SSN COLLEGE OF ENGINEERING

DEPARTMENT OF BIOMEDICAL ENGINEERING

SYNERGY

VOLUME- 5
ISSUE - 1

EDITORIAL DESK:

Our quarterly edition of SYNERGY is back once again with the highlights of our Biomedical Department over the past 3 months.

This edition focuses on the National Conference on Advancements in Biomedical Engineering and Sciences (NCABES - 2016) held on 3rd - 4th March 2016 deliberating with renowned experts and also the National Biomedical Lecture Series – March & April 2016

Along with the staff and student activities, this magazine is special in the way that it also highlights on SSN BEST

We will be back next time with more achievements of our department.

Best wishes,

Editorial Team

Looking inside:

STAFF ACTIVITIES:

SEMINARS AND WORKSHOPS ATTENDED:

- Mrs. M. Dhanalakshmi, Asst. Prof, attended **"Winter School on Speech and Audio Processing (WISSAP 2016)"** organized at SSN College of Engineering.
- Mrs. J. Delpha, Asst. Prof and Ms. D. Kanchana, Asst. Prof, attended DBT-sponsored two-day workshop on **"Emerging trends in Bio-Signal and Image Processing"** at Avinashilingam University, Coimbatore.
- Mrs. J. Delpha, Asst. Prof and Ms. D. Kanchana, Asst. Prof attended NHHID - One day symposium on **Present and future of Health Care Instrumentation-Clinical and Technology perspective** - at Kilpauk Medical college, Chennai.
- Mrs. K. Nirmala, Asst. Prof and Ms. R. Nithya, Asst. Prof attended a two-day workshop on **"Research prospects in image fusion and Registration"** held at the Department of Information and technology, SSN college of engineering.
- Dr. V. Mahesh, Asso. Prof, Mrs. B. Geethanjali, Asst. Prof and Ms. R. Nithya, Asst. Prof attended **"8th Edition of TANCARE"** (Tamil Nadu Health Care) organized by FICCI Tamil Nadu State Council at The Hilton, Chennai.
- Ms. D. Kanchana, Asst. Prof has attended the **2016 IEEE mini POCO** (Panel of Conference Organizers) sponsored by R10 Asia Pacific Region and IEEE Madras Section at Hotel Deccan Plaza, Chennai.

SEMINARS ORGANISED:

- The **Centre for Healthcare Technologies** & Department of BME organized a seminar by **Prof. Bing- Hao Luo,** Louisiana State University, USA. Dr. Mallika Jainu co-ordinated the programme.

Prof Bing-Hao Luo

Dr A.Kavitha (HoD) felicitating the speaker.

PAPERS PUBLISHED:

- R. Yuvaraj, M. Murugappan. Presented a paper on "**Hemispheric asymmetry non-linear analysis of EEG during emotional responses** from idiopathic Parkinson's disease patients", Cognitive Neurodynamics, 2016 (IF = 1.671-In press).
- Sriranjani S., Mrs. Geethanjali B. and Dr. S. Pravin Kumar., Presented a paper on "**Effect of Guided Meditation on Working Memory. "**Aust. J. Basic & Appl. Sci., 9(33): 110-114, 2015 SJR 0.15 ;SNIP :0.23 (ANNEXURE II) Dec 2015.
- Guhan Seshadri N.P, Mrs.Geethanjali B, Dr. Pravin kumar S, Adalarasu K., Presented a paper on "Wavelet Based **EEG Analysis of Induced Emotion on South Indians.**" Aust. J. Basic & Appl. Sci., 9(33): 156-161, 2015 SJR0.15 ;SNIP :0.23 (ANNEXURE II) Dec 2015
- Meenachi.P, Subashini . R ,Presented a paper on **"Synthesis, Characterization and performance of Hydroxyapatite coated 316 L stainless steel"** in the Journal of Chemical and Pharmaceutical Research, 2016, 8(3):340-347 ,ISSN : 0975-7384 (ANNEXURE II)
- S. Vidhusha, Dr. A. Kavitha, Presented a paper on **"Evaluation of Functional Connectivity patterns in high-functioning Autism using resting state fMRI",** In the 2nd International Conference on Biomedical Systems, Signals and Images, IIT Madras, Chennai.
- Bhuvaneshwari B., Dr.Kavitha A., **"Assessment of Brain Connectivity Patterns in Progression of Alzheimer's Disease",** In the 2nd International Conference on Biomedical Systems, Signals and Images, IIT Madras, Chennai.
- C. Sandhya, R. Anandha Sree, Dr.A. Kavitha, **"Analysis of Speech Imagery using Consonant-Vowel Syllable Speech Pairs and Brain Connectivity Estimators",** 2nd International Conference on Biomedical Systems, Signals and Images, IIT Madras.
- S. Usha Rani, M.Chitra, R.Anuradha, Mallika Jainu, **"In vitro cytotoxity effect of methanol extract of wattakaka volubilis (leaf) against breast cancer cell line"** International Journal of Advanced Research (Jan 2016), Volume 4, Issue (1): 44- 49 (IF:4.58).
- Nirmala K,Venkateswaran N and Vinoth kumar C,**"Fractal feature based SVM classification of glaucomatous image using PCA and Gabor filter ",** International Journal of Advanced Engineering Technology ,Vol. VII/Issue I/Jan.-March.,2016/156-160

