SYNERGY

A
BIOMEDICAL
NEWSLETTER

Volume 9: Issue 2

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EDITORIAL DESK

Warm greetings to everyone!!!

"The purpose of Education is to replace an empty mind with an open one."

In this edition of the department's newsletter, we share with you the great accomplishments of our students.

This edition covers the happenings in the department from the months of January to March 2021. We highlight the achievements and participation of the students and faculty.

Presenting to you the second issue of the ninth volume of SYNERGY.

"If You Are Working on Something That You Really Care About, You Don't Have to Be Pushed. The Vision Pulls You."

– Steve Jobs

Wishing you all a happy learning.

- Editorial board

HOD's DESK

It gives me immense joy to be writing the foreword for our department's newsletter SYNERGY. In this issue, significant activities in the campus and the department of Biomedical engineering are highlighted along with the accomplishments of our faculties and students between the months of January and March 2021.

2020 was definitely a tough phase in every aspect and I am very happy to see that the New Year has brought with itself a lot of positivity and happiness and that is definitely being reflected in the achievements of our faculty members and students.

I hope and pray that this year continues to be one filled with happiness, success and most importantly good health. Let's continue to brave through any difficulty that might come our way and emerge as a stronger, wiser and better individual.

Wishing you all the best of everything!

Dr. A. Kavitha

CAMPUS UPDATES

Lifetime Achievement Award to Dr. Shiv Nadar

CNBC TV18 has honored Dr. Shiv Nadar with the 'Lifetime Achievement award at the 'India Business Leader Awards' 2021. The award celebrates Dr. Nadar's pioneering role in the Indian IT landscape and in philanthropy. A true visionary who turned an Indian IT garage start-up into a $10 billion global conglomerate that employs more than 150,000 professionals across 50 countries, Dr. Nadar has also built great institutions of transformational education that will continue to nurture the country's youth for generations to come. A shining example of this is Shiv Nadar University. He has contributed a massive $900 million towards education and still continues to do so. From its humble beginnings, HCL has risen to great heights due to his sheer hard work and determination and now he has a net worth of $24.6B making him the third richest person in India and the 103rd Billionaire in 2020.

"Any long term is made of many tomorrows"
-Dr. Shiv Nadar

One of Asia's most distinguished awards for excellence in leadership, the CNBC-TV18 'India Business Leader Awards' honors visionaries who have made revolutionary advancements in their spheres and risen beyond the industry threshold by setting new standards in terms of growth, scale and market leadership.

"If you are calm about your ambitions, you become confident of achieving what you set to do"
-Dr. Shiv Nadar


