

# SYNERGY

DEPARTMENT OF BIOMEDICAL ENGINEERING  
SSN COLLEGE OF ENGINEERING

JANUARY- FEBRUARY-MARCH 2013

## EDITORIAL

Each passing year brings with it a change. A handing down of the mantel. So here we are, with a new vision and a new look.

Like always this issue of Synergy would bring forward the best and the brightest of the department. We are truly proud of them. We have a line-up of achievements and event happenings from all around the department featuring mainly the ICBSII, 2013. The department also saw a host of lectures for the students taken by experts and they were inspirational.

We would also like to wish the seniors passing out this year, the very best and hope that they shine in all their future endeavours. So until next time when it gets bigger and better.

- the "new" Newsletter team

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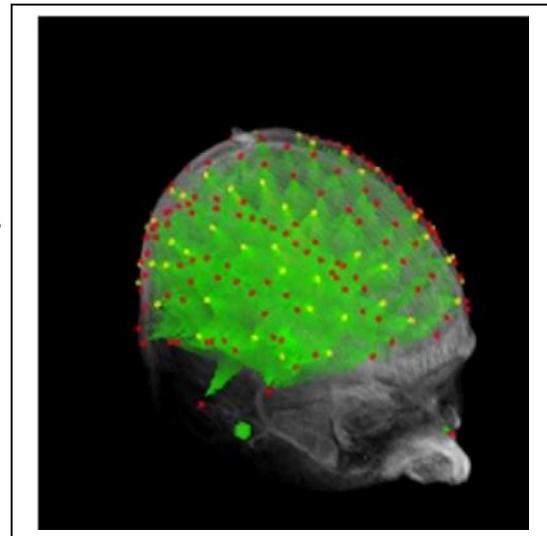
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# New Priorities for Future Biomedical Innovations

Victor R. Fuchs, Ph.D.

Before World War II, most of the gains resulted from improvements in nonmedical factors: nutrition, sanitation, housing, and public health measures. Since World War II, however, biomedical innovations (new drugs, devices, and procedures) have been the primary source of increases in longevity. These innovations have also been the most important reason why health care expenditures have grown 2.8% per year more rapidly than the rest of the economy over the past 30 years. Will the future simply be a rerun of recent decades? Probably not.



Current demographic, social, and economic forces will create new priorities for future biomedical innovations: more emphasis on improving quality of life and less on extending life, and more attention to value-enhancing innovations instead of pursuit of any medical advance regardless of its cost relative to its benefit. Society may not pursue further gains in life expectancy as vigorously as we've done in the past, because there has been a dramatic shift in the age at which the increased years of life are realized (see bar graph). In the early decades of the 20th century, approximately 80% of the gains in life expectancy were realized before the age of 65 years and only 20% at 65 years or older. Now the situation is reversed — almost 80% of recent gains in life expectancy are realized at an age of 65 years or older. The main reason for the change is the sharp decline in rates of death at younger ages; thus, an ever-larger percentage of each birth cohort survives to at least 65 years of age. At the beginning of the 20th century, given the age specific mortality rates of that time, only 41% of the birth cohort could expect to reach 65 years of age. A diminished focus on developing innovations that increase life expectancy could and should be accompanied by greater pursuit of innovations, such as joint replacement, that improve the quality of life for both the elderly and the near-elderly.

Along with the shift in emphasis to developing future innovations that enhance quality of life, there is a growing need for a shift to value-conscious innovation instead of fostering the “progress at any price” attitude that has dominated biomedical innovation until now. The economy cannot continue to cope with the rapid increase in health care expenditures, an increase that is fueled in large part by innovations produced in an environment that ignores cost. The problem is not just federal health care expenditures. State and local governments, hard-pressed to meet their obligations under Medicaid and other health care programs, are forced to cut back

support for education, repair of roads and bridges, and other critical expenditures. And the private sector is also under duress. A rapid increase in the cost of employment-based health insurance is the major reason why the wages of the average worker have been relatively stagnant for three decades. To understand the differences between the present environment for biomedical innovations and a value-conscious one requires thinking of three effects of every innovation: its effect on the quality of care (including reductions in mortality and morbidity rates, relief of pain, and improvement of other types of care that patients desire), its effect on the cost of care (the resources used to develop it and provide it to patients, relative to those used for current practice), and its effect on the value of care (changes in quality relative to changes in cost).

