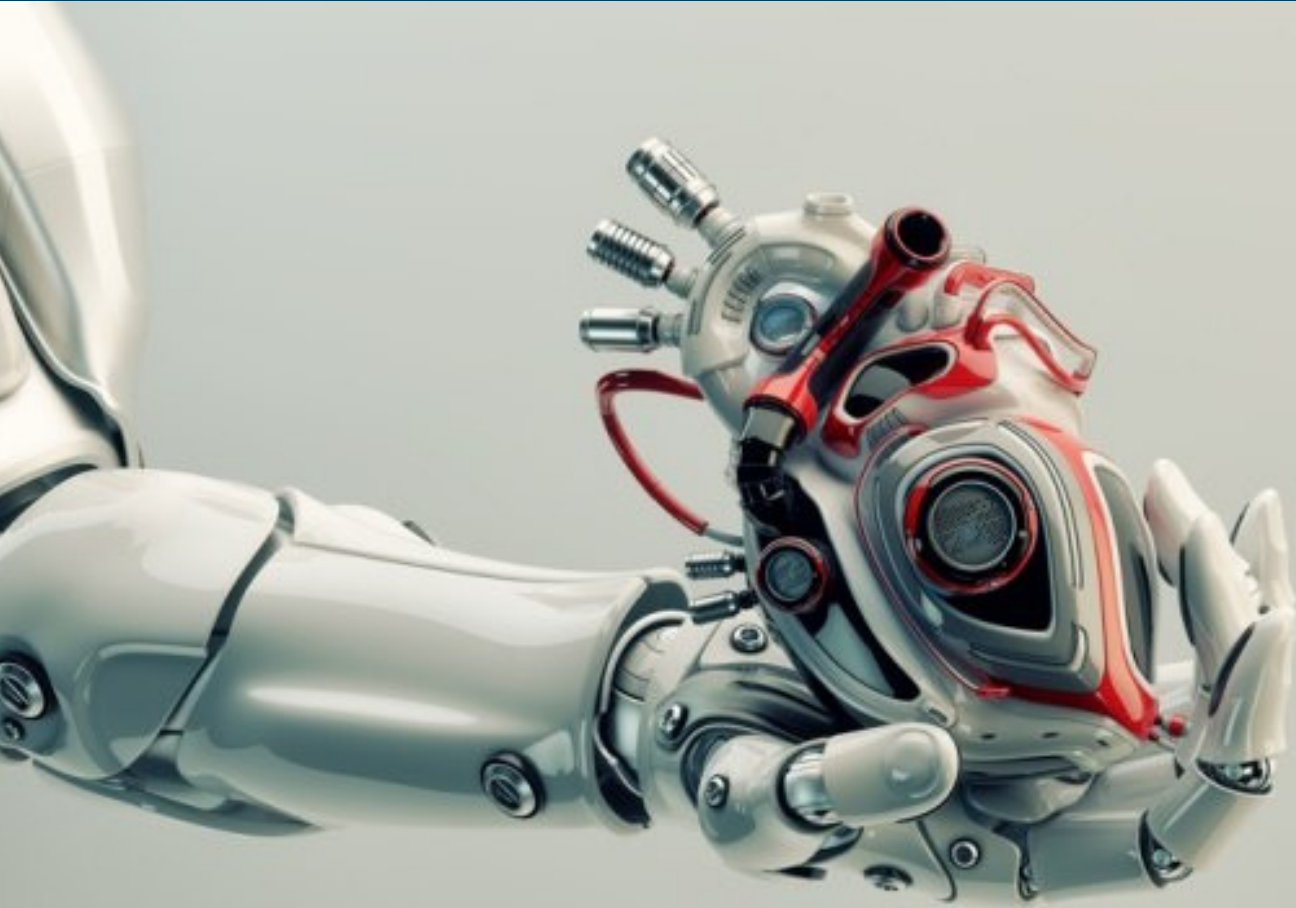


# DEPARTMENT OF BIOMEDICAL ENGINEERING



## SYNERGY

"LEAVE NOTHING TO CHANCE"



VOLUME 6  
ISSUE 4



DEPARTMENT OF BIOMEDICAL ENGINEERING

VOLUME 6 ISSUE 4

# SYNERGY



## FROM THE EDITOR'S DESK

"The past cannot be changed. The future is yet in your power".

A very happy and prosperous New year to everyone!

Covering the happenings in the department from the months of Oct – Dec 2017, this edition comes with the hope of being a motivator and giving people a reason to celebrate yet another set of accomplishments of the department. We've also included an intriguing article to take you into the astonishing world of BME.

Presenting to you SYNERGY, Volume 6 Issue 4.

### THIS ISSUE INCLUDES

---

**01** CAMPUS UPDATES

---

**02** DEPARTMENT UPDATES

---

**03** FACULTY AND STUDENT  
ACTIVITIES

---

**04** ARTICLES AND COMICS

*Editorial Team*

# FROM THE HOD'S DESK



**"Education is not the learning of facts, but the training of the mind to think".**

**- Albert Einstein**

It is heartening to write this foreword for our department's newsletter 'SYNERGY.'

Biomedical Engineering, as we know, is a multifaceted field and having a program that integrates academia with technology and its latest developments, is meritorious. We believe that our department plays a crucial role in designing the future of healthcare.

I wish all the students good luck in their future endeavors.

## EDITORIAL TEAM

### CHIEF EDITOR:

**Dr. A. KAVITHA, Prof. & Head, Department of BME**

### FACULTY EDITORS

**Dr. S. Arun Karthick, Asso. Prof/ BME**

**Ms. K. Nirmala, AP/ BME**

### STUDENT EDITORS

**Aparna B, III Year BME**

**Priyadarshini K, III Year BME**

# CAMPUS UPDATES

## DELEGATION VISIT

A Youth Delegation from South Korea (35 delegates) visited SSN College Of Engineering for Cultural Exchange Programme and interacted with our NSS Volunteers on 5th November, 2017.

This Programme was organized by the Ministry of Youth and Sports Affairs, Govt. of India and SSN was the only college selected for campus walk and interaction in South India.



**Ministry of Youth Affairs & Sports**  
Government of India



## FORBES LIST- ROSHNI NADAR MALHOTRA

The 2017 World's 100 Most Powerful Women identifies a new generation of icons, game-changers and gate crashers who are boldly scaling new heights and transforming the world. This year's ranking, the 14th edition, is nearly one-quarter newcomers who are stepping into power in politics, technology, business, philanthropy and media. Roshni Nadar Malhotra is a trustee of the Shiv Nadar Foundation and CEO of HCL Corporation. and she is ranked 57 in the Forbes list of Powerful Women 2017. She's an inspiration to all the women out there with big dreams and grit to achieve!





## CAMPUS UPDATES

### MOU WITH BIRMINGHAM UNIVERSITY

The MoU with Birmingham City University, which was initiated in the month of July was signed on 9th November 2017. This paves way for enhancement of the collaborative research activities between the two institutions and promotion of faculty and student exchange programme. The students can hence get a great exposure to the research activities going on in various fields of biomedical engineering and also opportunities to be a part of it.



### BREAST CANCER AWARENESS PROGRAM

A breast cancer awareness program was organized by the SSN- IEEE WIE student branch on 14th October 2017. The speaker of the event was Dr. Prema Jayaprasad, Sr. Consultant Obstetrician & Gynaecologist, Chettinad Super Speciality hospital. The main aim of the program was to bring awareness on breast cancer symptoms and signs and also to clarify that the presence of these symptoms and signs do not automatically mean that one has breast cancer. Cancer is one of the major causes of death in the world and awareness about it is the first step we can take to minimise it.