Dr.Shiv Nadar awarded 'Lifetime Achievement Award' at Indian Business Leader Awards 2021
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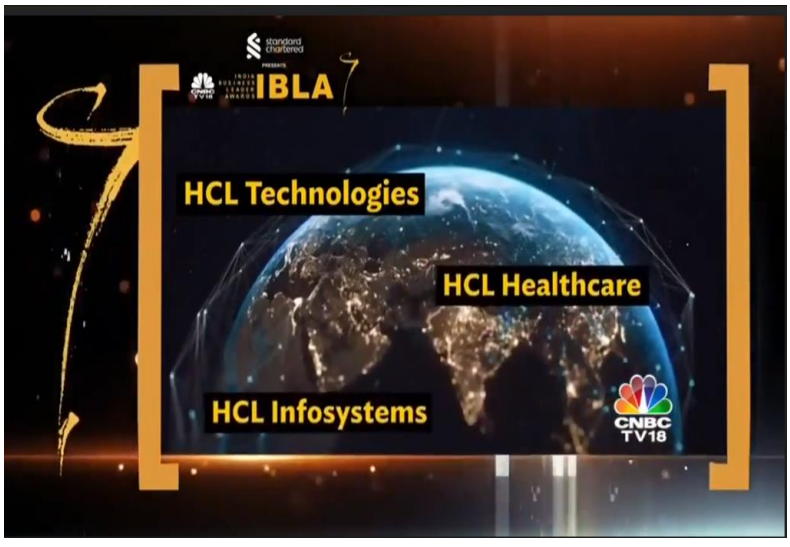
CNBC TV18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HCL Technologies
HCL Healthcare
HCL Infosystems
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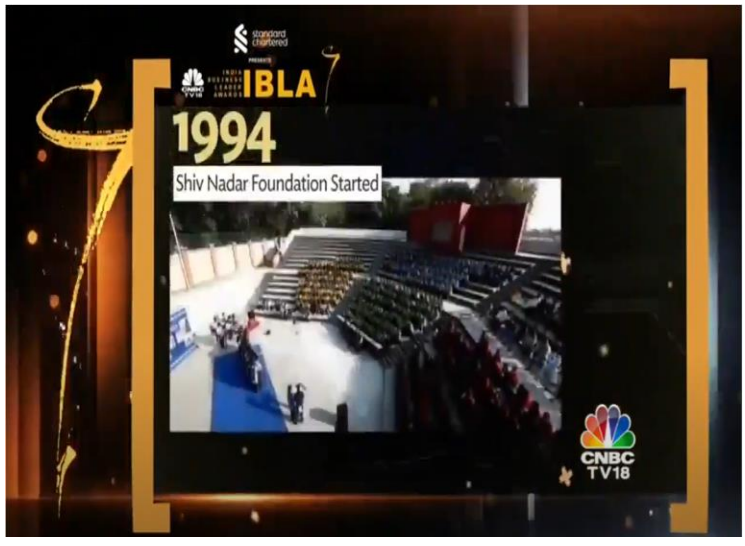
IBLA
1994
Shiv Nadar Foundation Started
CNBC TV18


IBLA
1996
Founded SSN College Of Engineering In Chennai, Tamil Nadu
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Dr.Shiv Nadar awarded 'Lifetime Achievement Award' at Indian Business Leader Awards 2021
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2007
Awarded An Honorary Doctorate Degree By Madras University
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MORE VIDEOS


IBLA
2008
Awarded The Padma Bhushan For His Contribution To The IT Industry
CNBC TV18

INVENTE 5.0

After months of hard work by the students of Sri Sivasubramaniya Nadar college of Engineering the technical fest Invente took place on the 22nd and 23rd of January 2021.This two-day fest was inaugurated by the honorable Chief guest Dr. Srimathy Kesan, Founder and CEO Space kidz India along with dignitaries, the Principal, SSN college of engineering Dr. V. E. Annamalai and faculty members. The event began with an offering to the almighty by the students of the college. The chief guest then delivered an energetic address to the gathering, the talk was truly motivating and inspired the students to bravely venture into various interesting domains of research and startups. The specially designed invente magazine - Tech Vibe was released by the chief guest. The whole proceeding was hosted by Mr. Anam Sathvik Reddy.

The college principal Dr. V.E. Annamalai with the presidents of each department.

During Invente 5.0, the set of roughly 60 events were conducted virtually by eight departments out of which 8 events were conducted by The Biomedical Department. Out of the 8 events, we saw four technical events being conducted and four non-technical events including a workshop by the IEEE EMBS Society of our College. e-Biomart, an event which brings out the fun entrepreneur among the participants saw close to 10 participants participating actively with innovative solutions. Medical Mystery, a biomedical quiz event and Dead Man's Chest, a fun non-technical event, both saw a healthy number of participants enthusiastically taking part.

INVENTE 5.0

Invente Organizing Team

Escape the Hill House, inspired by the very popular mystery maze saw a huge number of participants with close to 60 students taking part with a close finish!

Min-E-Olympics, a fun filled non-technical event with several exciting mini games saw 21 teams combating each other with a high-adrenaline boost mode.

