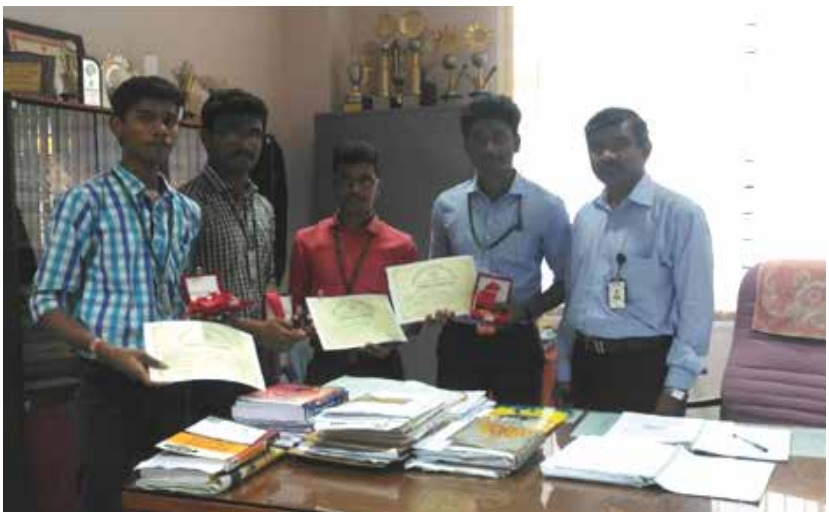


M.AGILESH KUMAR, V. AKASH won the first place in TARAS'17 in Valliammai engineering college for paper presentation on 09.09.2017.

R.AKASH, won the first place in Prathyusha Engineering College for Paper Presentation on 16.09.2017.



R.AKASH, T.VANJINATHA PRABU, P.DHINESH, K.VIGNESH won the first place in SKR engineering college for Project Expo on 07.10.2017.



AKASH R, VANJINATHA PRABU T, VIGNESH K, DHINESH P Won The Second Place in IETE -Loyola College of Engineering for Project Display on 28.11.2017

P.LAVANYA, R.RELIN BESSY won first place in SSN college of engineering for poster presentation on 08.09.2017

LIST OF STUDENTS PARTICIPATED INTER COLLEGE EVENTS

Sl. No.	Name of Students	Batch	Event Name/ Organization	Event Type	Date	Winner/ Runner/ Participated
1	K.Dilip Krishna	2015-2019	Nakshatra'17/S.A. engineering college	Project Display	12.08.17	Winner
2	V.Priyadharshini, B.Sneha, B.Subashini, P.Priyanga, P.Preethi	2015-2019	Meenakshmi Sundararajan Engineering College / Pranav2k17	Project Presentation	30.08.17	Participated
3	Sushma, D.Shri Harini, R.Priyanka	2015-2019	Meenakshmi Sundararajan Engineering College / Pranav2k17	Brain Wreck, CODE-A-THON	31.08.17	Participated
4	V.Sudharsan	2015-2019	Adhiyamaan College of Engg / Crypto 2k17	Code Check, Paper Presentation, Technical Quiz	07.09.17 & 08.09.17	Participated
5	P.Dinesh, R.Surya	2015-2019	Bannari Amman Institute of Technology / Futura'17	Project Design Contest	07.09.17 - 09.09.17	Participated
6	D.Aravindan, G.Balaji	2015-2019	SSN College of Engg / Invente 2.0	Paper Presentation	08.09.17 & 09.09.17	Participated
7	P.Lavanya, R.Relin Bessy	2015-2019	SSN College of Engg	Poster Presentation	08.09.17	I
8	S.Sushmitha, S.Sreeja, C.Deepika H.Raghav, S.Karthikeyan, U.Jayakumar	2015-2019	SSN College of Engg / Invente 2.0	Project Display	08.09.17 & 09.09.17	Participated
9	V.Akash, AgileshKumar.M	2015-2019	Valliammai Engineering College	Project Presentation	09.09.17	I
10	V.Sudharsan, B.Vignesh	2015-2019	Prathyusha Engineering College / Aavishikar'17	Paper Presentation	16.09.17	Participated
11	V.Sudharsan, D.Mukesh, G.Naveeneedhan	2015-2019	Prathyusha Engineering College/Aavishikar'17	Extronics	16.09.17	I
12	M.Santhosh, V.Praveen, N.Kuralarasu	2015-2019	Prathyusha Engineering College	Extronics	16.09.17	II
13	R.Akash	2015-2019	Aavishikar"17/Prathyusha Engineering College	Paper Presentation	16.09.17	I