# DEPARTMENT UPDATES

## HINDU ARTICLE

The Hindu published an article on a research project on Prosthetic Limb carried out by the faculty and the students of Biomedical Department. **Dr. A. Kavitha**, Professor and Head/BME, and **Ms.R.Nithya**, AP/BME, along with their students have developed a Prosthetic Limb that will help amputees regain normal movement more readily. The project was funded by RECYCL3D, a Canadian social enterprise, to provide 3D-printed prosthetic limbs to those in need.

### A lightweight prosthetic hand that gives amputees a sense of grip

Engineering college students design remote-controlled, battery-operated limb which can function like a normal hand



**Helping hand:** Students of SSN College of Engineering, who developed a prosthetic limb using 3D printing technology, along with their coordinator A. Kavitha, left. **AK POHARAM**

**R. SUBATHRA CHENNAI**  
Four students of SSN College of Engineering have designed a prosthetic hand that could be almost as functional as a biological limb.

The prosthesis currently offered is basic where the fingers do not move laterally. Nor can the digits bend like normal fingers. The students have addressed this issue in their design.

"We visited some non-governmental organisations

that provide free prostheses to understand their requirement. They told us that people would like the limb to be functional; like a normal hand to pick up things," said A. Kavitha, head of Department of Biomedical Engineering, who is the faculty coordinator for the project.

They studied the various prostheses available abroad and using 3D printing technology, designed the hand. The remote-controlled, battery-operated limb is developed to enable lateral movement of the fingers. "The current prostheses are heavy and are unable to provide the desired degree of freedom. We decided to develop a lightweight prostheses," Ms. Kavitha said.

**Such advanced prostheses are available abroad but cost \$1,00,000**

**A. KAVITHA,**  
Head of Department of Biomedical Engineering

The students – R. Rathi Adarshi, A. Santhana Lakshmi and R. Shrutthi Sree – are in the final year of Biomedical Engineering. The fourth student Valshali Venkattraman has finished MR in Medical Electronics and is currently employed in a firm in Bengaluru.

The project received ₹10 lakh fund for material characterisation and design development and the patent for the design has been filed in Canada. "Such advanced

prostheses are available abroad but cost around \$1,00,000. We are trying to bring down the cost to \$1,000," Ms. Kavitha said.

The prosthesis has been made using recycled plastic and seven mini motors have been installed in the palm region allowing greater freedom of movement of the fingers. It weighs around 800 gm and is customised for international use.

The project was the result of a collaboration with Harb

aran Krithivasan, a former student of Ms. Kavitha and now the president of a company in Waterloo in Canada, which has also funded the project. "We are now involved in finding recycled plastic that can be used to manufacture the prosthetic limb," she said.

Ms. Kavitha believes this will lead to further improvement - an extension of the prosthetic limb that will be controlled by electromyographic signals.





# DEPARTMENT UPDATES

*The New Indian Express published an article commending the work of our department*

SSN College

Published: 05th December 2017

## Hand it to 'em: SSN students 3D print a super-light prosthetic 'hand' for amputees

Four students of the Biomedical Engineering department have created a prototype 'hand' that is more functional, lighter and cheaper than any other prosthetic on the market



The invention could revolutionise the industry making prosthetics accessible to all sections of society

There are more than one million amputations that occur every year - something like one every 30 seconds. The number of amputees is increasing but only a privileged few can afford prosthetic limbs. That's why the new 3D printed prosthetic limbs designed by the Biomedical Engineering department at SSN College, Chennai could be a gamechanger. Four students have designed a prosthetic hand that looks and feels like a prosthetic but is remote-controlled. Dr A Kavitha, Professor and Head, Department of Biomedical Engineering and R Nithya, Assistant Professor, Department of Biomedical Engineering at the SSN Institutions along with their students - Vaishalini Venkatraman, Rathi Adarshi R, Santhana Lakshmi A and Shuruthi Sree R, completed this project successfully.

Prosthetic Limbs that are currently in the market are extremely expensive, heavy and don't provide enough degree of freedom or movement. These 3D printed prosthetic limbs solve all these problems also making the device available for a hundredth of the cost. How? By using recycled plastic materials. A Canadian social enterprise called RECYCL3D collaborated with SSN to develop 3D printed prosthetic limbs with recycled materials. The device has already been receiving a lot of praise from the Research Advisory Council, universities across the world and many other organisations. "Our next project is to develop a prosthetic limb that can be moved through internal control mechanism," Kavitha said.

Because they will be using recyclable materials, the 'hand' will be environment-friendly and lighter in weight. Kavitha said that the current devices cost hundred times more than the new ones which could be priced between 65,000 rupees and one lakh rupees. The prosthetics can be designed depending on the requirements of every patient, Kavitha said. "The product has been designed and submitted for approval. It should hit the shelves in two months," she added.



# DEPARTMENT UPDATES

*The 'hand' touched yet another soul! DT NEXT also published an article highlighting the efforts of our department.*



HOME | NEWS | CITIZEN

CHENNAI | TAMIL NADU | NATION | WORLD | SPORTS | OPINION | BUSINESS | CITIZEN

## With foreign funding, SSN team creates affordable prosthetic limb

Published: Dec 12, 2017 07:00 AM

[Share](#) [Tweet](#) [Comments \(0\)](#)

[Mail](#) [Print](#)

[A](#) [A](#)

*A team of researchers at SSN institution has designed a new prosthetic limb that is cheaper and lighter than the alternatives currently available in the market.*



**Chennai:** According to Dr A Kavitha, Professor and Head, Department of Biomedical Engineering, there are more than 1 million limb amputations done annually, across the globe. "In our research, we found that people have to wait for years to get access to prosthetic limbs. This inspired us to work on a technology that will help. We have worked on a prototype and we will take six months to make it available for the public," she says. The team also comprises of R Nithya, Assistant Professor, three undergraduate and one postgraduate student.

The prosthetics available these days are heavy and do not allow the user to get the desired degree of freedom. "Our design is developed to provide a more functional artificial hand that would allow the patient to carry out important grasping patterns. The cost of this prosthesis will also be lower than the other products available in the market. The project was

initiated in 2016. Since then, a dedicated team of six people has worked towards realising this vision," she says, adding, "We will be using recycled plastic material. The designing of the product took us a year, but it's the characterisation of the material that has taken longer," she adds.

The project was funded by RECYCL3D, a Canadian social enterprise, to provide 3D-printed prosthetic limbs to those in need. The project has an outlay Rs 10 lakh.





# DEPARTMENT UPDATES

## ISO AUDIT MEET



ISO surveillance audit meet was held in the Department of BME on 16th October, 2017.