- Sivaramakrishnan Rajaraman, Mallika Jainu, Gnanaprakash Dhakshinamoorthy **"Ocimum basilicum linn. essential oil coated biomaterial surfaces prevent bacterial adhesion and biofilm growth"** , Asian Journal of Pharmaceutical and Clinical research. 9(3): Mar 2016.

OTHER ACTIVITIES:


Dr V.Mahesh


Ms B. Geethanjali

- Dr. V. Mahesh, Asso. Prof and Mrs. B. Geethanjali, Asst. Prof gave a talk on "Engineering Education & Research Seminar" at Chennai organized by NI, Bengaluru on 22.3.16
- Dr. R. Yuvaraj, Asso. Prof attended the first doctoral committee at Dept of Production Technology, MIT campus, Anna University for the Ph.D scholar Ms. S. Sridevi (Reg no. 1622239277) as a DC member.
- Dr. R. Subashini, Asst. Prof, as supervisor, conducted the first Doctoral Committee meeting for the Ph.D. scholar, Ms. R. Anitha (Reg.No. 1623599128) at the Conference Hall, Department of Biomedical Engineering.
- The first Doctoral Committee meeting for the Ph.D. scholar, Mr. Ramanathan A.K. (Reg.No. 1614499167) was conducted on 24.02.16 . Supervisor of the candidate, Dr. S. Pravin Kumar, Asso.Prof and DC members Dr. V. Mahesh, Asso. Prof and Dr. M. Jagannath (Dept. of School of Electronics Engineering, VIT Chennai) attended this meeting.
- Dr. A. Kavitha, Prof & Head , has been appointed as a member of the Board of Studies of the Affiliated Institutions under the Faculty of Information and Communication Engineering of Anna University, Chennai.
- Dr.Mallika Jainu, AP conducted DC meeting for her Ph.d scholar M.GAYATHRI (Register No: 10011) on 19.3.16 at Department of Biochemistry, Bharathiayar University.

STUDENT ACTIVITIES:

WORKSHOPS/SEMINARS ATTENDED:

- I & II M.E Medical Electronics students attended a **one-day workshop on Best practices in development and maintenance of hospital equipment** conducted by fluke in Anna University on 8.2.16

FLUKE WORKSHOP:

- I M.E Medical Electronics students attended a **One day National Seminar on Predictive analysis : Big data and Healthcare** at department of CSE-SSNCE on 12.2.16
- I & II M.E Medical Electronics students attended a **one-day workshop on LATEX software** conducted by SSN CSI student chapter on 17-18 February,2016.

LATEX WORKSHOP

- T.Sathya Priya, K.Sunanda, S.Sushmitha, Vaishnavi.G, Chitra.R, V.Vinisha, Ramya.B of 3rd year participated in the **Eye controlled Robots workshop** conducted by LI2 innovations, held at Anna University on 19,20th Feb 2016, Chennai.

Devishree.T

- Devishree.T –II M.E has been an **observer of Dialysis Machine** at **Global Health City**—Chennai from 24th –26th Feb , 2016

STUDENT ACTIVITIES:

WORKSHOPS/SEMINARS ATTENDED:

- Vishal S.B and Sushmitha.S of 3rd year, Harshini.S and Vijay Manishankar.L of 2nd year , Kapardi.M , Thamizhvani.T.R of I M.E participated in the **Natural Radioactivity and Radiation Sources Workshop** conducted by IGCAR on 22.2.16 , Chennai.

- Kapardi.M , Vishnu Priya.K, of PG attended the **2nd International conference on Biomedical Systems, Signals and Images (BSSI 2016)** on Feb 24th -26th ,2016 held at IIT, Madras

VISHNUPRIYA

KAPARDI.M

- R.Haripriya, V.Sandhya, K.Bhargavi of 2nd year participated in the **Image Processing workshop** conducted at NIT on 27.2.16, Trichy.

- I M.E Medical Electronics students attended a **Two day National workshop on Image processing and Computer vision** conducted by Department of Computer science, Amritha University during 18th - 19th March 2016

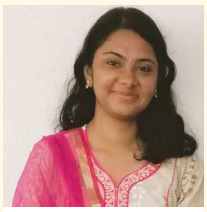
- Angel Jenifer.P -II M.E participated in the Two day workshop on **"Internet of Things : Hands on with Raspberry Pi"** on 22nd , 23rd March 2016 in the Dept of IT/SSNCE

- Gayathri Devi.S and Deepika.S have been selected for an **Internship programme by Medofes** for the time period April 2- May 26,2016.