Paper Presentation saw 20 participants presenting their research work to our Professors, Dr. S Arun Karthick and Dr. S Bagyaraj who grilled the participants with their sharp technical acumen and decided the winners.

The Workshop conducted by the IEEE EMBS Society of our department saw over 50 participants enthusiastically attending the workshop on the trending topic of Space Biology.

INVENTE 5.0

Overall, the students of The Biomedical Department, with their intense efforts made this event a fruitful one.


INVENTE BME TEAM:
Dr.A.Kavitha - Overall Coordinator
Ms. Dhanalakshmi M - Faculty Coordinator

The list of office bearers for the Association of Biomedical Engineers is as follows:

- Rajkumar A J - President
- Varshini V – Vice President
- Gurucharan M K - Secretary
- Sharmilee S – Treasurer
- Saranya V – Event coordinator

DEPARTMENT VENTURES

ICBSII 2021 Preconference Workshops on Artificial Intelligence in Healthcare

Dr. A. Kavitha and Ms. B. Divya organized and conducted IEEE EMBS Madras Chapter Sponsored International Pre-Conference Workshop on “Artificial Intelligence in Healthcare” from 23/03/21 to 24/03/21. The workshop was conducted by five eminent speakers with major focus on the importance of artificial intelligence in healthcare.

Speakers of the workshop

DR. YUVARAJ RAJAMANICKAM

(Research Scientist, National Institute of Education, Singapore)

Dr. DAVID BELO (Group Leader and Artificial Intelligence

(Researcher, LIBPHYS-FCT, NOVA University of Lisbon, Portugal.)

Mr. RUI VERANDAS

(Research Engineer, Plux. LIBPHYS-FCT, NOVA University of Lisbon, Portugal).

DEPARTMENT VENTURES

Ms. PAYAL NANAVATI

(President & Founder, Delsur Consulting, San Diego, California, USA).

Mr. KARTHIK KUMARASWAMY

(Senior Vice-President, Tringapps, in San Francisco, USA)

The preconference workshop on the first day was started with the inauguration function where the HOD, Department of Biomedical Engineering greeted the attendees and the speakers.

On Day-1, The First session was by DR. Yuvraj Rajamanickam, He gave us a brief idea about various topics such as – (1) On Brain machine interface to enhance motor recovery of spinal cord injury. (2) Automated epileptic detection from scalp EEG recording. (3) Localization of sub-thalamic nucleus for DBS stimulation in Parkinson disease.

The Second Session was by Mr. Rui Varandas. He gave a brief talk on Deep Neural Networks like DNN, CNN, RNN, No free lunch Theorem and its objectives – Normalisation, quantisation, Noise Reduction and segmentation. We also learnt about signal synthesis and why we should go for filtering, Smoothing and baseline removal. in the given data set. And later it was followed by Dr. David Belo. Hands on training was conducted on separate data for Cross-validation from Bio-Signal Synthesis. He also taught us how to encounter the error faced during the syntheses of data.

DEPARTMENT VENTURES

On Day-2, The First Session was given by Ms. Payal Nanavati, who gave more insights about the drug development, advancements in biomedical sciences like 3D printing in organs. Students interacted with her about the current advancement in biomedical research and gained more knowledge.

The Second Session was by Mr. Karthik Kumaraswamy, He talked about oculus devices used by the patient where the virtual stimulation is created and the patient can experience the full 3D immersive experience. He also talked about various possibilities for the project funding, where he talked about entrepreneurs and startups.

The Third Session by Mr. Rui Varandas and Dr. David Belo was followed where the Day-1 session ended. He gave us a brief insight on hands on training. He also further talked about the Artificial Neuron- Metrical Representation- Neutral zoo, Long- short term memory, Architectural configurations like Reinforced learning, Generative Adversarial networks. He gave more knowledge on objective functions like Error Minimization, Training Paradigms and Gradient issues.