# DEPARTMENT UPDATES

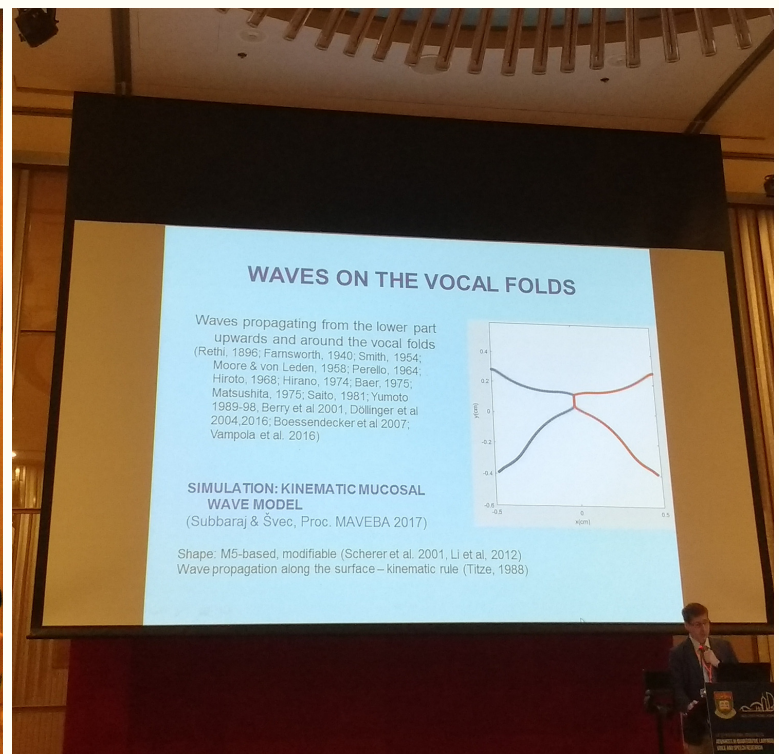
## FACULTY PARTICIPATION CONFERENCE

**Dr. Pravin Kumar Subbaraj** and team presented their work at the Advances in Quantitative Larynology, Voice and Speech Research (AQL) conference held in Hong Kong during 17th to 21st October 2017.

They presented their work on the topics

- 1. Fitting the Bezier curves for automatic VKG image quantification and
- 2. Model of mucosal wave motion on the vocal folds.

Both the presentations were very well received and appreciated by the voice research community.







# DEPARTMENT UPDATES

## FACULTY PARTICIPATION CONFERENCE

The following papers were presented at IEEE Region10 Conference (TENCON 2017), Penang, Malaysia:

**Nirmala K, AP/BME** Venkateswaran N, Vinoth Kumar C, "HoG Based Naive Bayes classifier for Glaucoma detection".

**Dhanalakshmi M, AP/BME** T.A. Mariya Celin, T. Nagarajan, P. Vijayalakshmi, "Electromagnetic Articulograph Sensor-To-Sound Unit Mapping-Based Intelligibility Assessment of Dysarthric Speech"



**Nirmala K, AP/BME at the IEEE Region10 Conference, Penanga, Malaysia**

Meenachi P, **R Subashini AP/BME** and Gnanaprakash D. "Antibacterial potency of Oregano oil to prevent bacterial adhesion", Proceedings of International conference on Biosciences, Bioinformatics (ICBB 2017), Page 120, Bharathiar University, Coimbatore.

Lavanya Krishnan, Chandramouli Ramesh, **Geethanjali B and Mahesh Veezhinathan**, "Prediction of musical perception using EEG and functional connectivity in the brain", FTC 2017 - Future Technologies Conference 2017, Vancouver, BC, Canada.

**Dr. J. Vijay, Asso. Prof/BME** participated in IEEE mini POCO conference at CEG, Anna University, Chennai organised by IEEE Madras section.



# DEPARTMENT UPDATES

## FACULTY PARTICIPATION STTP/FDP/TRAINING

**Dr. S. Arun Karthick, Asso.Prof/BME** participated in an AICTE Sponsored Short Term Course "Microfluidics Based Healthcare Diagnostics and Interfacial Phenomena", organized by Department of Mechanical Engineering, Indian Institute of Technology, Madras.

The main objective of the course was to motivate teachers and researchers to explore the interdisciplinary areas of microfluidics. In recent years, many prototype microfluidic devices and systems have been developed for health care and diagnosis. So the focus of the course was primarily directed towards biological sample preparation, disease diagnosis, and drug delivery using microfluidic devices along with practice sessions.

**Dr. L. Suganthi, Asso. Prof/BME** attended a Three Day Workshop on VLSI and Embedded System Design (VESD-2017), IIT Bhubaneswar, Odisha. It was a combination of lecture and hands-on practice on VLSI and Embedded based System Design tools for providing innovative system design aspects by addressing the key developmental challenges of Wearable Devices, Internet of Things (IoT), and Automation System.

**Dr. V. Mahesh, Asso.Prof/BME** attended 3 days Industrial Training/Visit at RMS India Pvt. Ltd., Chandigarh

Dr. V. Mahesh Asso.Prof/BME, at  
RMS India Pvt. Ltd., Chandigarh







# DEPARTMENT UPDATES

## FACULTY PARTICIPATION WORKSHOP

**Dr. R. Subashini AP/BME** participated in faculty development programme on 'Stem Cell Characterization and Advances in its Research and Applications' at Sri Venkateswara College of Engineering, Sriperumbudur.

The objective of this programme was to promote skills on the basics of stem cells, isolation, characterization and advanced potential applications in translational research and regenerative medicine. Hands on training on the aseptic culture technique of stem cells, isolation of stem cells from bone marrow, lineage specific differentiation of stem cells, characterization using advanced molecular biology techniques and bioprocessing of stem cells using WAVE bioreactor. As the part of the programme, an Industrial visit and interaction has been arranged to Life Cell International Pvt Ltd, Chennai on 7th Dec 2017.



**Dr. R. Subashini AP/BME at Sri Venkateswara College Of Engineering**



# DEPARTMENT UPDATES

## FACULTY PARTICIPATION GUEST TALK

**Dr. S. Bagyaraj Asso.Prof/BME** delivered an expert talk on “Communicating Brain Computer Interface through IoT” in the ICMR sponsored two day seminar on IoT enabled Healthcare Technologies for India at KCG College of Technology, Karapakkam.

**Dr. V. Mahesh Asso.Prof/BME**, delivered a Guest Talk on "Design and Development of a Telemedicine system for rural healthcare", at AICTE sponsored seminar on “Healthcare with WBAN and its challenges” held at Department of ECE, SSN College of Engineering.

## SYLLABUS SUB COMMITTEE MEETING

**Dr. A. Kavitha Prof&Head/BME and Dr. V. Mahesh Asso.Prof/BME** attended syllabus sub-committee meeting at Anna University, Chennai and actively participated in framing R2017 syllabus for U.G Biomedical Engg. & Medical Electronics.

## PATENT COMMITTEE MEETING

**Mrs. M. Dhanalakshmi AP/BME** had attended Patent committee meeting held at Admin conference hall, along with her students Mr. S. Viswanath and Mr. G. Praveen Kumar (III year BME). The students presented the project titled “An external aid for Amyotrophic Lateral Sclerosis patients” before the committee members. Dr. A. Kavitha Prof & Head/BME and Dr. J. Vijay Asso.Prof/BME were the experts from Biomedical department in the Patent Committee.





# DEPARTMENT UPDATES

## FACULTY PARTICIPATION - RESEARCH ACTIVITIES

### JOURNAL PUBLICATION

Sumathy K., **Maresh Veezhinathan, Asso. Prof/BME** and Jesu Christopher "Analysis of Carotid Ultrasound Images for the assessment of stroke risk using level set method", Current Medical Imaging Reviews, Vol. 13, PP. 237-244, DOI : 10.2174/1573405612666161021164450.

### EXTERNAL PROPOSAL SUBMITTED

**Dr.B.Geethanjali, AP/BME** and **Dr.V.Mahesh, Asso. Prof/BME** submitted a proposal on "Visualising the Functional Connectivity of Brain Cognition on Young Learners through Simplified Kundalini Yoga (SKY) based on Computational Neuro Physiological Models" to Science and Technology of Yoga and Meditation. The proposal was submitted for an amount of Rs.67, 70,000 Lakhs.

