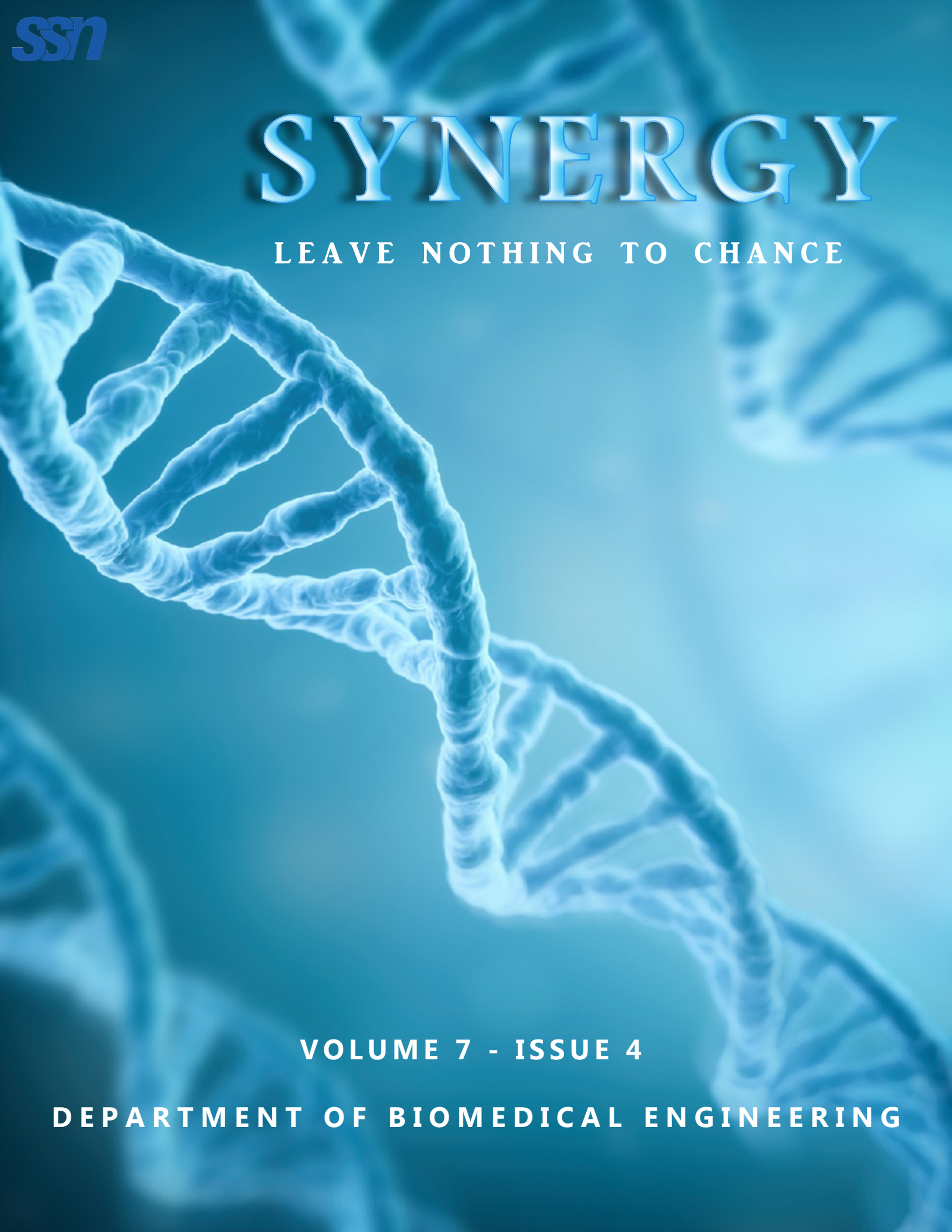

SYNERGY

LEAVE NOTHING TO CHANCE

VOLUME 7 - ISSUE 4

DEPARTMENT OF BIOMEDICAL ENGINEERING

CONTENT

The evolution of roboticsystems has taken a route th t is contraryto logic: the early, Theevolution ofrobotic ystems has taken a route that is contrary to logic: the early, Yielding to surgeons' demands, thindustry oted toward rbotic-assisted surgical devices. In themaster-slaveconfiguration, the robot (slave) translatesthe-surgeon's (master)hand, wrist andfingermovments.Thesurgicaleam assists at the patient's side,preparing entry sites and installinginstrumentsas requestedbythesurgeon. Theroboticsystemhasthree orfourrobotic appendages: two or three for instrument manipulationand anendoscope that is equipped withimage processingavisualacuity toolsthatprovide surgeowitanenhanced, three-dimensional view of the surgical site.The instruments have seven degrees of motion that mimic the human hand and wrist. The robotic arms enter the patient through a 1- to 2-centimeter opening. The surgeon controls the endoscope, with 360-degree rotation, distal and proximal movement, and zoom capability. The console instrument controls that the surgeon uses emulate scaled-down movements of instruments inside the patient. ic: the early, first-generation robots—some even cleared by the U.S. Food and Drug Administration (FDA)—were autonomous, meaning they could carry out some procedures entirely by themselves without a

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EDITOR'S DESK

HIGHLIGHTS

ROSHNI NADAR MALHOTRA FEATURED IN FORBES

OUR TEAM FEATURED IN SIR-CSIO NEWSLETTER

UNIVERSITY RANK HOLDERS

Welcome,

We are extremely happy to present the fourth edition of the seventh volume of Synergy.