Until now, most biomedical innovations have been evaluated (if at all) only in terms of their effect on the quality of care. Cost is usually ignored, which means that value is ignored as well. There have been a few key innovations that increase quality of care and decrease the cost of care, resulting in unambiguously positive value; examples are antibiotics and diuretics. Most innovations, however, increase both quality of care and costs. Their effect on value depends on the relative sizes of these increases. In a value-conscious environment, some of the most popular innovations would meet a reasonable value standard, but many probably would not. An additional important result of a value-conscious environment would be the encouragement of innovations whose main effect is to substantially decrease cost while holding quality constant or reducing it only slightly. Such innovations are common in other industries but rare in medicine. If some of the resources devoted to marginal advances in the quality of care were reallocated to the development of innovations that reduced the cost of care, the problem of paying for high-value advances in quality for the entire population would be much easier to address. There is still need for health care reform that will slow the rate of growth of expenditures. Regardless of whether that reform involves a much larger role for government or is more market oriented, a shift in emphasis toward more value-conscious innovations is necessary and perhaps inevitable.

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## WORKSHOPS AND SEMINARS

- **Diagnostic ,Therapeutic Equipments and their application**



A workshop on Recent Advances on Diagnostic and Therapeutic Equipments and their applications was held in the department on 22<sup>nd</sup> and 23<sup>rd</sup> January 2013. Honorary speakers include Mr. Jagadeesh Kumar from Aries Biomed who gave a talk on Electrical Safety Standards in the design of equipments and Vineeth Gopal from Biopac who delivered a lecture on various recent medical equipments. Mohammed Yasin, Head of the Department, Biomedical Engineering, Rajalakshmi Engineering College spoke about the Gastric and Motility measurements using EGG and PPG. The entire workshop was coordinated by Mr. R. Sivarama Krishnan, Assistant Professor and the event saw 100 participants.

- **Skype presentation on Viscoelasticity of Tissues and Biofilms**

A lecture on Viscoelasticity of Tissues and Biofilms was given by Dr. Prashanth Sharma, University Medical Centre Groningen (UMCG). He briefed the students about the differences in viscoelastic properties of solids and fluids , measurement of viscoelastic properties. An example of lens from human and animal sources and microbial biofilms was taken to explain the topics in detail.



- **Product Development Workshop**

A seminar was taken by the HOD of Mechanical Department, Dr. V.E. Annamalai. The talk was basically on product design and development. He not only gave inspiring examples on modern day products but also methods that students could implement to do the same. He invited students to ask him questions and also welcomed them to get his help in their endeavours.



## ICBSII – 2013

### International Conference On Bio-Signals, Instrumentation and Imaging)

The department rallied its forces together to conduct a prestigious International conference on Bio-Signals, Instrumentation and Imaging. The conference was held over three days starting with a grand inaugural function on March 14<sup>th</sup> and ending with a bang on March 16<sup>th</sup>. It provided a platform for PG and Ph.D students to showcase their research findings and also paved the way for budding UG students to continue their journey on the highway of research and knowledge. The one unique aspect of this conference which projected it on a higher plane was the presence of key-note speeches by eminent speakers from the field and its auxiliaries.

#### Day 1-

The day started with the grand inauguration presided over by Dr. Emilio Gomez-Gonzalez, Director, Group of Inter-Disciplinary Physics, University Of Seville, Spain. The others present were Mr. Solaikutty Dhanapal, Academic Manager (Asia), National Instruments; Dr. S. Salivahanan, our Principal and Dr. A. Kavitha, Our beloved HOD. The inauguration was also marked by the donation of six Analog TI kits for our department by Mr. Prasanna Shankar, Manager, Trident Tech Labs, Chennai. The kits would be used in the setting up of an Analog Devices Laboratory in our department. The gathering was welcomed by our HOD which was followed by addresses by all the Chief Guests.