### OTHER ACTIVITIES

**Dr.B.Geethanjali Asst.Prof/BME** has been recognized as a Supervisor (Ref .No: 3040054) for guiding Ph.D. and M.S. (By Research) scholars of Anna University under the faculty of Information and Communication Engineering

**Dr. V. Mahesh Asso.Prof/BME** has attended DC meeting for Ms. B. Sumathy at SNS college of Technology, Coimbatore



# DEPARTMENT UPDATES

## FACULTY PARTICIPATION - RESEARCH ACTIVITIES

### TECHNICAL REVIEWER

**Dr. J. Vijay, Asso. Prof/BME** has been invited as technical reviewer for reviewing the papers submitted for International conference on Recent Advances in engineering and Technologies (ICRAET 2017) technically sponsored by IEEE and organised by Sri krishna College of Engineering, coimbatore.

**Dr. J. Vijay Asso.Prof/BME** has reviewed a manuscript titled "Exploring Early Adopter Baby Boomers' Approach to managing their Health and Healthcare" which was submitted to International Journal of E-Health and Medical Communications

**Dr. J. Vijay Asso.Prof/BME** has reviewed a manuscript titled "ACTION OF ELANEER KULAMBU ON PRESBYOPIA" which was submitted to International Journal of Public Health and Epidemiology Research





# DEPARTMENT UPDATES

## FACULTY -INTERNAL FUNDING

**Dr. L. Suganthi Asso. Prof** was sanctioned Rs.2.30 Lakh for the project titled "Design of FPGA based non-invasive glucometer using Infrared LED techniques towards continuous glucose monitoring" by SSNCE for the period of 1.5 years.

### Project Summary:

According to the International Federation of Diabetes, 415 million adults around the world are suffering from diabetes, and it is estimated that the numbers will reach around 642 million by 2040. The availability of home-use glucometers has greatly improved the quality of life of an individual suffering from diabetes. For optimum insulin dosage, it requires continuous/ frequent monitoring of blood glucose. But currently available glucometers do not address this requirement. One of the existing continuous monitors one that need to be implanted under the skin which causes trauma while implanting. Moreover, they need to be replaced every week. The advent of a pain free noninvasive technology would improve the patient's compliance for regular blood glucose monitoring.

The newest way to monitor blood glucose levels is with a continuous glucose monitoring (CGM) device. This proposal aims to design a Non-invasive Blood Glucose measuring device using Photo plethysmography (PPG) in the near infra-red range. A predictive model to estimate the blood glucose levels based on characteristics of the output of the detector has been implemented using Field-Programmable Gate Array (FPGA). The proposed device is wearable in wrist which can display the variations in glucose value continuously.



# DEPARTMENT UPDATES

## FACULTY - INTERNAL FUNDING

**Dr. S. Bagyaraj Asso.Prof** was sanctioned Rs.3.11 Lakh for the project titled "Development of an integrated continuous wave near infrared spectroscopy and surface electromyography system for studying the muscles during different activities" by SSNCE for the period of 2 years.

### Project Summary:

The aim of this proposal is to design and develop an integrated Continuous Wave Near Infrared Spectroscopy (CWNIRS) and Surface Electromyography (sEMG) System. The purpose of the device development is to investigate the correlations between sEMG and CWNIRS signal parameters in detail.

The objective of the proposed system is to investigate the relationship between the electrophysiological and local tissue oxygenation parameters, in depth, for different exercise and rest. A parametric analysis can be performed on each signal, and then correlations between the sEMG and CWNIRS parameters will be done. If this system is developed it will fulfill the clinical practical requirements of neurologist to investigate muscle.



# DEPARTMENT UPDATES

## STUDENT INTERNAL FUNDING

Project review for Internally funded projects was held at the incubation center where students from 2nd, 3rd and 4th year presented their ideas.

The students who gave their presentation are :

NAME AND YEAR OF THE STUDENTS	PROJECT GUIDE	PROJECT TITLE
G. Praveen Kumar (III Year) R. Asha (III Year) B. Sangeetha (III Year) S. Om Prakash (III Year)	Dr. L. Suganthi Ms. B. Divya	Six-lead EGG procurement belt for gastric oddities
R. Viswath Narayanan (III Year) D. Yaamini (III Year)	Dr. A. Kavitha (BME) Ms. S. Vidhusha (IT)	Development of VR environment for autistic children
S. Viswanath (III Year) S. Apurva (III Year)	Dr. R. Subashini	Orthopedic belt using sodium acetate crystals
V.K. Kavya (II Year) Suhashine Sukumar (II Year) Vignesh Rudran (II Year)	Dr. S. Bagyaraj	Jugular venous pressure measuring device





# DEPARTMENT UPDATES

## STUDENT INTERNAL FUNDING

NAME AND YEAR OF THE STUDENTS	PROJECT GUIDE	PROJECT TITLE
R. Abarna (III Year) M. Kirthana (III Year)	Ms. M. Dhanalakshmi	Ultrasonic belt with voice playback for visually challenged
R.P. Subramanian (II Year) R. Yohanya (II Year) S. Sathis Kumar (II Year)	Dr. S. ArunKarthick	Biocompatibility of astaxanthin on the structural, optical, antimicrobial and anticancer properties of ZnO and CeO2 nanoparticles prepared by green method
S. Ishaa Samyuktha (II Year) T. Akshara Reddy (II Year)	Dr. R. Subashini Ms. K. Nirmala	An automated pre transfusion test based on image processing
K. Arun Kumar (III Year) P.G. Pavithran (III Year)	Dr. S. Bagyaraj	Development and testing of command prompt assist device for locked in syndrome patients
KK.R. Anjana (III Year) K. Anuharshini (III Year) M. Sivaranjani (III Year) M. Sowmiya (III Year)	Dr. J. Vijay	An indigenous pulse diagnosis system for siddha medicine



# ALUMNI UPDATES

## FROM SSN TO TU DRESDEN, A MEMORABLE JOURNEY

*An article by Saravana Prakash Shanmugasundaram, alumnus of BME*



ONE YEAR OF MASTER'S JOURNEY



Happy greetings to all my juniors!

I am really happy to write this article about my master's journey.

..... It all began from the insisting words of Dr. S. Pravin Kumar, when I had a dilemma trying to decide whether to go for placements or apply for my dream masters. He suggested me to apply for masters and I had no clue about whom to ask and where to apply. Financial constraints of my family made it even more difficult to even dream about masters abroad.

I didn't change my decision of doing masters for the sake of the situation and started to search about Universities which offer full scholarship courses with zero tuition fees and partial fees from the students. It thereby drove me to the continent of Europe, especially towards Germany. And here I am, now pursuing my Masters in Nano-electronic systems in the Technical University of Dresden, Deutschland.

Right from the first day, my financial crisis made me think of how to manage my funds abroad. I found out options for doing Research assistantship where one can work with a group of scientists and they pay you for your basic needs. I've completed a year now with a wonderful research team in Leibniz institute for Polymer Research

Dresden (Team members in the picture above). Within this one year of work we got the group research funding of 1 million euros under my supervisor's name.

With this experience I applied for the prestigious "Deutschland stipendium" award, through which a student can manage his one year living expenses in Dresden. With everyone's support I got a sanction for one year funding from DAAD organization. I am very much elated to be the only student from the department getting it. The key factor is that the student is eligible to collaborate with all the research institutions in the Saxony state based on his interest. This drives me to work in a more sensible way and make maximum use of it.



Picture taken during the Prestigious Deutschland stipendium award function along with fellowship holders and the Chancellor of TU Dresden Prof. Hans MuellerSteinhagen at the right end.

The above stated are some highlight events of my Master's journey and I will be in touch

with all my juniors through "Mentorship for abroad studies". There will be periodic sessions with students regarding their queries and guiding them towards the application of full scholarship masters application in the upcoming weeks. I will be really happy if one of my juniors could get into these kind of places. Let us attempt for successful admissions.