This edition brings out many spotlight events of the department. It also gives an insight in to the exciting and interesting inventions in the field of Biomedical Engineering.

We congratulate our fellow mates for their achievements. We are very thankful to our HOD and all the department faculty for giving us their support and constantly moulding us. We look forward to an ecstatic journey and strive hard to bring more laurels to the department.

HOD'S DESK

Dr. A. KAVITHA
Prof. & Head
Dept. of BME

It is a feeling of immense pleasure to once again put our heads together in releasing the next issue of our newsletter-SYNERGY. This volume brings out the campus updates and various events and activities organised by the department during October 2018 to December 2018.

It also showcases the achievements of the students in various fields (academic, sports, extracurricular).I congratulate all those students who have been placed.I would like to thank all the faculty members for their seamless contribution to the department's growth and guiding the students to achieve their goals. Let's together continue to raise the glory of the department and make it a euphoric journey!

TIME TO CELEBRATE A GLORIOUS VICTORY!

ROSHNI NADAR MALHOTRA has been featured at #51 in the recent Forbes World's Most Powerful Women.

Forbes most powerful women list features the toughest, smartest women leaders the world has today, who are creating solutions for some of the world's biggest problems and making their mark.

Roshni Nadar Malhotra is the CEO of HCL Enterprise, the holding company for all group entities and vice chairperson of the publically traded company HCL Technologies.

She's responsible for all strategic decisions for the $8.1 billion enterprise, which operates in technology, healthcare and info systems.

Founded by her father, Shiv Nadar, in 1976, HCL became a central player in India's rise as an IT hub.
Malhotra is also the Chairperson of the company's CSR Committee.

She is a trustee of the Shiv Nadar Foundation, which is focused on education and has established some of India's top colleges and schools.

SCHOLARSHIP DAY

SSN scholarship day was held on the 19th December, 2018 at the Justice Pratap Singh auditorium, SSN campus to award scholarships to the deserving and meritorious students.

Right from its inception, around Rs.70 crore worth scholarships have been distributed to about 7700 students, many of them from extremely challenging backgrounds.

1st and final year students of BME recieving scholarship

Various other students from 2nd, 3rd and 4th year recieved their scholarship under the category of exemplary and outstanding.

We congratulate them on behalf of our Department and wish them for up-coming endeavours.

DEPARTMENT UPDATES

1. ETHICAL COMMITEEE MEETING

The Institutional Ethical Committee meeting of SSN college of Engineering was organised at the Department of Biomedical Engineering on 26th of October 2018.

The member secretary welcomed the chairperson, external and internal members of the committee.This is the first meeting organized in the Institute and the following members were present. Totally 18 project proposals were reviewed.

During the Meeting: The External Members, Principal SSN CE and HOD-BME.

Members present:

- Chairperson - Dr. A. Ruckmani, Professor & HOD, Department of Pharmacology, Chettinad Academy of Research and Education.
- Internal Members - Dr. S. Salivahanan, Principal, SSNCE, Dr. A. Kavitha, Professor & Head, Department of Biomedical Engineering, SSNCE.
- Member Secretary - Dr. V. Mahesh, Associate Professor, Department of Biomedical Engineering, SSNCE.
- Lawyer (legal expert) - D. Kumar, M.A., M.L., Advocate, High court, Chennai One representative of non-governmental, voluntary agency.
- P. Shanmugasundaram, Child Care Foundation, Chennai.
- One philosopher / ethicist / theologian Dr. S. Pannerselvam, Former Professor & Head, Department of Philosophy, Univeristy of Madras.
- One Lay-person from the community Ms. Niranjani, Asst Prof. Dept of Geography, Tourism and Travel Management, Madras Christian College.

2. UNIVERSITY RANK HOLDERS

Ms.Raghavi of M.E.Medical Electronics has secured the **first rank** in the Anna University examinations. She has bagged the gold medal.

Ms.Raghavi

FACTS:

Biomedical engineers created the first bionic arm. A medical breakthrough occurred in 1993 when the first bionic arm was created through the process of biomedical engineering.

Students of B.E Biomedical Engineering 2014-2018 batch bagged 12 Universirty ranks out of the total rank eligibility of 41 in Anna University, Chennai.


Bharghavi.K

- Bharghavi.K got 3rd rank


Divya Raghavi.N

- Divya Raghavi.N got 8th rank


Anuradha.L

- Anuradha Lakshmanan got 11th rank


Manasvi.S

- Manasvi.S got 12th rank


Kulsum Neha.S

- Kulsum Neha.S got 15th rank


Gayathri Devi

- Gayathri Devi.S got 21st rank


Rathi Adarshi

- Rathi Adarshi got 22nd rank


Sai Aarthi.G

- Sai Aarthi Ganesh got 25th rank


Haripriya,R

- Haripriya.R got 28th rank


Dhanuja.A

- Dhanuja.A got 34th rank


Meena Nisha.M

- Meena Nisha.M got 39th rank


Abinaya.S

- Abiniya.S got 40th rank

SSN-SRMC MOU

MOU renewal meeting between Sri Ramachandra Institute of Higher Education and Research (SRIHER), formerly known as SRMC and SSN College of Engineering (SSNCE) was held at SRIHER, Porur on 18th December, 2018. Dr. P.V.Vijayaraghavan Vice-Chancellor(SRIHER), Dr. S.P. Thyagarajan Professor of Eminence & Dean (Research) (SRIHER), **Dr.A.Kavitha**, Professor & Head, BME (SSNCE), Dr. S. Rajendiran Professor, Department of Pathology (SRIHER), Dr. V. Mahesh Senior Consultant Anaesthesiology & Critical Care Medicine (SRIHER), Dr. P. M. Venkata Sai, Senior Consultant Head of Radiology & Imaging Sciences (SRIHER) and **Ms. B. Divya**, AP, BME (SSNCE), attended the meeting. A review of the publications, joint research, knowledge sharing and other collaborative work was presented by Dr. Kavitha. Possibilities of future collaborations between the organizations were discussed in the meeting. Meeting ended on a positive note with the authorities signing the Memorandum of Understanding between the organisations renewed for the next three years.