DEEPIKA.S

GAYATHRI

PAPERS PRESENTED:



BHUVANESHWARI.

MEENACHI.P

- Bhuvaneshwari.B of M.E final year presented a scientific paper **"Assessment of Brain Connectivity Patterns in Progression of Alzheimer's Disease "** in the 2nd International Conference on Biomedical Systems, Signals and Images 2016 held at IIT, Madras.
- Meenachi.P of M.E final year presented a scientific paper "**Study of hydroxyapatite coating on 316L SS by electrophoretic deposition method".** In the National Conference on Biomaterials in Medicinal Chemistry held at Madurai Kamaraj University

PLACEMENT DETAILS:

We congratulate the following Final year students for getting placed.

- Mr R. Vignesh got placed in **Mckinsey & Company**.
- Ms. Abisha P and Raagavi R got placed in **Astrazeneca India.**
- Vallabhi Venkatesh, Sushmitha , M Sruthi got placed in the **Mu Sigma**.
- Prabanjan.P got placed in **BA Continuum corporate.**

SSN BUSINESS ENTREPREURSHIP IN SCIENCE AND TECHNOLOGY (SSN BEST) :

SSN BUSINESS ENTREPREURSHIP IN SCIENCE AND TECHNOLOGY (BEST) CENTRE AND INDUSTRY INSTITUTE PARTNERSHIP CELL (IIPC) conducted project idea contest on 23.03.16 at BME Seminar Hall, following are the winners of the competition.

TEAM MEMBERS	DEPARTMENT	PRIZE	PRIZE MONEY
REKHA J	Civil	I	Rs. 4000
SHRIJA A	Civil		
RAMYA	Civil		
DEEPIKA R	BME	II	Rs. 3000
VARNA SURESH	CSE		
SAI VARYA MAHADEVAN	CSE		
PRATHYUSHA R	BME	III	Rs. 2000
SANJHANAA R BHATT	BME		
NARTHANA	BME		

OTHER ACTIVITIES:

- Dixit of 3rd year went on a trekking trip to the Himalayas on Dec 2015 – Jan 2016 .

Dixit along with his Trekking Crew in the Himalayas

- B.N.Shaalu Sree of 2nd Year won the 2nd prize in carom tournament of SSN inter year sports meet for the year 2015 to 2016.

- Aashika.N, Aishwarya Sree of 2nd year and Vallabhi, Sneha Nair of final year as part of the N2K dance team won the following prizes :

  2nd prize in Loyola College, chennai

  3rd prize in Women Christian College, chennai

  2nd prize in VIT, Chennai.

Aashika.N, Aishwarya Sree,Vallabhi, Sneha Nair in N2K dance team

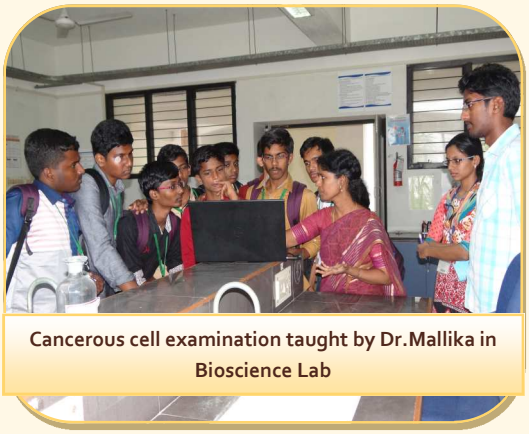
INSPIRE CAMP:

An 'inspire camp' was supported by the Department of Biomedical Engineering on February 6, 2016 for the students of classes XI and XII from various schools. They were given practical demonstrations of concepts related to Biomedical Engineering.

A GLIMPSE OF THE PROGRAM:

- To begin with, students demonstrated the tissue biopsy methods in the **Bio-Science lab,** wherein they observed the differences between normal cells and cancerous cells under a microscope,. Sahli's method to detect the hemoglobin in blood was also explained. The students were also taught practically about blood grouping and Rh factor.

Blood grouping taught by Nithin and Pushpika of 2nd year in Bioscience Lab



Cancerous cell examination taught by Dr.Mallika in Bioscience Lab

- In the **Bio-medical Instrumentation Lab**, the students were taught with simple circuitry, to detect and measure the velocity of blood flow using Doppler method. They were also shown the principle behind Diathermy of Electrical Surgical Unit (ESU), ECG amplifier (a Physiograph technique to measure ECG and pulse counts), Spirometry, telemetry with a Bio-metry receiver, audiometry to measure any ear defectiveness, and patient monitoring system.

- The **Medical Software lab** , students learnt the simple concepts of signal amplification and modulation with the help of filters. The basics of Digital Signal Processing and Micro Processor Micro controller were also taught in a comprehensible way.