Workshop was a grand success with participation of students, research scholars and industry people across the country and abroad. The concluding outcome was that the session was very interactive. All the attendees showed their full interest and gained knowledge. We also learnt about how one can approach for the funding of the projects that is more about startups in the biomedical field. The hands-on training session was really meaningful where we got to learn the importance of the neural networks and how we can implement it.

DEPARTMENT VENTURES

IEEE 2021 SEVENTH INTERNATIONAL CONFERENCE ON BIOSIGNALS IMAGES AND INSTRUMENTATION (ICBSII 2021)

Biomedical Department's annual extravaganza!

The IEEE Seventh International Conference of Biosignal, Images and Instrumentation 2021 (ICBSII 21) organized on March 25 – 27, 2021, brought together the chief guest, guests of honor, speakers and participants from various parts of the world. ICBSII 21 was held virtually, organized by the Department of Biomedical Engineering, Sri Sivasubramaniya Nadar College of Engineering.

The event witnessed a great start due to the august presence of our President ***Dr. Kala Vijayakumar***, President of Sri Sivasubramaniya Nadar Institutions, Pro Chancellor, Shiv Nadar University, Chennai, ***Dr. Sriman Kumar Bhattacharyya***, Vice Chancellor of Shiv Nadar University, Chennai and ***Dr. V.E. Annamalai***, Principal of Sri Sivasubramaniya Nadar College of Engineering.

The President, Dr. Kala congratulated the faculty and students of the department for conducting the seventh International conference successfully and appreciated the team for making it truly global with guests, speakers and participants from all over the globe. The Vice Chancellor of Shiv Nadar University, Chennai, expressed his happiness in being a part of the conference and mentioned that the young department is very impressive in terms of research accomplishments.

DEPARTMENT VENTURES

The conference had tremendous positive vibes and enthusiasm, spreading the same to the guests, speakers and the participants from almost all continents of the world. The Head of the Department ***Dr. A. Kavitha***, the Chief guest, Guests of Honor, the Patrons, Guest Speakers and the participants, and invited everyone to indulge in interesting research findings to be discussed during the conference.

The keynote address was delivered by the expert members in various topics on Human Voice Analysis, Mental Health – Brain Stimulation, Biomechanics and Rehabilitation Engineering, Development of Medical Devices, and Clinical Engineering.

Dr. Hasan Ayaz, Cognitive and Quantitative Experimental Research Drexel University, USA was invited as chief guest for the inaugural function and ***Dr. Sriram Balasubramanian***, Orthopedic Biomechanics, Drexel University, USA, ***Dr. Catherine Von Reyn***, Neural Circuit Engineering Drexel University, USA, ***Dr. N. Kumarappan***, Chairman, IEEE Madras section, ***Dr. G. S. Bhuvaneshwar***, Consultant Medical Devices, Former Head, BMT, SCTIMST and ***Mr. R. Balamurugan***, Sr Vice President, HCL Technologies, Chennai were invited as guests of honour for the inaugural function.

DEPARTMENT VENTURES

CHIEF GUESTS AND GUESTS OF HONOUR

Dr. Hasan Ayaz, is an Associate Professor at Drexel University, School of Biomedical Engineering, Science and Health Systems, Philadelphia, PA and in the Department of Psychology at the Drexel University College of Arts and Sciences, a core member of the Cognitive Neuroengineering and Quantitative Experimental Research Collaborative and with affiliations at the University of Pennsylvania and the Children's Hospital of Philadelphia.

Dr. Catherine von Reyn, assistant professor in the School of Biomedical Engineering, Science and Health Systems at Drexel University

Dr. Sriram Balasubramanium, Associate Professor at School of Biomedical Engineering, Sciences and Health systems in Drexel University, USA.

Dr. G. S. Bhuvaneshwar an independent Consultant in Medical Device design, development, testing and Quality management. He is an Adjunct Professor in the Department of Engineering Design at the Indian Institute of Technology, Madras.