Dr.P.V.Vijayaraghavan, Vice-Chancellor(SRIHER), Dr. S.P. Thyagarajan, Professor of Eminence & Dean (Research) (SRIHER), Dr.A.Kavitha and Ms. B. Divya in the meet

VISIT FOR COLLABORATIVE WORK

Prof. Enrico M. Staderini, Professor, Western Switzerland University of Applied Sciences, visited the department of BME and had a research discussion with Dr. V. Mahesh, Asso.Prof/BME on 25th of October 2018. After the meeting, both agreed to start a collaborative work in the area of Respiratory Mechanics and Cognitive Neuroscience.

Professor visiting the SSN Cricket Ground

Professor Staderini along with Principal SSNCE

A FEAT, YET AGAIN!

We are happy to share our participation in the SIHH(Smart India Hardware Hackathon) featured in the CSIR-CSIO newsletter!

The grand finale of Smart India Hackathon- hardware edition was inaugurated at CSIO amid fanfare and enthusiasm. It is the first of its kind- innovative methodology adopted in India that provided an opportunity to young technical minds to showcase their creativity in the form of hardware proucts.

Three of 14 teams selected for SIHH-2018 Grand Finale under the theme “Hardware Medical Devices”, held at Central Scientific Instruments Organisation, Chandigarh, were from our college, in which team illuminati was from Biomedical Department. Team Illuminati formed by Sreeja Prabakar, Ancy Carshia S, Arun Kumar K, Sucharitha S Prakash, Viswath Narayanan R, Swetha K.V guided by Dr.S.Bagyaraj, Asso. Prof., proposed a project idea titled “To put forward an early non invasive approach for diagnosis of Retinal Ischaemia”.

Among the three teams that were selected for the Finale, our team Illuminati from the Biomedical Department bagged the third prize for their prototype which was presented. We congratulate for their winning and featuring in the CSIR newsletter on behalf of our Department.

Pictures Speak -
Smart India Hardware Hackathon 2018

Director CSIO welcoming the Chief Guest during inaugural function

Honorable minister for HRD Sh. Prakash Javadekar inaugurating through Video Conferencing

Director CSIO felicitating the Chief Guest during the valedictory function

Dignitaries with the participating team during the event

UG SYLLABUS COMMITTEE MEETING

Syllabus committee meeting was held in the department conference hall with all the faculty members to discuss and finalize the syllabus for respective subjects. Based on the inputs from the faculty members the syllabus was further modified and updated.

Department faculties discussing about the UG syllabus

Dr.S.Pravin Kumar and Dr.S.Bagyaraj at the discussion

PHILIPS - SSN BME INITIATIVE

Mr. Vinod Kumar Mankala, Head of Talent Acquisition at Philips India and Mr. Anandhrajan, Subject Matter Expert, visited SSN on December 6th and met the President Ms. Kala Vijayakumar, Principal Dr. S. Salivahanan, Head of the Department, Dr. A. Kavitha and Dr. S. Pravin Kumar, Associate Professor, Department of BME to discuss the possibilities of starting a certification course along with SSN BME.

FACULTY ACTIVITIES

EXTERNALLY FUNDED PROJECTS

Dr. L. Suganthi, Asso.Prof/BME (PI), Dr. J. Vijay, Asso.Prof/BME (Co-PI) and Dr. K. Nirmala, Asso.Prof/BME (Co-PI) presented a LSRB project proposal "Design and implementation of a portable impedance cardiography system for non-invasive cardiac output monitoring" in front of steering committee members at DRDO, Bangalore on 25th of October 2018.

INTERNALLY FUNDED PROJECTS

SUBMITTED:

1. Dr. Vijay Jeyakumar, Asso.Prof/BME, Dr. S. Saraswathi,Assoc. Prof., CSE, Dr. S. Arun Karthick, Asso.Prof/BME submitted a project proposal titled "Design and Development of Textronic system for continuous monitoring of Physiological parameters" on 31st of October 2018.
2. Dr. S. Arun Karthick, Asso.Prof/BME submitted a project proposal titled "Functionalised nasal filter for ABC filtration" on 31st of October 2018.
3. Ms. M. Dhanalakshmi, AP/BME submitted a project proposal titled "Design and development of Hi-Tech composite blades for lower limb amputees" on 31st of October 2018.
4. Dr.Sachin Gaurishankar Sarate, Asst Professor/BME submitted a project proposal titled "EMG Analysis of cricket Batsman foreman muscles while executing different phases of batting strokes" on 20th of October 2018.