My first year masters is equal to my four years of Bachelors in SSN BME. Our department has shaped me into a better person. Things I learnt from SSN cannot be expressed merely through words. Each and every day was a learning experience for me. If you have crazy ideas please work on it and I am sure SSN will recognize it through internal fund and other moral support. I would say "To a student SSN is another parent who can teach, support and shape". My sincere thanks to all the support you gave me at SSN.

"Please make use of the roads paved by SSN to reach your destination".

With sincere regards,

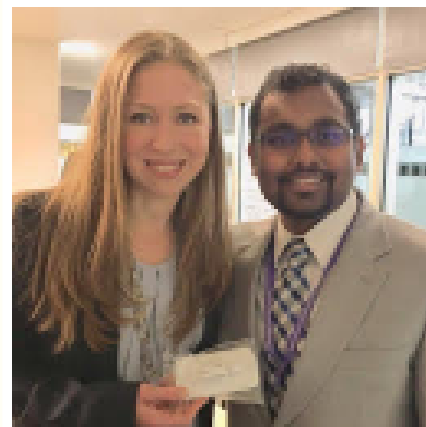
**Saravana Prakash Shanmugasundaram.**  
saravanaprakash12040@bme.ssn.edu.in  
saravanaprakash54@gmail.com



# ALUMNI UPDATES

## ALUMNI OF BME 2011 BATCH RECEIVES FDA CLEARANCE FOR HIS PRODUCT

**One of our department's alumni, Mr. Sivakumar Palaniswamy is now the co-founder of NeoLight, a start up whose motto is "Empathy driven Innovation".**



Pic with Chelsea Clinton @ CGIU

NeoLight focuses on re-inventing healthcare for the new-born by designing safe and smart medical devices for their treatment. One such project that they have been working on is the Skylife portable phototherapy system. The device is intended for the treatment of neonatal unconjugated hyperbilirubinemia, commonly called as jaundice.

Infant jaundice is a condition where a baby's blood contains an excess of bilirubin, a pigment of red blood cells. It is widely seen in babies born before 38 weeks gestation (preterm babies). Jaundice in the newborn must be carefully monitored, as although complications are rare, a high bilirubin level associated with severe infant jaundice or inadequately treated jaundice may cause brain damage. The Skylife device treats jaundice by delivering a narrow band of high intensity blue light to the affected new-borns via blue LEDs. On 30th October 2017, Neolight announced that it has received a 510k clearance from the U.S FDA to market the Skylife device. Mr. Sivakumar is very much elated to share the news and extends his gratitude to BME's faculty and the department's contribution to NeoLight. He says one of the major reasons he was able to overcome all the hurdles during the process was the department's constant support and motivation. He sure is an inspiration to all his juniors who aspire to become entrepreneurs.

“To accomplish great things we must not only act, but also dream; not only plan, but also believe”. Our heartiest congratulations on your achievement!



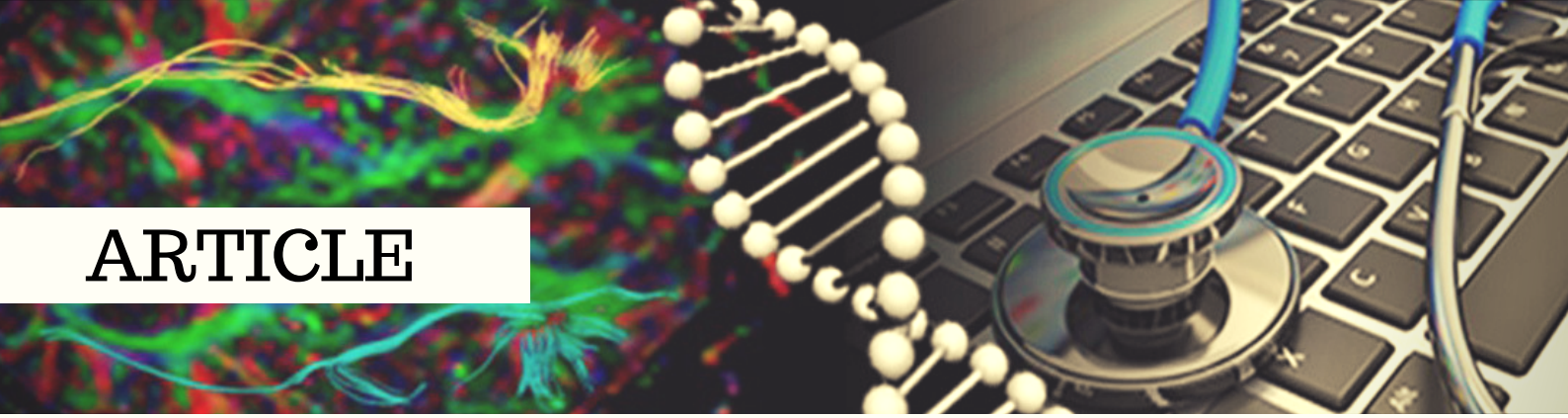
## GENE MUTATION CAUSES LOW SENSITIVITY TO PAIN



A UCL-led research team has identified a rare mutation that causes one family to have unusually low sensitivity to pain. The researchers hope the findings, published today in *Brain*, could be used to identify new treatments for chronic pain. They studied an Italian family, the Marsilis, which includes six people who have a distinctive pain response that has not been identified in any other people.

“The members of this family can burn themselves or experience pain-free bone fractures without feeling any pain. But they have a normal intraepidermal nerve fibre density, which means their nerves are all there, they’re just not working how they should be. We’re working to gain a better understanding of exactly why they don’t feel much pain, to see if that could help us find new pain relief treatments,” said the study’s lead author, Dr James Cox (UCL Wolfson Institute for Biomedical Research). One in ten people experience moderately to severely disabling chronic pain,\* but treatments beyond common painkillers remain elusive. Understanding the causes of congenital analgesia, a rare inherited condition that reduces the capacity to feel physical pain, is one of the main areas of research that could lead to new pain relief therapies.

Two other mutations causing congenital analgesia are being actively explored by researchers alongside pharmaceutical firms, but have yet to yield any breakthrough drugs.



# ARTICLE

The research team added to previous work with the Italian family to clarify the nature of their phenotype (the observable characteristics caused by their genetics) – named the Marsili syndrome after their surname – finding that they're hyposensitive to noxious heat, hyposensitive to capsaicin (in chilli peppers) and have experienced pain-free bone fractures.

Using DNA from blood samples, the researchers conducted a whole exome sequencing – mapping out the protein-coding genes in the genome of each family member. They identified a novel point mutation in the ZFHX2 gene. The mutation alters a part of the gene's protein sequence that is normally consistent across species as variable as mice and frogs.

The researchers then conducted two animal studies to understand how the gene affects pain sensations in mice. They initially used mice that had been bred with the ZFHX2 gene entirely absent, and found them to have altered pain thresholds. They then bred a new line of mice that had the relevant mutation, and those mice were notably insensitive to high temperatures. Further analysis of the mice bearing the mutation clarified that the gene regulates a number of other genes that have previously-established connections to pain signalling.

The study was funded by the Medical Research Council, Wellcome, and Arthritis Research UK, alongside support from Shionogi, the Alzheimer's Society, Colciencias and the University of Siena.