Micro processor and micro controller explained by Archana of final year in Medical Software Lab

Laminar air flow chamber demonstrated by Deepthi of PG

- In the **Tissue engineering lab,** the principle, working and the applications of the following equipment were shown along with a physical demonstration: incubators, auto clave machines, laminar air flow chamber, fluorescent microscope, centrifuge, deep freezer, hot air oven and magnetic stirrer.

- In the **Diagnostics and therapeutic equipment lab,** the working of various medical equipment used in hospitals nowadays, was thrown light upon. The very important and commonly known equipment like pacemaker, defibrillator, ventilator, infusion pump, ultrasound and short wave diathermy and acquisition of bio-signals like ECG, EMG were displayed and discussed.

EMG analysis explained by Roshini and Bhavatharani of 3rd year in BMI Lab

Few highlights of Inspire Camp

Natarajan and Suganraj of 2nd year explaining Sahli hemoglobinometer in BioScience Lab

Tamizhvani T R & Sivaranjini—I M.E explaining Pacemaker in DTE Lab

Ventilator working explained by Saravana Prakash of final year in DTE Lab

Working of defibirillator explained by Krishna Priya and Thariga of 3rd year in BMI Lab

Centrifuge techniques explained by Vardhini of PG in DTE Lab

Diathermy principles explained by Sathya Priya of 3rd year in BMI Lab

Microscope was demonstrated by Pavithra of 3rd year in Tissue Engineering Lab

NCABES 2016:

An ICMR sponsored National Conference on Advancements in Biomedical Engineering and Sciences (NCABES-2016) was held in our department on March 3rd and 4th.

This conference was aimed at motivating students to transform their theoretical knowledge into practical biomedical products which will help the society by bridging the gap between the doctors and engineers. The conference also created an environment for the scientists, researchers and students from all over the country to share their ideas, experiences and results of their scientific research work and showed the way for research collaboration.

It was organized by BME dept in association with Center for Healthcare Technologies (CHT).

THE INAUGRAL OF NCABES 2016

From left to right: Dr.Sivarama Krishnan (Asso.Prof/BME), Dr.Yuvraj (Asso.Prof/BME), Dr.Narayana Kalkura (Guest of Honour) , Dr.Alok.R.Roy (Chief Guest), Dr.Kavitha (HOD)

KEYNOTES OF THE PROGRAMME:

On 03.03.16:

1. The first speaker of the day was **Dr. Alok R. Ray,** Consultant Professor at School of International Biodesign, AIIMS, Delhi. He is also the Executive Director of Stanford-Indian Bio-design program who spoke on the **development of affordable medical devices.**

GLIMPSE OF THE TALK:

- This presentation described development of indigenous medical devices and also gave glimpses of medical devices which have been developed under the 'India Bio-design program' at IIT, Delhi and AIIMS, Delhi in collaboration with Stanford University, USA.
- The focus of the presentation was on various medical devices which were designed by him like, a novel device to manage fecal incontinence that improves clinical outcome and reduces operating cost of hospitals, a simple and cost effective device to access intra-osseous cavity in long bones to administer fluids during emergency, a novel low cost device for pre-hospital care and Transfer life is the next generation of medical bed sheets.

2. This was followed by a talk by **Dr. S. Narayana Kalkura,** Director and Professor, Crystal Growth Centre, Anna University Chennai on **Investigations on nanobiomimetics and biomaterials.**

GLIMPSE OF THE TALK:

- The controlled selective precipitation results in the biomineralisation of crystalline and amorphous materials of organic and composite inorganic organic nature.
- The physical, chemical, and biochemical process of biominerals are leading to new concepts of crystal engineering and materials science.
- Biomimetic technology which is mimicking the natural technological process is now considered as one of the thrust areas of research.
- An overview of the recent trends in nanobiomimetics research along with advances in the preparation of calcium phosphate for bone and dental replacement was presented.

3. **Dr.K.Purna Sai,** Senior scientist and Head, Assistant professor, Biological Sciences , ACSIR gave a talk on **Basic Insights and application of biomolecules in Tissue Engineering.**

GLIMPSE OF HER TALK:

- Healing of wounds requires a complex cascading of events leading to complication and chronicity.
- Wide range of polymers both natural and synthetic have gained special interest owing to their biocompatibility, bulk availability and cost effectiveness.
- A combination of the bioactives with suitable biocompatible polymers (both micron and nano sized) may lead to positive outcome.
- The significance of such a combinatorial multi-phased delivery system would fetch a new class of therapeutics to attain desired clinical outcomes ranging from tissue engineering to chemical and biosensors.