Dr. N. Kumarappan, IEEE Madras Section Chairman,Professor Department of Electrical Engineering, Faculty of Engineering and Technology, Annamalai University.

Mr. Balamurugan, Vice President HCL Technologies, Chennai

DEPARTMENT VENTURES

KEYNOTE SPEAKERS

DAY 1:

Day 1 conference had one chief guest, five guests of honour on inauguration session, followed by paper presentation and two keynote speakers from Czech Republic.

SESSION 1:

Dr. Jan G. Svec, Associate Professor, Department of Biophysics, Palacky University Olomouc, Czech Republic; Associate Research Scientist, Voice and Hearing Centre, Prague, Czech Republic gave a talk on "Physiology and Acoustics of Human Voice".

SESSION 2:

Dr. Barbara Zitova, HOD, Department of Image Processing, ÚTIA AV ČR, Prague, Czech Republic, delivered a talk on the topic "Medical imaging in computer aided diagnosis, focused on voice therapy".

DAY 2:

Day 2 had four keynote speakers from various fields and universities, with Paper presentations.

SESSION 3:

Dr. Sudhir Ganesan, Ortho Spine Surgeon, SRIHER, Chennai, delivered a talk titled "The Prospects of Engineering in Medicine –A Spine Surgeon's Perspective".

SESSION 4:

Dr. M. Murugappan, Associate Professor, Department of Electronics and Communication Engineering, Kuwait College of Science and Technology, Doha, Kuwait gave an effective talk on "Affective Computing Applications in Healthcare".

DEPARTMENT VENTURES

SESSION 5:

Dr. S. Kailash, Associate Professor, Department of Psychiatry, Chettinad Hospital and Research Institute, delivered a talk on "Brain stimulation methods in psychiatry".

SESSION 6:

Dr. Hugo Gamboa, Associate Professor, Physics Department of the Sciences and Technology Faculty of the Universidade Nova de Lisboa, gave a talk on "Making Sense of Bio signals".

DAY 3:

The final day of conference had three keynote speakers from different universities, Paper Presentation and Valedictory session handled to two guests holding senior positions in various memberships and organizations.

SESSION 7:

Dr. Deepak Joshi, Assistant Professor, Centre for Biomedical Engineering, Indian Institute of Technology, Delhi, gave an insightful talk on "Biomechanics and Rehabilitation".

SESSION 8:

Ms. Jesin James, Lecturer, Department of Electrical, Computer, and Software Engineering at the University of Auckland, New Zealand, delivered a talk on "Languages and emotions: Towards speech technology development for under-resourced languages and secondary emotions".

DEPARTMENT VENTURES

SESSION 9:

Dr. Justin Dauwels, Associate Professor, Circuits and Systems (CAS), Department of Microelectronics, Delft University of Technology, Netherlands gave a talk on the topic "Artificial Intelligence for Applications in Neurology".

Participants from other institutions presented their research work in the paper presentation forum which happened in the course of three days.

ICBSII 21 stays unique by receiving more than 200 papers and about one third were accepted for publication. ICBSII 21 had proud moments by arranging abroad university speakers, and wonderful presentations by abroad participants.

DEPARTMENT VENTURES

DRDO- LSRB Project Review Meeting

The review meeting for the LSRB sponsored project titled, "Design and Development of Biosignal Controlled Hand Exoskeleton", was held on 6/03/21 at 11.00 am through online mode.