SANCTIONED:

Ms. B. Sutheshnna (III year BME), Ms. Kavya.V.Kannan (III year BME), Mr. M. B. Venkatesh and Mr. M. Roshan (II year Mechanical Dept) are sanctioned with a Student Consortium Project worth Rs.9.5 Lakh for 2 years on 2nd of November 2018. Dr. A. Kavitha, Prof & Head/BME, Dr. S. Suresh kumar, Asso.Prof/Mech and Ms. R. Nithya, Asst.Prof/BME are guiding the project.

JOURNAL PUBLICATIONS

- Eswaran Vishal Sudha Bhagavath, Mahesh Veezhinathan, Geethanjali Balasubramanian, and Atul Taneja. " Virtual Reality Therapy for Mental Stress Reduction." Journal of Clinical & Diagnostic Research,Month : October ,Volume : 12, Issue : 10, Page : JC11 - JC16.

- Felix Swamidoss V, Mohan Bangaru, Gobi Nalathambi, Dharmalingam Sangeetha & Arun Karthick Selvam, "Silver incorporated Poly Vinylidene Fluoride (PVDF) Nanofibres for Bacterial Filtration", Aerosol Science and Technology, December 2018. (IF:2)

- Mahalakshmi Nachiappan, Thenmozhi Alagarsamy, Vijay Jeyakumar, "design of Mirror-E Shape Implantable Antenna for Biomedical Applications". Journal of Applied Mathematics & Information Sciences, December 2018. (IF:1.2).

EVENTS/MEETINGS ATTENDED

- Dr. A. Kavitha, Prof & Head/BME and M. Dhanalakshmi, AP/BME met Mr. Balram TG, Associate Vice President, HCL Tech and Kalirajan, Technical Manager for a project discussion at HCL Tech, Ambattur on 11th of October 2018.
- Dr. R. Subashini, Asso.Prof/BME conducted Ph.D. confirmation meeting for Ms. P. Meenachi, full time research scholar in BME Conference room, SSNCE on 27th of November 2018.
- Dr. S. Arunkarthick, Asso.Prof/BME, Dr. R. Subashini, Asst.Prof/BME and Ms. B. Divya, Asst.Prof/BME attended a two day Workshop on 'positive mentoring' organized at Central Seminar Hall, SSNCE on 29th - 30th November 2018.

FACTS:

In 1993, five Biomedical engineers in Edinburgh, Scotland created the first functional Bionic arm. Known as the Edinburgh Modular Arm System, the arm contained miniature motors, gears, pulleys, microchips and position-control circuits. The arm also had artificial fingers for gripping objects, a twistable wrist, a bendable elbow and a rotating shoulder. In 1998, the arm was fitted onto a patient who wore a cap equipped with multisensors that received electronic brain pulses and controlled the arm's movement.

- Dr. S. Arunkarthick, Asso.Prof/BME participated in an AICTE Sponsored Short Term Course on "Biomedical Optics and Instrumentation", organized by Department of Applied Mechanics, Indian Institute of Technology Madras during 3rd to 7th of December 2018.

Participants of the short term course in IIT, Madras

Dr.Arun Karthick recieving certificate

- Dr. J. Vijay, Asso.Prof/BME participated in WHO 4th Global forum on Medical devices organized by World Health Organization along with Andhra Pradesh Medtech Zone (AMTZ), Vizag on the 13th and 14th of December, 2018.A report of the event is given below....

The main objective of this programme is to focus on "increasing access to medical devices" towards universal health challenge with following strategic plans.

1.To define methods of increasing and measuring access to essential and priority medical devices under Universal Health Coverage in compliance with the Sustainable Development Goals.

2.To share country evidence of best practices in regulating, assessment and management of medical devices.

3.To demonstrate the development and the use of innovative and appropriate affordable technologies to respond to global health priorities.

4.To share WHO tools and guidelines on medical devices for better implementation.

Inaugural ceremony of 4th WHO Global Forum


Kalam Convention Centre

The Three day programme was inaugurated by Shri.C. Chandra Babu Naidu, Chief Minister of Andhrapradesh and Dr. Jitendra sharma Director of AMTZ gave the welcome address to the gathering. Total of 1049 participants from 90 countries participated in this three day forum.

- Ms. M. Dhanalakshmi, AP/BME met Ms. N. Srilekha, Group project Manager, HCL Technologies, Ambattur regarding consultancy work led by Dr. A. Kavitha, HOD/BME on 21st of December 2018.

- Dr. S. Pravin Kumar, Asso.Prof/BME, Dr. J. Vijay, Asso.Prof/BME and Dr. S. Bagyaraj, Asso.Prof/BME visited Healthcare Technology Innovation Centre of IIT Madras and interacted with Mr. Kiruthi Vasan, Principal System Architect (Diagnostics) regarding the industry-academia collaborative opportunities on 12th of December 2018.

FACTS:

In addition to their involvement in bionics, Biomedical engineers also design and build other artificial organs, such as kidneys and hearts, cardiac pacemakers and hearing aids. They also create artificial legs, joints and vessels. Biomedical engineers are also responsible for inventions like the laser systems used in eye surgery, automated insulin delivery systems and computer-based systems that analyze diseases.

- Dr. S. Bagyaraj, Asso.Prof/BME and Ms. B. Divya, AP/BME attended the "Workshop on Brain Connectivity analysis and Conference on Brain Computer Interface", organized by Deparment of Imaging Sciences and Interventional Radiology, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Thiruvananthapuram in association with Kerala State Council for Science, Technology and Environment (KSCSTE) andScience and Engineering Research Board (SERB), Government of India from 28th to 30th of December 2018. A brief report of the event is given below...