## ARTICLE

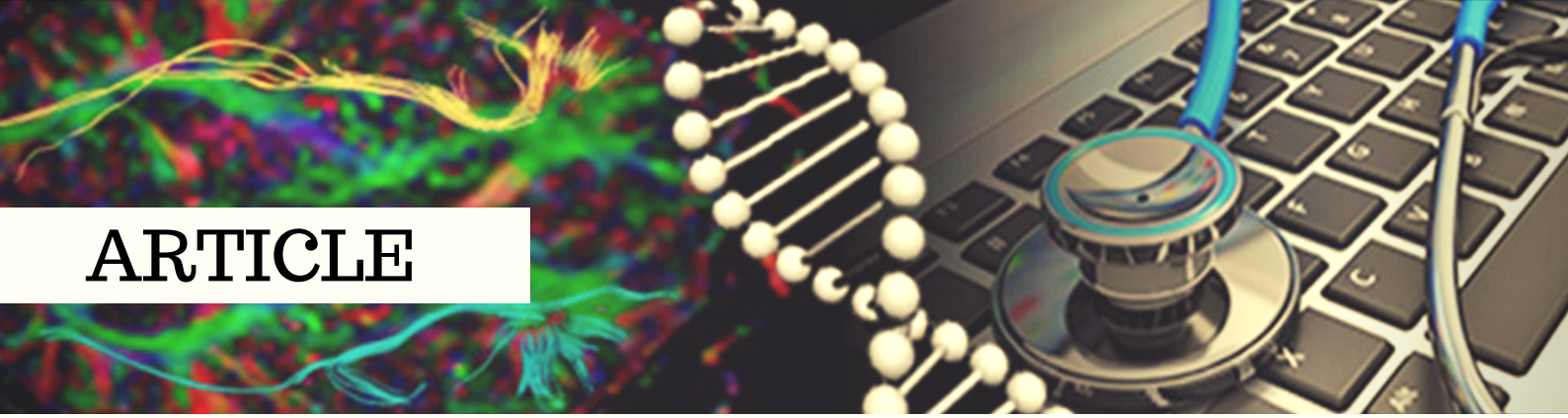
# IT MIGHT BE POSSIBLE TO REMODEL A BABY'S MICROBIOME!



The microbiome—the collection of bacteria and other microbes that reside in our bodies and on our skin—has huge potential. Over the past decade or so, we've found that our microbial makeup influences everything from acne to food allergies, obesity, and digestive diseases. But so far, there hasn't been much research on exactly what strains of bacteria do what, and how much of an influence these microbes can have on us. Are they the determining factor in the development of some diseases, or just a minor player? Even if we figure all these things out, scientists still haven't found a way to keep the bacteria alive in our guts without continuing to administer them in the form of a pill.

In a study out this week in the journal *mSphere*, scientists showed that when they gave breastfeeding infants a certain strain of bacteria (commonly found in babies' guts) for almost a month, those newborns were able to keep the bacteria strain alive for months afterward.

Baby microbiomes are extremely important. Our bacterial diversity is at its most vulnerable during this stage. The microbial colonies that take hold during our first few months and years set the tone for the rest of our lives.



## ARTICLE

Gut microbes are highly dependent on diet, and that depends on a multitude of factors (culture, location, and personal preference, to name just a few). Even diets high in fruits and vegetables will create microbiomes that reflect the type of produce and veggies eaten. There might be no such thing as a "normal" microbiome. Even if scientists can figure out how to hack a human's gut microbes to replace the flora with something healthier, it's unlikely to be administered as a single, on-size-fits-all therapy. Certain guts may simply need certain bugs.

But according to study author Mark Underwood, a neonatologist at the University of California, Davis' medical center, many scientists agree that high numbers of Proteobacteria (a big group including both beneficial species and strains that can cause disease, like E. Coli and Salmonella) put babies at risk for allergies and other types of autoimmune diseases, as well as obesity and diabetes. But high and diverse numbers of commensal bacteria, ones that are found in most adult guts, can lead to better growth, and even better responses to vaccines.

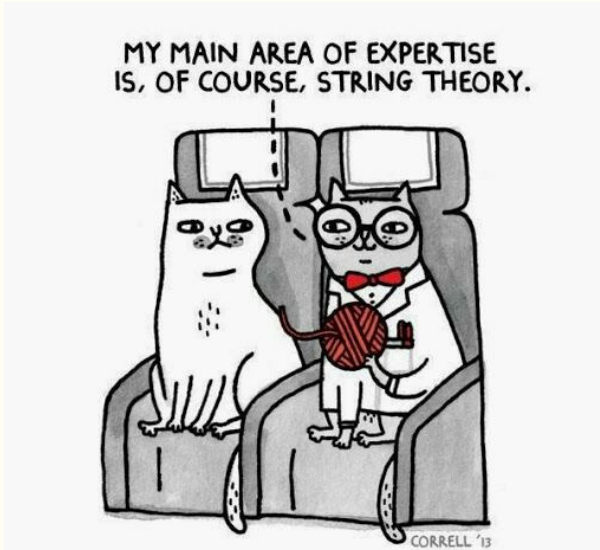
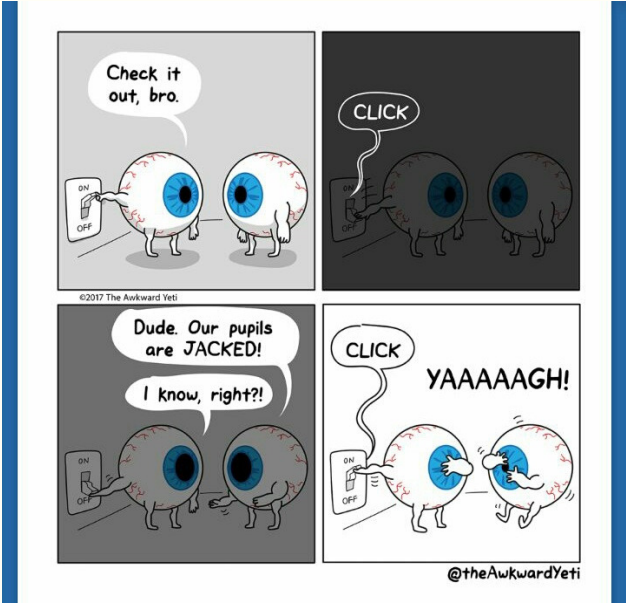
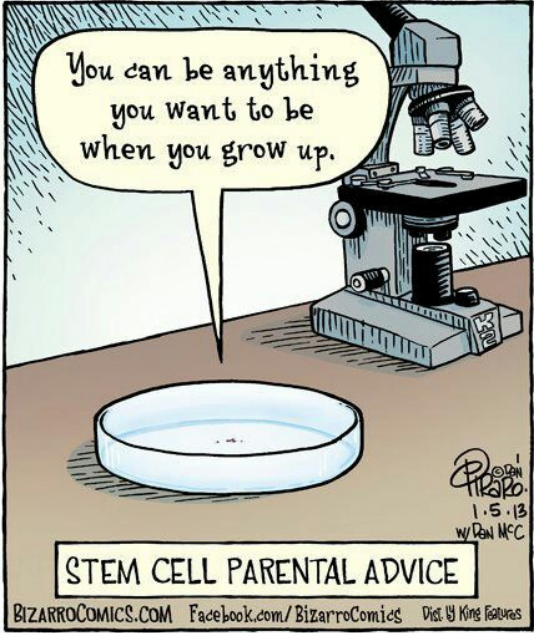
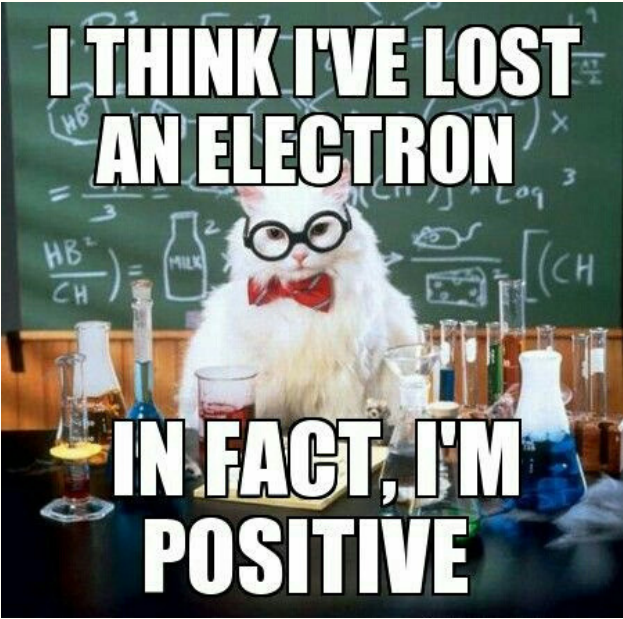
How much of an influence do changes in baby gut bacteria have on our potential to develop disease? He hypothesizes that tweaks made to the microbiome could have a long-term impact on the immune system, potentially for decades. But to know for certain, Underwood would have to follow those kids (as well as subjects who didn't get the probiotic treatment) throughout their lives, and observe what diseases, if any, they develop.