14	V.Jayakumar	2015-2019	Versio'17 / SRM University	Project Expo	22.09.17	Participated
15	S.S.Karthikeyan, H.Raghav	2015-2019	Versio'17 / SRM University	Project expo	22.09.17	Participated
16	V.Praveena, N.Aravithini,	2015-2019	Technofes / DMI College of Engineering	Eureka"17 Eclesia	23.09.17	Participated
17	Agilesh Kumar.M	2015-2019	Jerusalem College of Engineering	Paper Presentation	23.09.17	Participated
18	Agilesh Kumar.M.	2015-2019	Jerusalem College of Engineering	Mini Project	23.09.17	III
19	Akash R, Vanjinatha Prabu T, Vignesh K, Dhinesh P	2015-2019	SKR Engineering College	Project Display	07.10.17	I
20	T.Dinesh, R.Surya, P.S.Arunkumar	2015-2019	Thiruvallur District Skill Summit 2017	Project Display	11.10.17	II
21	Akash R, Vanjinatha Prabu T, Vignesh K, Dhinesh P	2015-2019	IETE -Loyola College of Engineering	Project Display	28.11.17	II

INTERNSHIP / IN-PLANT TRAINING DETAILS

Year / Sem / Sec: II/III/A&B ODD SEM 2017-18 Batch: 2016-2020

Sl. No.	Name of the Students	Name of the Company	Internship/ In-plant training	Period (From: To)	Number of Days
1	ADHITHYA	HCL	INPLANT	08.06.17-09.06.17	2 Days
2	MONISHA	HCL	INPLANT	08.06.17-09.06.17	2 Days
3	JEYAPRAKASHNI	HCL	INPLANT	08.06.17-09.06.17	2 Days
4	ABITHA	HCL	INPLANT	08.06.17-09.06.17	2 Days
5	VERONICA PRASAD	HCL	INPLANT	08.06.17-09.06.17	2 Days
6	PADMAJA	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
7	SUSHMITHA	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
8	SWETHA P	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
9	YAMINI	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
10	PAVITHRA D	HCL	INPLANT	08.06.17-09.06.17	2 Days

11	V.SUCHITHRA	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
12	BINITA PAUL P	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
13	S.GAYATHRI	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
14	M.POOJA	KAASHIV INFOTECH	INPLANT	27.11.17-31.12.17	5 Days
15	DIVYANI	KAASHIV INFOTECH	INPLANT	27.11.17-31.12.17	5 Days
16	ARIVU SUDER	KAASHIV INFOTECH	INPLANT	27.11.17-31.12.17	5 Days
17	SANDHIYA.K	KAASHIV INFOTECH	INPLANT	27.11.17-31.12.17	5 Days
18	HARSHITHA	KAASHIV INFOTECH	INPLANT	27.11.17-31.12.17	5 Days
19	N.RINTU	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
20	AMULYA NISSY	HCL	INPLANT	08.06.17-09.06.17	2 Days
21	ABHINAYA	HCL	INPLANT	08.06.17-09.06.17	2 Days
22	A.ALINE GRATIA	BSNL	INPLANT	27.11.2.17-01..17	6 Days
23	A.ALINEGRATIA	HP ENTERPRISE	INPLANT	08.06.17-09.06.17	2 Days
24	THILOTHAMMA.S	BSNL	INPLANT	27.11.2.17-01..17	6 Days
25	T.H.MONIKA	BSNL	INPLANT	27.11.2.17-01..17	6 Days
26	S.KEERTHI	BSNL	INPLANT	27.11.2.17-01..17	6 Days
27	M.SANDHYA	BSNL	INPLANT	27.11.2.17-01..17	6 Days
28	N.SHAGAVI	BSNL	INPLANT	27.11.2.17-01..17	6 Days
29	S.SRI SAHITHYA	BSNL	INPLANT	27.11.2.17-01..17	6 Days
30	N.NEHA FATHIMA	PANTECH SOLUTIONS	INPLANT	29.11.17-3.12.17	8 Days
31	B.KIRUTHIKA	PANTECH SOLUTIONS	INPLANT	29.11.17-3.12.17	8 Days
32	K.PAVITHRA	PANTECH SOLUTIONS	INPLANT	29.11.17-3.12.17	8 Days
33	K.KEERTHANA	PANTECH SOLUTIONS	INPLANT	29.11.17-3.12.17	8 Days
34	S.THARANEE SHREE	TRANSENERGY LIMITED	INPLANT	04.12.17-05.12.17	1 Day
35	B.SREENIDHI	TRANSENERGY LIMITED	INPLANT	04.12.17-05.12.17	1 Day