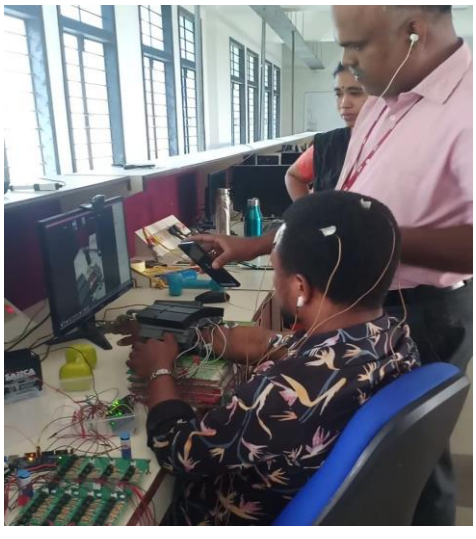
The progress of the sanctioned project and the outcomes of various quarterly objectives was explained. The hardware design of the Exoskeleton was well appreciated and possible enhancement with applications for radiologists was also discussed. The review committee was convinced about the EMG acquisition and agreed to the fact that involving EEG in controlling the device is always tricky. They also appreciated the level of functioning of the exoskeleton with both the components considered for processing the control signal.

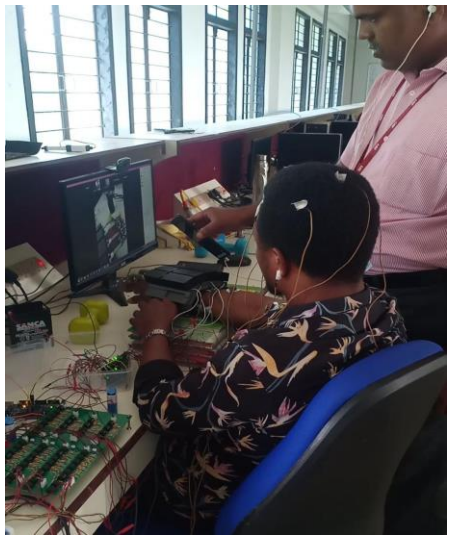
Project Members present

- Dr. A. Kavitha (PI)
- Dr. S. Bagyaraj (CO-PI)
- Ms. R. Nithya (CO-PI)
- Ms. S. Sindhuja Mary (JRF)

DRDO- LSRB Review Members present

- Mr. K. Mohanavelu –DEBEL, DRDO
- Mr. Karthick –DEBEL, DRDO
- Mr. Vijayakumar –INMAS, DRDO





DEPARTMENT VENTURES

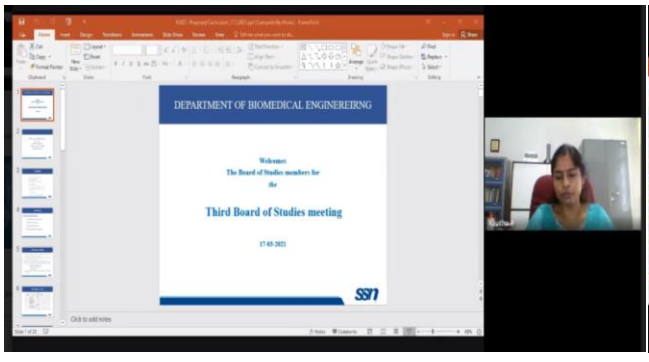
The work also featured in DRDO Defence Express:

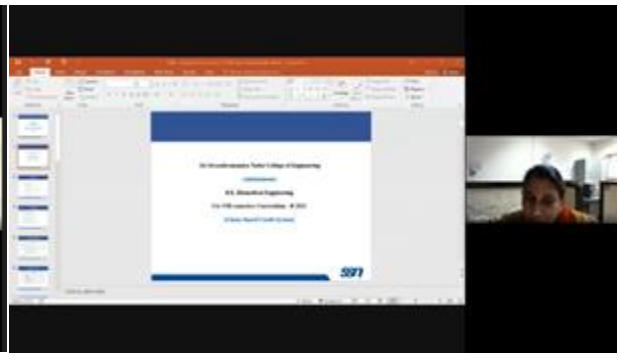
(Representative image)