Dr. Emilio then presented a talk which gave us a beautifully breath-taking insight into the marriage of physics and medicine to give us better medical technologies in the diagnostic and therapeutic realms. He showcased some of the equipments designed in his



research den such as the HeadCam, etc. Then, it was the turn of Dr. Srinivasa Rajagopalan, Mayo Clinic, U.S.A to mesmerize the audience with his insightful and witty talk on “Applications of Computer Simulation in Surgery”. He presented his work on the use of computerized modeling and simulation of surgeries related to separation of conjoined twins and other complex cases.

The event then moved onto the presentation of the first set of papers (15) spread over 3 sessions. The papers illustrated new algorithms in eye-image segmentation and identification of micro-aneurysms.

### Day 2-

The day kicked off with the inspirational talk of Dr. Sushil Chandra, DRDO, New Delhi. He covered various aspects of cognitive ability enhancement studies in military and rehabilitation medicine. He also gave a good idea on the research capabilities of DRDO and ways for the student community to contribute to it. This was followed by presentation of papers related to Bio-signal processing which covered various issues ranging from fetal monitoring to driver-stress related alarms. The next session was marked by the talk of Dr. Vasudevan, Chennai on the history of Electro-encephalography and its domestic applications. This was followed by another round of paper presentation.

Post lunch, there was a trip to Mahabalipuram and the World Heritage Sites which the Chief Guest, staff and students enjoyed immensely. Dr.Emilio was awe-struck at the architectural wonders and took a lot of pictures as photography was one of his pastimes.

Later at night, there was a conference dinner at Hotel Sabari International which was a great platform for the students to interact with the distinguished guests in an informal manner. We had the opportunity to be up and personal with the guests. There was a small Cultural program before the dinner which showcased our country’s tradition and culture to the international guests. The guests enjoyed the show and the food that followed it. Dr. Sushil Chandra was so enthusiastic that he obliged to the students’ request to interact with him overnight at his guest house.

### Day 3-

Another slew of presentations were made on the final day that covered Instrumentation and image-masking concepts. The first session also included a talk by Dr. G. Kumaramanickavel, Professor Emeritus, Bengaluru on “Travelling in the highway of Genetics”. His talk took us on a heady journey on that highway and also answered many queries on genetic diseases and their treatment.



Post lunch, there was a talk on “Lasers in Ophthalmology” by Dr. B. Ganesh, Ophthalmologist, Ramachandra University. He gave us a doctor’s point of view on the cutting-edge technology and even gave us ideas related to the further development of the technology.

This was followed by the valedictory function which was presided by our HOD. The certificates were presented to the participants and 15 papers were short-listed for publication in the conference journal. The guest then talked about this wonderful experience and the conference ended with the vote of thanks proposed by Dr. V. Mahesh.

Thus ended the 3 days of high quality learning and proved to be a great swig of water to quench our thirst for knowledge.

**THE HINDU**  
TODAY'S PAPER » FEATURES » DOWN TOWN  
March 24, 2013

**42 papers presented**

The Department of Biomedical Engineering of SSN College of Engineering, Old Mahabalipuram Road, organised an international conference on “Biomedical Engineering and Instrumentation (ICBSI-2013)” recently.

As many as 42 papers, which include research works on artificial intelligence in biomedical engineering, biosensors, healthcare information system and computational neuroscience, were presented. Besides academic professionals, researchers and students, biomedical equipment manufacturers took part.

Emilio Gomez Gonzalez, Director, Group of Interdisciplinary Physics, University of Seville, Spain, inaugurated the conference. Kala Vijaykumar, president, SSN Institutions; S. Saivahanan, principal and A. Kavitha, head, Department of Biomedical Engineering, SSN College of Engineering; and Solanki Dhanabai, academic manager, National Instruments, were present.

Praveena Shankar, Regional Manager, Tricent Tech Labs, Chennai, in alliance with Texas Instruments India, provided six TI Analog Starter Kits for setting up the Analog Systems Lab for the department.

THE NEW  
**INDIAN EXPRESS**

International conference at SSN

Author: Express News Service

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The Department of Biomedical Engineering of SSN College of Engineering organised a three-day international Conference on Biomedical Engineering and Instrumentation (ICBSI-2013) at its campus on Old Mahabalipuram Road recently. The event witnessed presentation of about 42 papers by research scholars from all over the world. The papers included research works on Artificial Intelligence in Biomedical Engineering, Biosensors, Health Care Information System and Computational Neuroscience, among others. Over 120 participants including faculty, researchers, professionals, students and biomedical equipment manufacturers participated. The conference commenced with the inauguration by Emilio Gomez Gonzalez, Director, Group of Interdisciplinary Physics, University of Seville, Spain. Kala Vijaykumar, president of SSN Institutions, S Saivahanan, principal and A Kavitha, HOD - Biomedical Engineering, of SSN College of Engineering were also present.