Scientists will also need to do more of these long-term comparative studies to truly understand what constitutes a healthy or unhealthy microbiome, and how much being born via cesarean section or being formula fed can actually influence our gut flora. Further, if the ultimate goal is to use bacteria as a sort of medicine, they need to remain in the gut for a significant period of time, perhaps indefinitely. This study suggests that babies might have microbiomes that are prime for reseeded, but the adult gut will no doubt be even more difficult to cultivate.





# IT'S COMIC TIME!





# UPCOMING EVENTS

## FOR REGISTRATIONS

Go to [sites.google.com/view/biomechanics-ssn/](https://sites.google.com/view/biomechanics-ssn/) (or)  
Contact the Coordinators

## TARGET PARTICIPANTS

Engineers from R&D Organisations,  
Engineering Service Provided  
(IT/ Non-IT), Medical Professionals,  
faculty members/ students from Educational  
Institutions and research scholars

## COURSE FEE

**Student /  
Research Scholar**  
₹ 3000 / 100 \$

**Faculty**  
₹ 4000 / 150 \$

**Industry/ R&D**  
₹ 6000 / 200 \$

Fee includes Bench fee to be paid to Drexel University & National Technological University Singapore, Lunch, Tea, Resource Material, Transport by College bus, 20 % Concession for more than one participants from the same organisation. Number of Participants is limited to 35.

These course are highly subsidised by the SSN College of Engineering as a goodwill gesture to the Industries, Educational Institutions and R&D Organisations.

## CONVENER

**Dr. A Kavitha**  
Professor and Head,  
Dept. of Biomedical Engineering

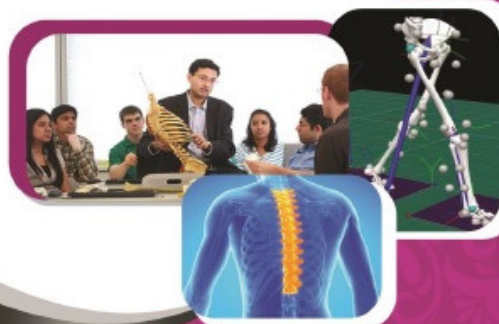
## CO ORDINATORS

**Dr. M S Alphin**  
Associate Professor,  
Dept. of Mechanical Engineering  
Mobile: 7010416207  
E mail: alphinms@ssn.edu.in

**Dr. S Bagyaraj**  
Associate professor,  
Dept. of Bio Medical Engineering

## 3-Day Short Course on BIOMECHANICS

**SSN**



Offered by Experts from :

Drexel University, USA and Nanyang Technological University, Singapore

Jointly Organised by :

Department of Biomedical & Mechanical Engineering,  
SSN College of Engineering

DATE : 19 - 21 March 2018

VENUE : SSN College of Engineering, Chennai, India

## OBJECTIVE OF THE COURSE

- To impart knowledge on the various insights of pediatric biomechanics, clinical biomechanics, musculoskeletal biomechanics, gait and posture and sports biomechanics.
- To create awareness among researchers and faculty members to engage in the development of product based experimentation on biomechanics.
- To explore the best ways to translate biomechanics research to enterprise and clinical stakeholders.
- Global exposure through experts from Drexel University, USA and NTU, Singapore.
- The participants should gain an understanding of the mechanical and anatomical principles that govern human motion and develop the ability to link the structure of the human body with its function from a mechanical perspective. At the completion of this course it is desired that each delegate be able to: 1) describe motion with precise, well-defined mechanical and anatomical terminology; 2) understand and quantify linear and angular characteristics of motion; 3) understand the quantitative relationships between angular and linear motion characteristics of a rotating body; and 4) understand and quantify the cause and effect relationship between force and linear and angular motion.

## ABOUT THE RESOURCE PERSONS

### Dr. Srinam Balasubramaniam, Ph.D

Dr. Srinam Balasubramaniam is an associate Professor in School of Biomedical Engineering, Science and Health Systems at Drexel University, USA. His research is focused on developing novel biomedical engineering methods and advanced computational modeling tools to address the burden of debilitating pediatric skeletal deformities, traumatic injuries and orthopedic conditions. He specializes in characterizing the morphology and growth patterns of the normative and scoliotic pediatric spine and rib cage, rapidly creating patient-specific computational models to simulate surgical interventions, and developing age-equivalent animal models for scoliosis and pediatric long bones. His research expertise also includes experimental biomechanics in the areas of pediatric head and neck injury, orthopedic biomechanics of the knee, thorax and spine, and knee biomechanics following ligament reconstructions. He has mentored several graduate, undergraduate and high school students in his lab, and has received the 'Outstanding STAR (Students Tackling Advanced Research) Mentor Faculty Award' for 2010 - 2011.



### Dr. Kong Pui Wah

Dr. Veni Kong graduated from the Department of Sports Science and Physical Education at the Chinese University of Hong Kong in 2000, obtained her MSc in Sports Science from Loughborough University (UK), followed by a PhD in Sports Biomechanics. She started her career as an Assistant Professor in the Department of Kinesiology at the University of Texas at El Paso and was a visiting faculty member at the Emergency Responder Human Performance Laboratory, University of Pittsburgh School of Medicine for one year prior to joining the National Institute of Education, Nanyang Technological University, Singapore in July 2009.

Dr. Kong's research interests include sports and clinical biomechanics. She has led projects on footwear and gait analysis on athletes, firefighters and older adults. She also worked closely with hospitals and healthcare professionals to address clinical problems such as foot health and low back pain management. Her research on computer simulation models of springboard diving has received international awards including those from the International Sports Engineering Association and British Association of Sport and Exercise Sciences.



### Dr. Teo Ee Chon

Prof Teo is an associate professor in the School of Mechanical & Aerospace Engineering at Nanyang Technological University since 1992. He received his Bachelor degree in Mechanical Engineering from University of Nottingham, UK, Master and Ph.D. degrees from the University of Nottingham and Strathclyde University, UK, respectively. His research interests include static and dynamic analysis of engineering and human skeletal structures. He has done significant research work in research areas and published over 50 top quality international conference and journal papers. He is an Editorial Board member of Medical Engineering & Physics, and has been often invited as a referee and reviewer for a number of grant applications, premier conferences and journals, including Spine, Biomechanics, etc. Dr. Teo is a member of PE Board and IES, Singapore.