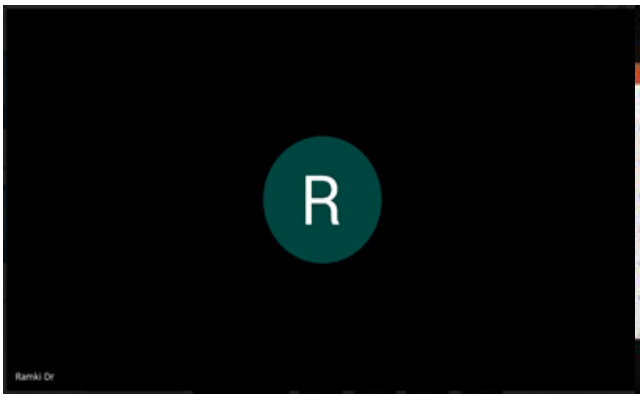
DEPARTMENT VENTURES

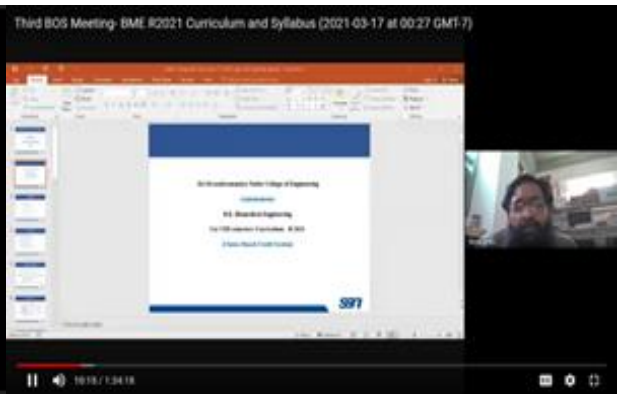
BOARD OF STUDIES: MEETING FOR R2021 CURRICULUM AND SYLLABI APPROVAL

The department of Biomedical Engineering conducted the Third Board of Studies virtual meeting on 17.03.2021. The proposed curriculum and syllabus for all the semesters of B.E Biomedical Engineering under Choice Based Credit System, to be offered under autonomous status R-2021 was discussed and approved during the meeting. **Dr. A. Kavitha**, Professor & Head, Chairman, Prof. S. Ramakrishnan, Professor & Head, Biomedical Engineering Division, Department of Applied Mechanics, IIT Madras, Chennai, Prof. Renu John, Associate Professor &Head, Department of Biomedical Engineering, IIT Hyderabad, Dr. C. M. Sujatha, Associate Professor, Department of ECE, CEG Campus, Anna University, Chennai, Ms. S. Sivaranjani, Research Scholar, Department of ECE, CEG Campus, Anna University, Chennai Meritorious Alumnus and Faculty members were present. Dr. A. Kavitha, head of the department presented the curriculum gap identified in R2018 and the salient features of R2021. She also discussed the credit distribution under each category and the comparison with the R2018. All the Faculty members of the Biomedical Engineering department presented the syllabus framed under each domain expert group. The BOS members appreciated the inclusion of the Engineering Fundamental Practice concept in the curriculum.









DEPARTMENT VENTURES

Vice Chancellor, SNU Chennai - Visit to Department of BME

Dr. Sriman Kumar Bhattacharya, the VC of SNU visited the department on 15th March, 2021, to know about the research activities of the Department. Dr. A. Kavitha presented the research highlights of the department. He was then escorted to different labs in the department to see the projects kept for display and demo. Various projects that received patents, won prizes in competitions and fundings were demonstrated by the faculty and students of the biomedical department.