Solanki Dhanabai, Academic Manager, and other dignitaries were also present at the programme that greatly benefited students.

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## FACULTY ACHIEVEMENTS



Dr. S. Pravin Kumar has presented the DST project proposal (under Cognitive Science Initiative scheme), entitled “Multimodal measurements and optimization of cognitive load with neurofeedback for enhanced learning and working skills” before the Task Force on Cognitive Science in its meeting at Indian National Science Academy (INSA), Bahadur Shah Zafar Marg, New Delhi-110002.



A guest lecture on "Electrical Nerve Stimulation and Biofeedback" was delivered by Dr. Bhuvaneshwari Rajendran, Consultant Physician and Neurophysiologist, Global Hospitals, Chennai. The lecture was arranged by Mr. R. Sivaramakrishnan, Asst. Professor, BME and students from third and final year were benefited from this talk.



Mr. Supraneni Krishan Mohan, Ph.D student public viva voce was held at Saveetha Medical college and he successfully completed his Ph.D degree under the guidance of **Dr. Mallika Jainu, AP/BME.**



Dr. Guruprakash attended one day COMSOL multiphysics education seminar held at Hotel Crescent Park, Nungambakkam.

Dr. Guruprakash gave an invited talk on "A changing paradigm: monofunctional to multifunctional biomaterial implants" at the Department of Mechanical Engineering, SSN College of Engineering.

# STUDENT ACTIVITIES

Jubilation, Frenzy and Madness. This is exactly what the Department of Biomedical Engineering has witnessed in the months of January, February and March 2013. The department has been buzzing with a lot of activities this New Year. Here is a peep into what made the headlines.

## INTER COLLEGE EVENTS

### Technical

Santhosh, Arun, Sanjay and Gunasekar of Third year participated in Technical Quiz conducted at KURUKSHETRA 2013, the techno management festival organized by College of Engineering Tech Forum.



About 25 students from second year have participated in the Bio Electronics Workshop conducted at IIT- M which was a part of their tech fest SHAASTRA 2k13 held on the fifth of January, 2013. The event had a number of elimination rounds. The participants who made it were:

- Finalist Divyalakshmi
- Hands on session (selected participants)  
Swathi, Aswin, Akshaya, Harini, Poongavanam and Anitha
- STREAX participants  
Dheepashri, Aishwariya, Gayathri

## VIGNYAN 2013



Srikanth.M, Sai Dayanandh.A, Sheshank.S from final year have bagged the first prize in Poster Contest in the VIGNYAN 2013 organized by Rajalakshmi Engineering College on March 1<sup>st</sup> 2013

The Students of Second year Divya.S, S Aishwariya, S.Swathi, S.Deepika, K Deepashri presented a poster on Calorie Burner and Diagnosis of vestibular disease in dogs using PET-CT at Rajalakshmi Engineering College.

## *Conference Publications*

**Akshaya C, D. Saranya Priyadharshini, S.Sowdhami, Dr.A.Kavitha and Dr. Alphin,** published an article , **‘Reconstruction of Osteoporotic Femur bone from CT Images’**, in the Proceedings of International Conference on Pattern Recognition Applications and Techniques, ISBN: 978-1-25-905849-3, 1-2 March 2013.



**Praveen Richard Ebenezer.C, Priyadharshini.B, Vishnu Priya.K, Dr.A.Kavitha, Dr. N.Venkateswaran** published an article, **‘Wavelet based image fusion scheme for Human Head modeling’**, in the Proceedings of International Conference on Pattern Recognition Applications and Techniques, ISBN: 978-1-25-905849-3, 1-2 March 2013

## **SSN CORNER**

Service to mankind is service to God, they say. The NSS unit of SSNCE follows it to the dot. At very regular intervals, they arrange for camps in different villages in Tamilnadu and the student volunteers actively offer their service for the development of those places. This time, about 20 students from the department attended the one week NSS camp at Eechangadu and were involved in the renovation of school buildings, conducting surveys and other social works.