ON 4.3.16:

1. **Dr. Goutam Thakur ,**an Associate Professor in the Department of Biomedical Engineering, Manipal Institute of Technology, gave a presentation on **Role of Cross-linked Gelatin Gel Matrices as Carriers for Drug Release.**

GLIMPSE OF THE TALK:

- The focus of the presentation was on various cross-linked gelatin -based carrier matrices that are exploited for drug delivery systems.
- The talk covered development, characterization of gelatin based gels acting as carriers for the delivery of bioactive agent (indomethacin; model anti-inflammatory agent).
- Controlled release systems and the underlying mechanisms along with mathematical modeling were also outlined to show the various means by which target compounds are released from cross-linked gelatin based systems.
- Further, biocompatibility of the cross-linked matrices was discussed in his presentation.

2. **Dr.Balasubramanian Raman** Associate Professor in the Department of Computer Science & Engineering and Head of the Computer Centre at IIT, Rookie gave a talk on **Medical imaging in Visualization and Content Based image Retrieval.**

GLIMPSE OF THE TALK:

- In his talk, he briefly described the applications of curve skeletons in the field of Medical Imaging.
- The details of algorithm to obtain the curve skeletons were discussed.
- The demonstration of finding the centerline of the colon and the unwinding of colon was shown.
- The applications of Content Based Image Retrieval in the field of Medical Imaging were also discussed.
- Several methodologies/algorithms in CBIR were shared with the audience.

Organizers of NCABES — 2016 along with the Participants and Volunteers

NATIONAL BIOMEDICAL LECTURE SERIES:

Dr.Tanuja Britto

BRIEF NOTE ON THE SPEAKER:

A lecture on **LASERS IN OPHTHALMOLOGY AND OCT** was given by **Dr.Tanuja Britto,** Professor and Head ophthalmology department, Joseph Eye Hospital , Trichy. on the 7th of March. She is the Professor and Deputy Director of CBR.

A GLIMSE OF THE SESSION:

The lecture mainly focused on Post-Graduate Medical Electronics Students and students from under-graduate program. The various topics covered during the session are:

- Different type of lasers used in ophthalmology, Laser Tissue effects, Delivery systems, Uses of Lasers-(Diagnostic and Therapeutic), Photocoagulation, Laser Trabeculoplasty, Retinal Vasculitis, Laser for Retinal tear, Diabetic Retinopathy, Laser Photo ablation, Laser photo-chemical effects, OCT and its features

Dr Tanuja Britto Interacting with the students

BRIEF NOTE ON THE SPEAKER:

A talk was given by **Dr.P.A. Baskar** on **"VISUAL EVOKED POTENTIALS - PRINCIPLE AND CLINICAL APPLICATIONS"** on the 9th of March at seminar hall of BME dept. He is the Emeritus Professor Neurology, Dr.MGR Medical University and Senior Consultant Neuro-physician.

Dr.P.A.Baskar

Ms Geethanjali.B Asst prof honoring Dr P.A Baskar

A GLIMSE OF THE SESSION:

The various topics discussed in the session were Visual Pathways , Neuronal Circuitry for Vision And visual Evoked Potential(VEP).

NATIONAL BIOMEDICAL LECTURE SERIES: Contd...

A talk was given by **Mr. R. Ranjith,**, Principal, MERF-Institute of Speech and Hearing, Chennai on the topic restoration hearing through technology on 23rd march 2016 at BME seminar hall.

BRIEF NOTE ON THE SPEAKER:

Mr R. Ranjith

- He is one of the founder members of **Cochlear Implant Group of India** (an exclusive club of surgeons, audiologist and habilitationist) and also Hearing Group (Comprehensive Hearing Implant Centers) for research and development.
- He has been working in the field of **Implantation Audiology** for 19yrs. He is involved in academic teaching for more than 9 years. He has guided dissertations for students of Engineering and Audiology. He has authored more than 20 papers and co-authored several papers which were presented in national and international conferences

A GLIMSE OF THE SESSION:

Mr.Ranjith interacting with the students

- Instruments used in diagnosis and therapy such as Puretone Audiometer, Immittance Audiometer, Otoacoustic Emission Analyzer, TT EABR montage and setup, Hearing aids, Assistive listening devices , Bone conduction hearing implants, Middle ear Implants, Cochlear Implants, Auditory Brainstem Implants
- Various case studies on hearing impairments, Importance of sensitivity and specificity instruments

NATIONAL BIOMEDICAL LECTURE SERIES: Contd...