36	A.ASHWINI	BSNL	INPLANT	27.11.2.17-01..17	6 Days
37	A.ARIFFA	BSNL	INPLANT	27.11.2.17-01..17	6 Days
38	R.P.SRINIDHI	BSNL	INPLANT	27.11.2.17-01..17	6 Days
39	R.POORNIMA	CODE BINDTECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
40	S.SRINIDHI	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
41	T.ABINAYA	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
42	K.AKASH	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
43	P.ABISHEK	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
44	M.SRIKANTH	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
45	R.NATARAJAN	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
46	M.SRIBALAJI	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
47	N.YUGA	HP ENTERPRISE	INPLANT	08.06.17-09.06.17	2 Days
48	P.AKSHAYA	HP ENTERPRISE	INPLANT	08.06.17-09.06.17	2 Days
49	B.JANANI	HP ENTERPRISE	INPLANT	08.06.17-09.06.17	2 Days
50	M.NILAVARASI	HP ENTERPRISE	INPLANT	08.06.17-09.06.17	2 Days
51	P.SANTHOSH	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
52	M.PAVITHRA	KAASHIV INFOTECH	INPLANT	27.11.17-31.12.17	5 Days
53	HARSHITHA	KAASHIV INFOTECH	INPLANT	27.11.17-31.12.17	5 Days
54	YAMINI	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
55	SWETHA P	CODE BIND TECHNOLOGIES	INPLANT	30.11.17-04.12.17	5 Days
56	ADHITHYA.T	HCL	INPLANT	08.06.17-09.06.17	2 Days
57	PAVITHRA D	HCL	INPLANT	08.06.17-09.06.17	2 Days
58	KARTHIKA.D	HCL	INPLANT	08.06.17-09.06.17	2 Days
59	NIVETHA	HCL	INPLANT	08.06.17-09.06.17	2 Days
60	JERIN GOLDBELL	HCL	INPLANT	08.06.17-09.06.17	2 Days

RECENT TECHNOLOGIES

ARTICLE ON IMPROVING RELIABILITY WITH CRYOGENICS

Cryogenics is the study of the production of extremely cold temperatures and is a field of science that looks at what happens when materials, whether metals or gases, are exposed to very low temperatures.

There are a wide number of potential and actual applications that use cryogenics. For example, as well as mission-critical cooling systems for space and science projects, such as the Large Hadron Collider or the Planck Space Observatory, cryogenics is being used for cold storage and transportation in the food industry; in the prevention of overheating in underground cables and wind turbine technology as well as in aerospace, telecommunications and electronics.it can improve the performance of the electronics in the form of lower noise, higher speed and increased efficiency.

With cryogenic treatment of electronics, gaps within the structure of their metallic components can be reduced, so lowering the artifacts in the electrical current and producing a truer signal and providing better performance and endurance.

Among other attributes associated with cryogenics are that it has been found to extend the life of circuit boards in extreme conditions and that it reduces the residual stress found between the layers of thin film magnetic memory.

It has also been found to increase the contact life of relays, circuit breakers and switches.Other benefits include: improved thermal and electrical conductivity, lower operating power, reduction of parasitic losses, diminished chemical and metallurgical degradation, and improved overall reliability.