### **SSN NSS**

Achudhan S.M and Sruthy.S from Final year have performed in the Choreo Nite at SAARANG 2K13, the cultural extravaganza of the Indian Institute of Technology, Madras on January 9<sup>th</sup> 2013.

### **EXTRA CURRICULAR**

Anjana Vencatesan from Final year took part in the SSN Speaker Contest 2k13 conducted by the English Literary Club on 26<sup>th</sup> and 27<sup>th</sup> February, 2013 which comprised of Group discussion, Debate and Extempore speech and she raised her voice till the finals round.

### **SSN SPEAKER CONTEST**

Fareesha and Sivisa from Final year participated in the MELA, which was held on 14<sup>th</sup> of February, 2013 as a part of the E-Week celebrations, organized by the Entrepreneurship Development Cell of the College. They sold yummy burgers and mouthwatering muffins and brownies.

### **THE MELA**



## **SPORTS CORNER**

- PremKumar from the third year, participated in the Sai Ram Trophy Volley Ball Tournament conducted by the Sri Sai Ram College of Engineering, West Tambaram, Chennai.
  - Archit Ramprasad from the third year, qualified till the Pre-Quarter finals in the Tamil Nadu Inter Engineering Sports Tournament.
  - Subash Raja from the Second year, reached the semi finals in the Basket ball tournament conducted by Sri Venkateshwara College of Engineering and also took part in the SA College Basketball Trophy.
  - Shruthi S from the third year, was a part of the winning team in the intra college Basket Ball match. She was a part of the main five at all three levels, the prelims, the semi finals and the finals. The event was held on the 28<sup>th</sup> of February.
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## INTERNSHIPS

Do you know the difference between education and experience? Education is when you read the fine print; experience is what you get when you don't.

-[Pete Seeger](#)

- ✓ Navathej.G, final year has been selected for an internship at National Instruments, Bangalore from January 22nd to March 28th to work on Ball on Plate System – an analysis on wear and tear of ligaments.



- ✓ Archit Ramprasad and Vignesh Baskaran, Third years will be doing their summer internship at IIT Madras in the Applied Mechanics Department.
- ✓ Vaishali has been shortlisted as a Summer Research fellow in the Indian Academy of Sciences, Bangalore. She will be working in Biomedical Signal/Image Processing at IISC, Bangalore.

85	ENGS744	Birla Institute of Technology & Science - Pilani, Rajasthan	Student	Gupta, Prof. Govind S. IISc, Bangalore
86	ENGS2432	<b>Gupta, Mr Parakh</b> National Institute of Technology, Tiruchirappalli	Student	Biswas, Prof. Gautam CMERI, Durgapur
87	ENGS278	<b>Gupta, Mr Saahil</b> National Institute of Technology, Karakshetra	Student	Jayachandra Shenoy, Dr U. IISc, Bangalore
88	ENGS6992	<b>Gupta, Ms Vaishali</b> SSN College of Engineering, Chennai	Student	Seelamantula, Dr Chandra Sekhar IISc, Bangalore
89	ENGS346	<b>Gurjar, Mr Suresh</b> National Institute of Technology, Rourkela	Student	Rathod, Dr Virendra K. IISc, Bangalore
90	ENGS2009	<b>Hardikar, Ms Mukta</b> National Institute of Technology - Karnataka, Mysore	Student	Rathod, Dr Virendra K. ICT, Mumbai

### *SOCIAL WORK*

Divya Bharathi, Lavanya, Sasikala and Shyamalee of Third year , as a part of Bhumi, an NGO conducted a Science exhibition and a workshop on storytelling and crafts for the children on 16<sup>th</sup> February and 30<sup>th</sup> March.



- Ashwin Varadarajan, Nidharshana R.G and Praveen Richard Ebenezer.C have passed the Common Admission Test,2012-2013 with flying colours.Ashwin scored an incredible percentile of 97.16.
- Six students have been placed in HCL Technologies Limited for the Medical Devices Business Unit.

## EDITORIAL TEAM

### CHIEF EDITOR

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