Dr.R.Vasanthakumari

BRIEF NOTE ON THE SPEAKER:

A lectue talk was given on **"Polymers for medical applications: Macro to nano". By** : **Dr.R.Vasanthakumari, Director, Polymer Nano Technology Centre, B.S.Abdur Rahman University.**

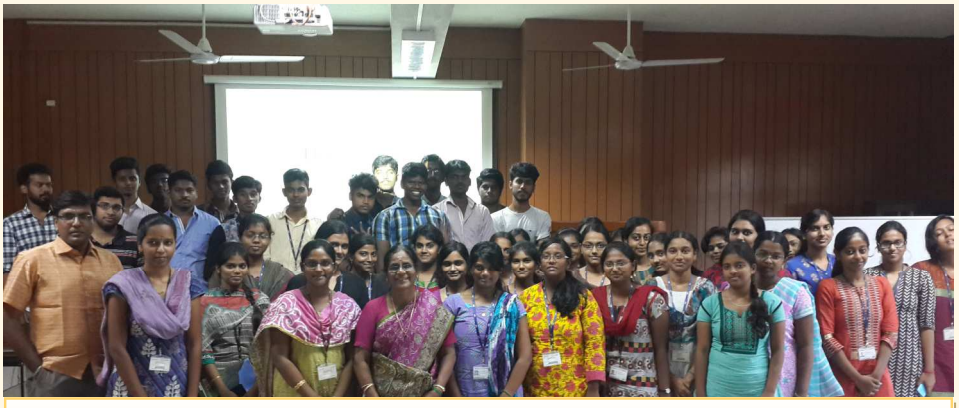
The following topics were covered in the lecture:

- Introduction to polymers, Biomimetics, Natural and synthetic polymers (biopolymers) used in biomedical applications, Electrospinning process and nanofibers, Sustained drug delivery, Polymers used in implants and prosthetics, Pressure-sensitive adhesives

Dr Sivaramakrishnan Asso.Prof felicitating the speaker

She also motivated the students to take up projects in this very significant field. Some of the project ideas she hinted at are:

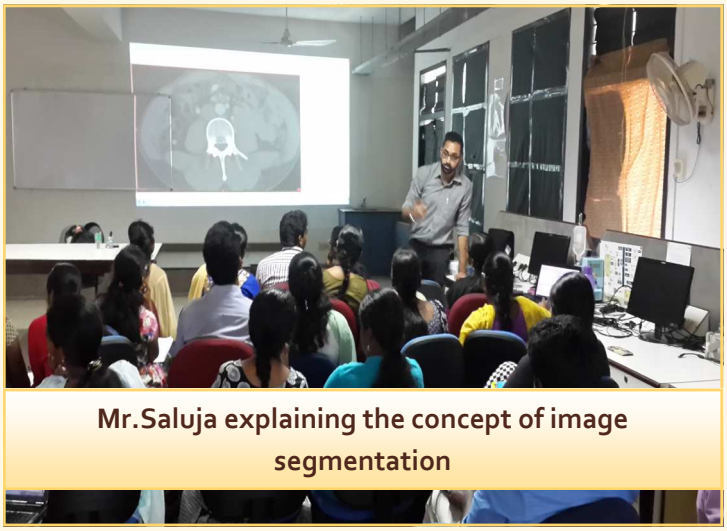
- Smart textile to monitor heartrate, pulse rate, temperature, etc., Audible thermometer, Home healthcare devices, Portable dialysis unit



Group photo after the session with **Dr.R.Vasanthakumari**

MIMICS WORKSHOP:

- A MIMICS workshop was organised in the Diagnostic and therapeutic laboratory, BME Department on 25th February,2016.



Mr.Saluja explaining the concept of image segmentation

- MIMICS is an image processing s oftware for 3D design and modelling developed by *Materialise NV,* a Belgian company.
- Mr. Arpan saluja, Application Engineer, Materialise - Malaysia demonstrated the use of MIMICS for image conversion and segmentation and 3-Matics for meshing.
- The workshop was conducted for selected UG & PG students, trial version of the software was installed and the concepts were explained.

DIGITAL SIGNAL PROCESSING WORKSHOP:

A two day workshop on Digital Signal Processing was held on 22nd and 23rd of February. The workshop was conducted by Dr.Suresh from VIT and organized by the Department of Biomedical Engineering.

- On the first day, the workshop began with an introductory session on DSP Processors. The students were then made to work with the TMS 320DSK6713 DSP processor. By the end of the day, the students had got a clear idea on how to execute simple programs using the same.
- On the second day, more complex programs such as how to interface hardware with code composers were discussed.

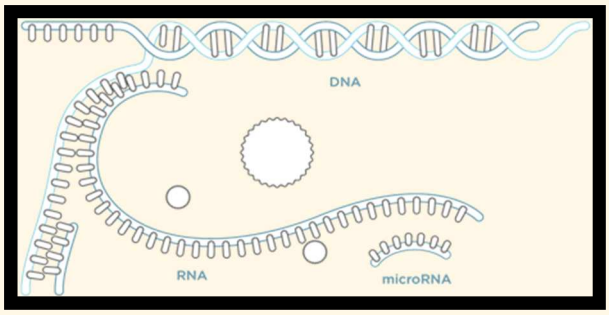
Dr Suresh teaching DSP to III year students

ADVANCEMENTS OF EARLY CANCER DETECTION:

EARLY DETECTION, often told, is the surest way to beat cancer. It's the reason why, year after year, men and women of a certain age dutifully visit their doctors and undergo uncomfortable tests to screen themselves.