The range of temperature associated with cryogenics does tend to vary but is usually associated with temperatures that are below -190 degrees Fahrenheit or 123 degrees Celsius.

There are a number of ways to generate these kinds of temperatures, including the use of specialised deep freezers or by employing liquefied gases like nitrogen, and at those kinds of temperatures, the impact on materials can be profound.

Contributed by,

RAGHEL.N.J
(ECE-A) III yr

ARTICLE ON SPINTRONICS

Electronics is based on measuring the tiny electrical charge of electrons passing through electronic circuits. An alternative approach under development is spintronics, which instead relies not on electrons' charge, but on another of their fundamental quantum-mechanical properties

Spin can be visualised as the Earth turning on its own axis while rotating around the sun. In the same way, an electron spins on its own axis while rotating around an atom's nucleus. Spin is either "up" or "down". In the same way traditional electronics uses charge to represent information as zeros and ones, the two spin states can be used to represent the same binary data in spintronics.Spin can be measured because it generates tiny magnetic fields. Ferrous metals such as iron become magnetic, for example, when enough particles have their spin set in the same direction, generating a magnetic field of the same polarity as the spin.

Spintronics has several advantages over conventional electronics. Electronics require specialised semiconductor materials in order to control the flow of charge through the transistors. But spin can be measured very simply in common metals such as copper or aluminium. Less energy is needed to change spin than to generate a current to maintain electron charges in a device, so spintronics devices use less power.

Spin states can be set quickly, which makes transferring data quicker. And because electron spin is not energy-dependent, spin is non-volatile – information sent using spin remains fixed even after loss of power.

Article on
UPGRADING HARD DISKS USING SPIN

A hard disk drive stores data as ones and zeros encoded magnetically on rotating disk platters within the drive. The magnetic field is generated when electrons flow through wire coils mounted in the drive write heads which move across the face of the platters, changing the alignment of the magneto-sensitive particles on the platter surface. Reversing the electron flow reverses the field; the two directions represent one and zero. To read from the disk the process works in reverse.

A GMR drive head consists of two ferromagnetic layers, one with a fixed magnetic field direction and the other free to align with the magnetic field encoded on the disk, with a non-magnetic layer sandwiched in between.When an electron passes through a magnetic field its spin state may change, known as scattering. Where electrons have random, scattered spin states this creates greater resistance to electric current.By aligning electrons' spin state to that of the magnetic field in the layers of the drive head, GMR technology dramatically reduces resistance, speeding up data transfer. First introduced by IBM in 1997, GMR technology has led to faster and higher-density drives than was previously possible.

PUTTING A FRESH SPIN ON MEMORY

Spintronics researchers have since been working on introducing the same technology to computer memory, aiming to replace electric current-based dynamic random access memory (DRAM) with magnetic RAM (MRAM). The first commercial product by Everspin has been used in Airbus aircraft and BMW motorbikes due to its reliability under heat stress or cosmic-ray exposure – something that affects aircraft cruising at high altitudes.

MRAM exploits the same spin-based magnetic field approach, but uses a magnetoresistance cell to store data rather than a spinning disk platter as in a hard drive. While it is not as fast as DRAM, magnetic cells are able to maintain their stored spin orientations, and so the data they represent, without power. MRAM is likely to replace commonly used flash memory such as SD cards and compact flash first, as it is faster and doesn't suffer from flash memory's limited lifespan.Other manufacturers such as Intel, Qualcomm, Toshiba and Samsung are developing MRAM to use as processor cache memory, where by virtue of their smaller size MRAM chips of greater capacity can be incorporated into smaller packages that will be faster, and use up to 80% less power than current cache memory.

As electronics approaches the limits of silicon, spintronic components will play an important role in ensuring we enjoy steady performance gains, and faster, higher-capacity storage at lower power and cost.

Contributed by,
ASHWINI.A
(ECE-A)III yr

Innovation is our tradition Come Experience,
Cherish and Transform

VELAMMAL
INSTITUTE OF TECHNOLOGY

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