The three days program was conducted in an efficient manner to equip the neuroscientists in India with hands-on experience in brain connectivity analysis by mastering CONN Toolbox and also the program opens new avenues to more sophisticated BCI technique.

Participant's lists includes Radiologists from different hospitals who are working on clinical research, professors and research scholars from different institutions who are working in the area of cognitive neuroscience. This type of workshop is a rare platform which gives an opportunity of exchanging the knowledge and bridging the gap among clinicians and neuroresearchers.

Dr. S. Bagyaraj and Ms. B. Divya at the conference

CONN is a premier software package for connectivity analysis and has been used in over 750 publications. The hands on workshop was supervised by Dr. Sheeba Arnold Anteraper, who is working with developers of CONN and is the Senior Programmer at the McGovern Institute, and an expert supervisor in the premier training workshop organized by Martinos Center for Biomedical Imaging, USA.

The Second Leg of the programme was a Conference on Brain-Computer Interface. It facilitates direct communication between the brain and an external device.Dr. Ranganatha Sitaram, Associate Professor and Director of Brain Machine Interfaces and Neuromodulation Laboratory at the Pontifical Catholic University of Chile, Dr. Vinod A , Professor and Dean – Industry Collaboration and Sponsored Research, Electrical Engineering, IIT Palakkad, Kerala, handled the sessions. A motivational talk on EEG based Functional Connectivity analysis for BCI applications by a young researcher, Mr. Tushar Chouhan, NTU Singapore was also given.

A few sessions was mainly focused on the BCI applications using fNIRS system, which is an upcoming neuro imaging technique. Sessions were handled by Mr.Sujesh Sreedharan and Mr.Arun K.M, researchers at SCTIMST who were giving the insights about real time fNIRS based BCI and its applications.

PAPERS PRESENTED

- Jevitha Sankar, Dhanalakshmi .M and Pradeep G Nayar, presented a paper on"Analysis of left main coronary bifurcation angle to detect stenosis", in the 18th International Conference on Intelligent systems design and applications (ISDA) held at VIT Univeristy, Vellore during 6th to 8th of December 2018.

- Vijay Mani Shankar L., Mahesh V., Geethanjali B., Subashini R. (2019) Automated Segmentation and Computation of the Leukocytes Based on Morphological Operator. International Conference on Intelligent Data Communication Technologies and Internet of Things (ICICI) 2018.

AWARDS RECEIVED

- Dr. J. Vijay, Asso.Prof/BME received Sri P K Das memorial Best Faculty Award and Cash Prize from **Nehru Group of Institutions under Bioscience Junior category** at Coimbatore on 15th of December 2018.

Dr. J. Vijay receiving the Best Faculty Award

TECHNICAL PAPERS REVIEWED

- Dr.B.Geethanjali, Asso.Prof/BME reviewed an article titled "The Cognitive Demands of Gait Retraining in Runners: An EEG Study" for Journal of Motor Behaviour [Taylor & Francis] .

- Dr. J. Vijay, Asso.Prof/BME has reviewed the following manuscripts: "Enhanced Data Security for Public Cloud Environment with Secured Hybrid Encryption Authentication Mechanisms," submitted to the Journal of Scalable Computing: Practice and Experience.
  "Execution Analysis of Spatial Data Storage Indexing on Cloud Environment" submitted to the Journal of Scalable Computing: Practice and Experience.

- Dr. K. Nirmala, Asso.Prof/BME has reviewed the following manuscript: "A Machine Learning Approach for High Intraocular Pressure Detection Using Frontal Eye Image Features" submitted to IEEE Access.

- Dr. V. Mahesh, Asso.Prof/BME has reviewed the following manuscript: "Automatic Classification of Facial Nerve Paralysis By Deep Convolution Neural Network submitted to Journal of Medical Imaging and Health Informatics".

- Dr. V. Mahesh, Asso.Prof/BME acted as reviewer for the conference ICBEST 2018- NIT Raipur - 1st International Conference on Biomedical Engineering Science and Technology: Roadway from Laboratory to Market.

OTHER ACTIVITIES

- Dr. V. Mahesh, Asso.Prof/BME acted as question paper setter for Annamalai University Examinations (Engineering and Technology - Hospital Instrumentation and Management Examinations) for the subjects, sensors and measurements, healthcare systems, Hospital Management and IT for Healthcare, Telehealth Systems and Hospital Safety Systems and Health Standards.

- Dr.S.Arun Karthick, Asso.Prof/BME acted as a question paper setter for Rajalakshmi Engineering College (Autonomous), PG Examinations for the subject Biomaterials.

FACTS:

Biomedical engineering is always evolving to improve health care. For example, biomedical engineers at Duke University are developing a new way to regenerate spinal discs. The degeneration of back discs commonly occurs as people get older, and the spine's shock absorbers deteriorate. This can cause severe pain that may also lead to herniated discs, osteoarthritis and spinal stenosis. The Duke team created a liquid that is injected into the disc space and turns into a gel cushion that evenly distributes pressure and alleviates back pain.

STUDENT PURSUITS

1. WORKSHOP ATTENDED:

- S. Om prakash of final year participated in SSN Analytica workshop on 1st of December 2018.

2.INTERNSHIPS/TRAINING:

- Janaki and Nandhini of 2nd year attended an Internship at TTK Healthcare for two weeks.
- S. Om prakash of final year attended a hospital training in Gleneagles global health care during 7th to 14th of July 2018.