What about the several hundred or so types of cancer out there—the brain cancers, the ovarian cancers, the leukaemia and lymphomas? And what of the millions of young people who never get tested at all, even though they've been found to have worse outcomes than adults? Cancer is a major public health problem with world-wide over 12 million of new cancer cases diagnosed and over 7 million cancer-related deaths each year . The major challenges of this disease are (i) early detection, (ii) improved patient stratification and (iii) therapy response prediction. Improvements in these areas hold promise to result in a more favourable disease outcome for the patients.

Current diagnostic methods for other cancers are invasive and expensive, so the vast majority of cancer patients never realize they might have cancer until



something goes wrong with their health. By that point, in many cases, it's already too late.

That's why a new start-up, dubbed Miroculus, is building a device that could easily and affordably check for dozens of cancers using a single blood sample. Known as Miriam, this low-cost, open source device made its public debut at the TED Global conference in Rio De Janeiro.

For the company's founders—a global team of entrepreneurs, microbiologists, and data scientists—the goal is to make Miriam so simple that even untrained workers in clinics around the world could use it. The project is still in the early stages, but if the early trials of Miriam are to be believed, Miroculus could make regular cancer screenings as simple as getting blood drawn.

The Miroculus technology is based on microRNA, a class of small molecules that can act as a type of biological warning sign, appearing and disappearing based on what is happening in our bodies at that moment

MicroRNAs are small RNA molecules, whose primary role is to regulate the expression of our genes (genetic material) in the cells. In other words, microRNAs reflect a person's health status and can therefore be used as biomarkers for various diseases, including cancer.

The investigation of circulating microRNAs in various types of cancer followed and a myriad of microRNAs with diagnostic, prognostic and predictive capabilities were identified . For example, a panel of seven circulating microRNAs was found to be able to distinguish between plasma samples from healthy women and those with breast cancer . These circulating microRNAs even showed promise for the detection of benign and early stage breast tumors . Similarly, for lung cancer a plasma microRNA signature has been devised with the capability of detecting cancer even in asymptomatic patients before clinically evident disease onset .

Circulating microRNAs have several advantages over some other biomarker types. MicroRNAs are highly stable in body fluids, even in non-ideal sample handling conditions, under which most other molecules would degrade. Further, circulating microRNAs are easily accessible and can be measured repeatedly over a period of time in an essentially non-invasive manner (blood-based test). Finally, considering that there are over 2000 different microRNAs in the human genome.
Pay Christodoulou was one such researcher. After spending years studying micro RNA's effects on evolution, Christodoulou, a Greek molecular biologist, shifted her focus to study the connection between microRNA and thyroid cancer. Last year, she decided to take some time off to enter a graduate studies program at Singularity University, a Silicon Valley incubator that challenges people to spend 10 weeks developing a business idea with the power to impact one billion people or more.

It was there that she met Alejandro Tocigl, a Chilean entrepreneur; Gilad Gome, an Israeli biotechnologist; Pablo Olivares, a Chilean doctor; Ferrán Galindo, a serial entrepreneur from Panama; and Jorge Soto, a Mexican electronic engineer and former general director of civic innovation for the Mexican government. Together, they formed a team and developed the bones of what would eventually become Miriam.

Miriam capitalizes on much of the research and science that already exists around microRNA and cancer. You can prepare the blood sample, for instance, using a standard off-the-shelf RNA extraction kit, as well as a Miroculus "master mix" (another means of preparing the raw sample for the test). Then, once the sample is prepared, you pipette the blood into a 96-well plate, That's because each well has been pre-treated with Miroculus's patented biochemistry to act as a sort of trap for various types of microRNA, most commonly associated with cancer. When Miroculus goes to market, it will be these plates and not the $500 devices themselves that will generate the most revenue. After the wells are full, the plate goes into the device, and the reaction begins. When microRNA is present, the wells start to glow. The stronger the glow, the stronger the presence of microRNA. In an hour, the reaction is complete, and the results get sent to a cloud server. There, the system reads the luminosity of the various wells, determines which microRNA is present in the sample, and compares that result to a database of information on which microRNA patterns are associated with which cancers. Then the system is able to make a judgment. While at Singularity, the team completed a proof of principle experiment, in which they successfully detected liver cancer in mice. The methods regularly to provide real time data interpretation with high accuracy. Our data analysis platform lets you visualize trends and correlations over time, stratify patients, view results in real time and add other contextual information

The company—which is now run full-time by Tocigl, Christodoulou, and Soto must also build its database to ensure the system can read the results accurately. The challenge with microRNA, he says, is that it doesn't only show up in the case of cancer. Something as simple as taking aspirin or having a respiratory infection could affect which microRNA gets expressed in blood. To guarantee accuracy, Miroculus's technology must know not only which results mean cancer, but also how other health conditions, medications, and environmental factors can alter or inhibit those results.