**Dr. G. Sudhir**  
M.B.B.S., M.D. (Ortho),  
FNB (Spine Surgery)

**Dr. Varadhan S.K.M.**  
Neuromechanics Lab, IT Madras India

**Mr. K. Mohanavelu**  
Scientist & Head, Biomedical Technology,  
DRDL, DRDO, Bangalore

**Dr. Ramesh Pudale**  
BFG Account Manager at Autodesk  
Mathematical Design Support, Veterinary, Parasitic Technology

**Dr. Dinesh Bhatia**  
Associate Professor and Head,  
Department of Biomedical Engineering,  
North Eastern Hill University

## About SSN College of Engineering

[www.ssn.edu.in](http://www.ssn.edu.in)

SSN Institutions, founded by Padma Bushan Dr. Shiv Nadar, Chairman, HCL Technologies, stands out as a premier center of higher learning with a mission of pursuing excellence in education and research. The institutions, with their diverse and dynamic community of students offer a distinctive combination of some of the finest graduate, undergraduate and research programs, accomplished faculty, world class facilities and a residential campus set on a sprawling 250 acres of sylvan surroundings. SSN Institutions provide a variety of stimulating environments for intellectual development, free thinking, and personal growth, challenging its students with dynamic learning opportunities and equipping them with the skills, insights, attitudes and practical experiences that are necessary to take up responsibilities in the society.

NIRF Rankings: SSN secured the all India 27th rank in the engineering category in the NIRF ranking system constituted by the ministry of HRD. SSN College of Engineering was also accredited by NAAC with an A+ Grade in 2017

## ABOUT DEPARTMENT OF BIOMEDICAL ENGINEERING

The department of Biomedical Engineering was started in the year 2005 offering B.E Biomedical Engineering and M.E. Medical Electronics, since 2014. The UG program is accredited by NBA, New Delhi for five years in 2015. The department has been recognized as a research centre by Anna University in 2011 for pursuing M.S (By Research) and Ph.D. programme. The department has 16 faculty members with 10 Ph.D. holders out of which 8 are recognized Ph.D. supervisors. The department has well-equipped, laboratories including the Biomedical Instrumentation lab, Microbiology and Biochemistry lab, Diagnostic and Therapeutic lab, Medical Software lab to meet the requirements of Anna University to the fullest and to enable the students and the scholars to pursue research in-house. State-of-the-art instrument in the department are EEG- wired and wireless, 3D Printer, and BIOPAC/MIMICS SOFTWARE.

The department coordinates CENTRE FOR HEALTHCARE TECHNOLOGIES - A multidisciplinary research initiative, which carries out world class research activities in the field of neuroscience, medical signal and image processing, medical instrumentation and bioengineering. Highlights of the department include industry-institute interactions with eminent healthcare organisations like Neolight USA, Wild Box Technologies Singapore, NIEPMD, Philips, Siemens, National Instruments, Texas Instruments, and Signed MoUs with Drexel University USA, Birmingham City University UK. Several consultancy projects in biomechanics, biomaterials and artificial organs have been carried out for National and overseas clients.

## ABOUT DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Mechanical Engineering was established in the year 2007. It offers a U.G program in B.E. Mechanical Engineering and P.G. programmes in M.E. Manufacturing Engineering and M.E. Energy Engineering. The department is also recognized as nodal research center for M.S (By Research) and Ph.D. under Anna University, Chennai for pursuing their doctoral research works.

The Department has got 34 well qualified and experienced faculty members out of which 29 Ph.D. degree holders and the remaining 5 are verge of completing Ph.D. degree. The department has 29 recognized Ph.D. supervisors and 103 Ph.D. Research scholars under Anna University Chennai, out of which 19 full-time scholars and 84 part-time scholars.

The faculty members and students actively engage in research and constantly publish papers in reputed International Journals. The Department regularly organizes National and International conferences and workshops in emerging areas. The department also have Industry Institute Partnership Cell (IIPC) for enhancing the relationship between the institute and industry.

The major research areas are : Friction Stir Welding, Metal Cutting, Composites, FEA, CFD, Vibration Analysis, Bio mechanics, Nano Technology, Robotics, Heat Transfer, Alternate Fuels, Thermal energy storage and Vapor absorption refrigeration systems.



# UPCOMING EVENTS

## Organising Committee

### International Advisory Committee Members:

1. Dr. Sriram Balasubramanian, Asso. Prof., Drexel University, USA
2. Dr. Kong Pui Wah, Asso. Prof., NTU, Singapore
3. Dr. Teo Ee Chon, Asso. Prof., NTU, Singapore
4. Dr. M. Murugappan, Asso. Prof., KCST, Kuwait
5. Dr. Eko Supriyanto, Asso. Prof., Universiti Teknologi Malaysia, Malaysia
6. Dr. S. Arunachalam, Asso. Prof., JIC, Kingdom of Saudi Arabia
7. Dr. Timothe Mutwangwa, Senior Lecturer, UCT, South Africa
8. Dr. Sekar Raju, Asso. Prof., Xi'an Jiaotong-Liverpool University, China
9. Dr. J. Jeon Christopher, Senior Scientist, ASTRAZENCA, Cambridge, UK
10. Dr. S. Ramji, Queen's University Belfast, UK

### National Advisory Committee Members:

1. Dr. S. Ramakrishnan, Prof., IIT Madras
2. Dr. S. Muttan, Prof., Anna University
3. Mr. S. Sivaganesan, Additional Industrial Advisor, Govt. of India, MSME
4. Dr. R. Pariyasaamy, Assistant Prof., NIT Raipur
5. Mr. K. Mohanavelu, Scientist E, DEBEL, DRDO, Bangalore
6. Dr. Niranjan D. Khambete, Biomedical Head, Pune Govt. Hospital, Pune
7. Dr. G. Sudhir, Orthopaedic Spine Surgeon, SRMC, Chennai
8. Dr. G. Kumaramanickavel, Director of Research, Narayana Nethralaya
9. Dr. B. Minimol, Asso. Prof., Gov. Model Engineering College, Kochi
10. Dr. C.M. Sujatha, Asso. Prof., Anna University, Chennai

### Chief Patron

Ms. Kala Vijayakumar, President, SSN Institutions

### Patron

Dr. S. Salivahanan, Principal, SSNCE

### Convener

Dr. A. Kavitha, Prof & Head, Dept. of BME

### Co-Convener

Dr. V. Mahesh

Dr. S. Bagyaraj

### Organising Secretary

Ms. M. Dhanalakshmi

### Treasurer

Dr. R. Subashini

### Committee Members

Dr. S. Pravin Kumar

Dr. R. Sivarama Krishnan

Dr. L. Suganthi

Dr. J. Vijay

Dr. S. Arun Karthick

Dr. B. Geethanjali

Dr. Sachin Gaurishankar Sarate

Ms. R. Nithya

Ms. K. Nirmala

Ms. B. Divya

## Address for Communication

### Coordinators,

ICBSII 2018, Department of Biomedical Engineering

SSN College of Engineering, Rajiv Gandhi Salai (OMR),

Kalavakkam - 603 110, Tamilnadu, India.

Telephone: 044-27469700 Extn: 386, 493

Email: [icbsii@bme.ssn.edu.in](mailto:icbsii@bme.ssn.edu.in)

For further details and updates

Visit: [www.icbsii.com](http://www.icbsii.com)



## IEEE Sponsored 4th International Conference on Biosignals, Images and Instrumentation ICBSII 2018



Organised by  
Centre for Healthcare Technologies  
Department of Biomedical Engineering  
SSNCE, Kalavakkam-603110  
**ICBSII 2018**

**22nd - 24th March 2018**

## INSTINCTS 2K18!

With a captivating theme "Around The World", this year's Instincts is scheduled to happen on the 8th, 9th and 10th of March with a myriad of events, both fun filled and mind boggling..  
Get ready to travel the world in 72 hours!