3. PUBLICATIONS:

- S. Om prakash of final year published an article in Journals of clinical and diagnostic research.

4.SPORTS

Kezia Sharon.C of 3rd year got selected to represent Anna University for the third consecutive year in the south zone inter university tournament.

She was also a part of the SSN table tennis team which won the Anna University inter zonals table tennis tournament held at Abdul Hakeem College on 13th and 14th October 2018.

4. OTHER ACTIVITIES:

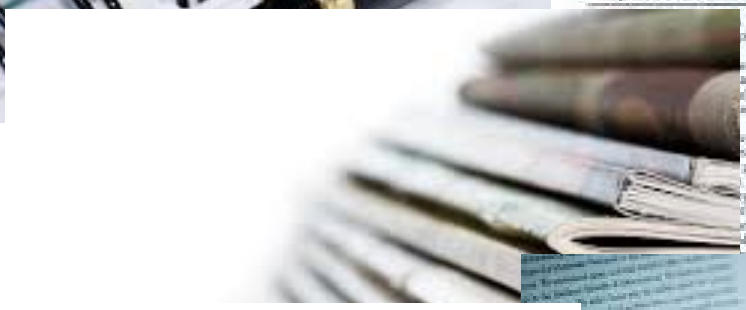
- Mayura of 2nd year have attended Bharathiar Dance Drama for Pondichery Government
- Naresh Narendernath E acted as:
  Campus Ambassador for IIM Indore Technical Fest (Drona)
  Campus Ambassador for BITS PILANI Quark 2019- Cognitive Over drive

FACTS:

Pierre Gentine, Associate Professor of earth and environmental engineering, co-authored a study on using machine learning to improve accuracy of climate prediction models. He worked with researchers from the University of California, Irvine, and the Ludwig Maximilian University of Munich to use data science to achieve better cloud representation. They trained a deep neural network to predict the results of thousands of tiny, high-resolution cloud-resolving models that were then used to predict clouds in a coarser resolution model. The newly taught program, dubbed "The Cloud Brain," functioned freely in the climate model, leading to stable and accurate multiyear simulations that included realistic precipitation extremes and tropical waves. The paper was published September 6 in the Proceedings of the National Academy of Sciences.

ARTICLES


Images from the heart
PEMBROKESHIRE PROMISE
Heather Bennett



AN MRI THAT WON'T SCARE KIDS AND COULD HELP ADULTS!

Today's MRIs are anything but kid-friendly. But if a group of doctors and engineers have its way, that problem will be a thing of the past. A typical MRI exam involves the patient lying down on a narrow bed that is pushed into the bore of a large magnet. As part of the exam, the body is subjected to a strong magnetic field which makes the protons in the body's water molecules align their spins with the magnetic field. The protons in the area that needs to be studied are then selectively manipulated to give off radio waves. A heavy receiver coil is placed on the area, acts like an antenna, and picks up the radio wave signals.

The MRI signal is relatively small and must be sampled long enough for clinicians to detect it in a large sea of various radiofrequency signals. It is also critical for the patient to be motionless, as voluntary movement, or even that from a rapid breath or heartbeat, might corrupt the data.

All this is bad news for kids. The coils are heavy and scary, children can't lie still for long, and they have faster breathing and heart rates than adults and often need to be sedated. To avoid these challenges, pediatricians will often choose alternative procedures, such as CT scans and ultrasound. But those may not provide the same sensitivity or specificity to diagnose diseases.

Shreyas Vasanawala, MD/PhD, a pediatric radiologist at Stanford University, along with a group of interdisciplinary engineers, believes there's an alternate solution: Instead of skipping an important imaging tool such as an MRI, solve the stumbling blocks that deter medical professionals from

ordering one for children.

Vasanawala's approach involves addressing two of the biggest challenges: the intimidating weight of the coils and the amount of time needed to capture accurate scans. These interdisciplinary efforts to make MRIs more kid-friendly involve a number of key researchers.

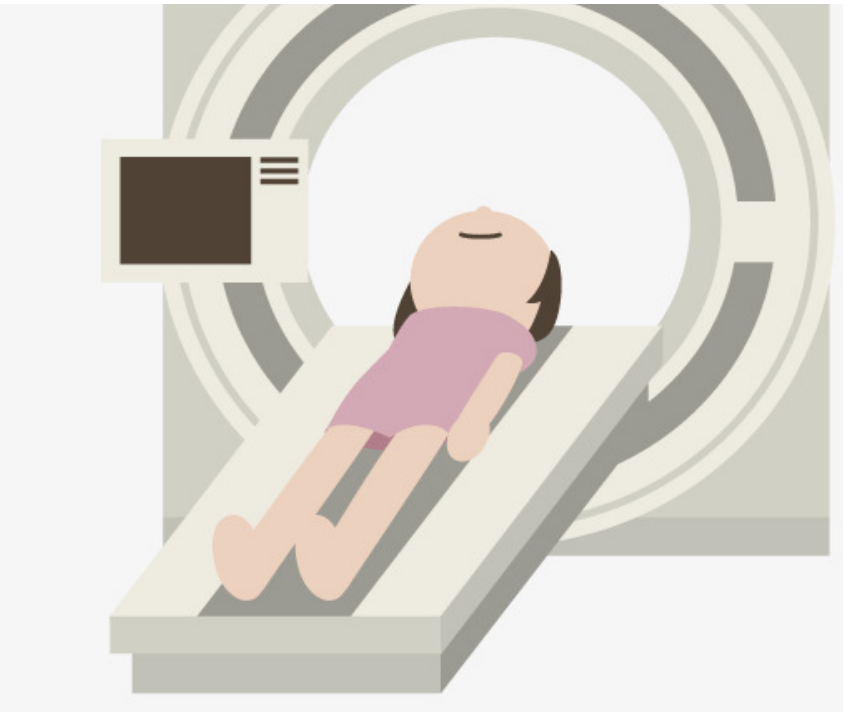
John Pauly and Greig Scott, electrical engineers at Stanford, for example, are working on making the coils lightweight and flexible. They are developing new methods of transmitting signals without the requirement for bulky cables. Vasanawala is also working with Ana Claudia Arias and Michael Lustig at University of California, Berkeley, to develop flexible coils that can be printed with conductive inks on fabric, so the child only need wear a snug T-shirt housing the embedded coils.