Source: www.miroculus.com, www.wired.com

BY,

BHARGAVI.K, 2ND YEAR

ACCIDENTAL DISCOVERIES

AN ADDICT DISCOVERS THE KEY TO PAINLESS SURGERY-ANESTHESIA

Before the invention of anesthesia the medical procedures were painful as we could not imagine. There was a time when all the pain alleviation involved in surgery was a little cotton wool in the surgeon's ears to keep the screams of the patient from hurting them. Fortunately, things have changed.

Before the invention of anesthesia the surgery was done in this manner

Humphery Davy

Humphery Davy wasn't just an incorrigible party boy -- he was also sort of a self-taught genius, notorious for conducting experiments on himself. And in 1799, he thought he'd try his hand at finding the cure for hangovers by getting addicted to nitrous oxide. He not only launched a laughing-gas craze among the upper also published a scientific paper documenting the effects of the gas, which was taken seriously by just about no one .

THE DISCOVERY:

At one point, Davy found himself with a raging toothache. He sucked on a little nitrous, as he probably would have done anyway on account of his addiction, and discovered that the pain of the toothache floated away like a newspaper kite on a windy day. So at the end of his research paper Davy casually suggested the gas could be used for painless surgeries.

And nobody believed him. Not only did no one believe him but the doctors at that time thought that pain during surgery was a good thing a patient's yelps encouraged doctors to get faster and more efficient, apparently, and it was believed that the pain would somehow help patients heal themselves post-surgery. It took 40 whole years before anyone revisited Davy's idea that surgery didn't have to hurt. And it's fortunate

The Event which booned - A glimpse of the Davy`s event when everyone inhaled Nitrous oxide gas which made them enthusistic.

that someone did -- otherwise, most of us would be walking around with teeth that looked like a spilled bottle of Tic Tacs.

SOURCE: **History of medicine- blatner.net**

BY

B.N.SHAALU SREE, 2ND YEAR

THE ACCIDENTAL DISCOVERY OF STETHESCOPE

René Laënnec, a physician at the Necker Hospital in Paris, specializes in diseases of the chest. Two events in 1816 give him the idea for a significant contribution to medical practice.

Walking in a courtyard of the Louvre he sees children playing an acoustic game with a long strip of wood. A boy scratches one end of the wood; his friend, with the other end to his ear, hears the sound clearly. Soon after this Laënnec is visited by a female patient too plump for her heart-beat to be easily discernible but too young for him to press his ear to her chest with decorum. Following the example of the boys, he rolls a sheet of paper into a tube. He places one end gently on the lady's bosom and the other to his ear.

Laennac using the first stethoscope with a patient

Laënnec is surprised to discover that through the tube he hears the heart with much greater clarity than with his ear to a patient's chest. He has stumbled upon the principle of the stethoscope (from Greek*stethos*chest,*scopein* to observe).

Laënnec now constructs a hollow wooden tube, about nine inches long with ends designed to fit snugly against the chest and into the ear. He spends three years analysing the weird and often tumultuous sounds which reach him as patients breathe. At first he has no way of interpreting them. But he notes the variety of noises heard in terminally ill patients, and in subsequent post mortems he observes the condition of their lungs and heart.

By this means Laënnec is able to identify and describe the characteristic sounds of various stages of bronchitis, pneumonia and - increasingly important as one of the most prevalent diseases of the 19th century - tuberculosis. Laënnec's researches are published in 1819 in*Traité de l'auscultationmédiate*(Treatise on Mediate Auscultation). Auscultation, or listening to the body for diagnostic purposes, has until now always been 'immediate' - with the physician's ear pressed to the patient's body. The stethoscope becomes the mediating instrument.

Later in the century a tube of rubber is found to be more convenient. Then several modern versions of stethoscopes has been emerged.

Camman’s binaural stethoscope in1900

W.H.Hill’s stethoscope used in1890

SOURCE: www.historyworld.net

The modern stethoscope

BY

B.N.SHAALU SREE, 2ND YEAR

UPCOMING EVENTS:

- **SYNERGY'16,** a symposium of NIT, Tiruchirappalli is conducted on 14th April. Find more details in the following link http://synergy.nitt.edu/#!

- **International Conference on innovations in Communications and Computer Science Engineering, ICICCE'16,** is conducted by Coimbatore Institute Of Technology at Coimbatore on 17th April, http://icicce.com/

- **ICONTECH 2016**, A conference conducted by SCSVMV university Kanchipuram on 5th May, for more details visit: http://kanchiuniv.ac.in/

- **International Conference on Advances in Emerging Technology ICAET 2016,** conducted by Jaya Engineering College Chennai on 7th May, visit http://icaet.co.in/

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