"Our vision is to have it be bespoke, tailored for individual patients," said Vasanawala, who also serves as director of MRI at Stanford Children's Health. "Right now we have developed different sizes that are flexible and lightweight, but the overall goal for the project is to have the whole system embedded in cloth so the child wouldn't know there is hardware being placed on." The child-sized coils are not only more comfortable, but they also cut down on background noise and interference, thereby delivering better quality images, Vasanawala said.

All this begs the question: Wouldn't faster scans be advantageous for everyone, kids and adults? Why not work on applying these technologies across the board?

“Sure, there are definitely a lot of benefits for adults and they have flowed over to the adult side,” Vasanawala said. But our motivations are driven by kids and to make their experiences easier instead of having to adapt adult solutions to pediatric problems.”

“Over the years we have done many long conventional [MRI] exams and have a lot of data to work with to arrive at very good-quality image reconstruction,” Vasanawala said. “So now we can subsample this data and train neural networks to learn how to reconstruct images with very little data.” This enables faster scanning. Vasanawala credits graduate students Christopher Sandino and David Zeng with advancing imaging speeds by an order of magnitude.



Work is also being done in figuring out algorithms that will reconstruct images using motion-correction strategies, something that is invaluable for MRI use in kids. Scans that used to take an hour can now be done in ten minutes.

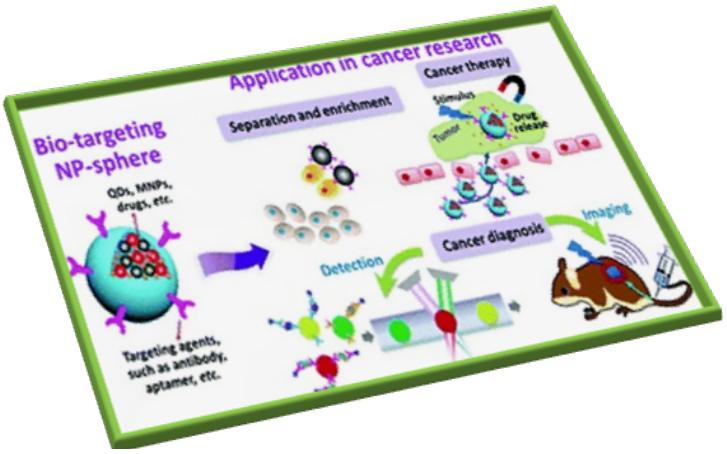
All this begs the question: Wouldn't faster scans be advantageous for everyone, kids and adults? Why not work on applying these technologies across the board? "Sure, there are definitely a lot of benefits for adults and they have flowed over to the adult side," Vasanawala said. But our motivations are driven by kids and to make their experiences easier instead of having to adapt adult solutions to pediatric problems."

FACTS:

In a first-of-its-kind operation in the U.S., a team of Duke doctors helped create a bioengineered blood vessel and transplanted it into the arm of a patient with end-stage kidney disease. The new vein is human cell-based product with no biological properties that would cause organ rejection. Researchers engineered the vein by cultivating donated human cells on a tubular scaffold to form a vessel. The vessel then is cleansed of the qualities that might trigger an immune response. If the bioengineered veins prove beneficial for hemodialysis patients, the researchers ultimately aim to develop a readily available and durable graft for heart bypass surgeries, which are performed on nearly 400,000 people in the U.S. every year, and to treat blocked blood vessels in the limbs.

IMPORTANCE OF BIO NANOPARTICLES IN CANCER RESEARCH

Nanoparticles possess size in the range of 10-9 nm which is very small in the molecular range. The physical and chemical properties of nanoparticles are different from that of the bulk. Though a nanoparticle can be produced by electrochemical, microwave assisted, precipitation, etc., methods, the biologically synthesized nanoparticles, also known as bio nanoparticles, are ecofriendly and their synthesis process involves no toxic substance. Cancer is one of the deadliest diseases in which the uncontrolled growth of abnormal cells occurs within the body. According to World Health Organization, cancer being the second leading cause of death globally is responsible for an estimated 9.6 million deaths in 2018.



The bio nanoparticles interact with tumor and its microenvironment by interacting with the biomolecules like proteins, carbohydrates present in it through bio molecular corona formation. The advantages of using bio nanoparticles in the cancer include enhancing solubility, prolonged circulation time, minimized non-specific update, prevented undesirables off-target and side effects, improved intracellular penetration and allowed specific-targeting. The applications of bio nanoparticles in cancer include detection of cancer cells, delivery of chemotherapeutic agents, visualization of the location of tumor cells in the body and delivery of drugs only to these cells, killing of cancer cells by sparing the normal cells or with minimal effects, monitoring the effect of treatment in real-time and providing feedback.

Dr. R. Subashini

THE TECHNOLOGICAL DEVELOPMENTS IN BIOMEDICAL

The latest technologies for personal fitness, wellness, and health monitoring were on display at the 2018 edition of the Consumer Electronics Show (CES2018). Traditionally known as the launch pad for next-generation television, audio systems, gaming, and other popular gadgetry, CES devoted a healthy portion of its 2.75 million square-foot exhibit floor to products that help people prevent or manage significant health problems like stroke, cancer, and diabetes. Health and wellness tech have moved beyond the domain of wearable fitness monitors. Specialized monitors and trackers now allow users who have or are at risk of developing serious diseases to take charge of their own long-term health by measuring day-to-day trends. Here are five nominated products in the health, fitness, and biotech field that gained recognition in this year's CES Innovation Awards showcase.

SOCKING IT TO DIABETES :

Diabetes has been on the rise in our nation. More than 62 million Indians today are living with diabetes or prediabetes. Diabetes is the nation's seventh-leading cause of death, and its prevalence continues to grow along with the obesity epidemic. Improperly treated diabetes can damage peripheral nerves and blood vessels in the body's extremities. In the feet, this damage gives rise to ulcers that can quickly become infected and don't heal properly – resulting too often in lower-leg amputations and an increased likelihood of premature death. For obvious reasons, physicians coach their patients with diabetes to take good care of their feet. But even with close care, once a problem has become visible to the eye it is much harder to deal with. Siren has developed high-tech socks with embedded sensors seamlessly embedded into the company's proprietary Neuro-

fabric. The sensors continuously monitor temperature at the bottom of the feet. Temperature changes in the skin are a clinically tested indicator of inflammation, a tell-tale sign the body is fighting an infection. Six sensors are embedded into the socks at the most common sites of diabetic foot injuries. Measurement data is sent to the user's smart phone, which sends an alert when temperature rises are detected. Users without smart phones can use a special plug-in device that receives data and forwards it to Siren's customer service department, which calls or texts alerts into the user when temperatures rise. The socks are washable and dryable, and replacements can be ordered on a subscription basis.

TAKING THE ITCH OUT OF BUG BITES :

Generations of moms have warned their kids that scratching their mosquito bites would only make them itchier. That advice carries more clout today as mosquito-borne viruses of the developing world such as zika, dengue and malaria make inroads in India. Recent studies have found a direct connection between scratching, inflammation, and a more rapid replication of the virus in infected people. With more than 5000 symptomatic cases of Zika virus reported in the India to date, many people are eager for protection against it and other diseases once unheard of in this country. The Maxogen Group's response is the Bite Helper, a device that neutralizes the itch and irritation of insect bites. The company's proprietary Thermo-Pulse-Technology delivers heat and vibration to the bite area, which increases blood flow and circulation. The immediate consumer benefit is itch relief without chemical bug repellents or anti-itch medicines. However, by enabling bites to heal and go away on their own without further inflammation, the Bite Helper may help contain the spread of dangerous infections.

Vindhya.M, 3rd year

UPCOMING EVENT

FIFTH INTERNATIONAL CONFERENCE

BIOSIGNALS, IMAGES, AND INSTRUMENTATION

ICBSII 2019

WWW.ICBSII.COM | MARCH 14 - 15, 2019 | CHENNAI

The Department of Biomedical Engineering, SSNCE is organizing the Flfth International Conference on Biosignals, Images, and Instrumentation (ICBSII 2019) during March 14 - 15, 2019 for deliberating with renowned experts in this field. This invitation is open for all academicians, research scholars, Post-Docs, PG and UG students working in the field of Biomedical Engineering related areas.

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ICBSII 2019 is an opportunity for medical engineering professionals from around the world who are involved in the field of healthcare to submit their original research papers which have not been submitted elsewhere in other conference/journals. All selected papers presented in the conference will be published in Springer Lecture Notes "Medical System Design and Data Processing".

Bio – signals Track

- Biomedical Signal Processing.
- Cardiovascular & Respiratory Systems Engineering.
- Cognitive Neuroscience.
- Brain Computer Interface.
- Speech Signal Processing.

Images Track

- Biomedical Imaging and Data Visualization.
- Computer Aided and Automated Diagnosis.
- Medical Image Mining & Retrieval system.
- Optimization techniques.
- Virtual Reality.

Instrumentation Track

- 3D Bio-printing.
- Device Technologies & Biomedical Robotics.
- Drug Delivery & Diagnostic Systems.
- IOT & Healthcare Information System.
- Mobile Health and Wearable Sensor Networks.
- Advances in Biomedical Instrumentation.

PAPER SUBMISSION

Authors can submit their manuscripts through the following link,
https://easychair.org/conferences/?conf=icbsii2019

REGISTRATION

Registration fee can be payable by Demand Draft (DD) / cheque in favor of "The Principal, SSN College of Engineering" payable at Chennai (or) wired transfer.

Category	Early Bird Registration	Late Registration
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Full Paper Submission:
February 18, 2019

Acceptance Intimation:
February 25, 2019

Submission of Revised Paper:
March 01, 2019

Camera Ready Paper Submission:
March 05, 2019

Early Bird Registration:
February 28, 2019

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