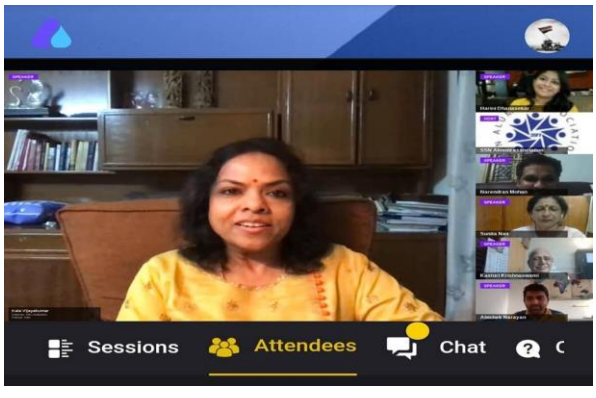
The VC of SNU- Dr. Bhattacharya - Visiting department of BME

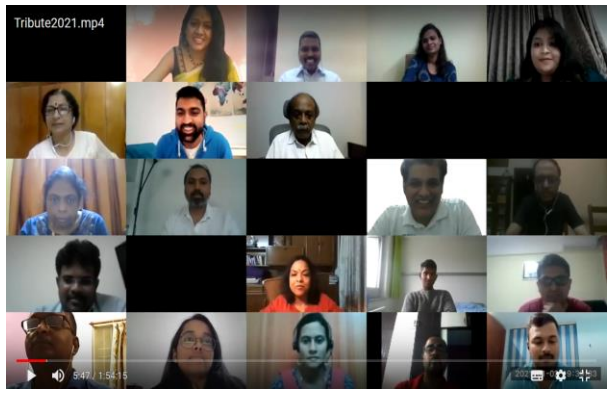
ALUMNI MEET

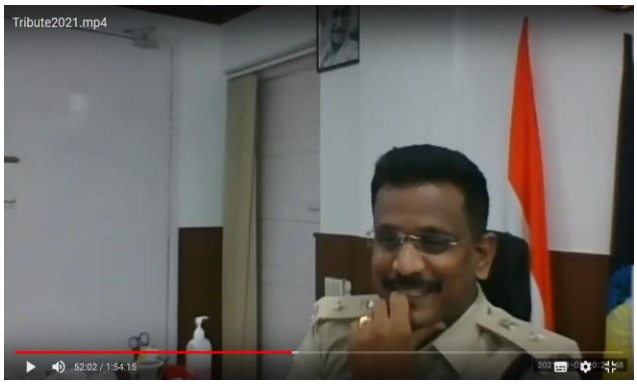
Tribute 2021 - Annual alumni meet held on January 2nd, 2021, gave an opportunity to reach out more alumni across geography to the meet by going virtual this year due to the prevailing pandemic. The alumni from past batches shared their valuable experiences and career paths. Many friends got together in this online meet and it was a nostalgic and memorable experience for everyone.

Tribute 2021 started with a welcome address delivered by **Dr. Kala Vijayakumar, President, SSN Institutions**. Followed by, the Alumni from Government Civil services shared their journey on how they strived hard to prepare for the exams and SSN's part in shaping them as a person. Karthik K, IPS - Batch of 2008, Poornima Pandian, IFS - Batch of 2011 and Sowmiya Ammaiyappan, IRS - Batch of 2016 were some of the notable alumni in the meet who cleared the civil services exams and are now serving for the Government of the nation. They also shared how they were able to crack all the challenges that came through their way to reach this position. Mythily Sarathy - Batch of 2008, Radhika Ravi - Batch of 2011 and Sathyamoorthy - Batch of 2004 are a few remarkable alumni of SSNCE now pioneers in the HR department. The alumni from the HR Panel gave tips on how to grab opportunities during the crisis. The success of the alumni of SSNCE is not restricted to only the fields of engineering or management. SSN has left its footprint in the entertainment space as well. Aswath, Director, Oh! My Kadavule - Batch of 2011, Pradeep Ranganathan, Director, Comali - Batch of 2015, celebrated alumni who have achieved their dreams in the cinema industry, shared their journey as well. They recalled how participating in the events organized by various clubs at SSN helped them realise their dreams and provided them with a platform for them to showcase their talents. These humble beginnings served as a means for them to spread their wings and grow in their chosen industry. A memorable thank you note delivered by Dr. Sunitha Nair, Student Affairs, SSN Institutions marked the end of the nostalgic event.

A few shots from the main meet…

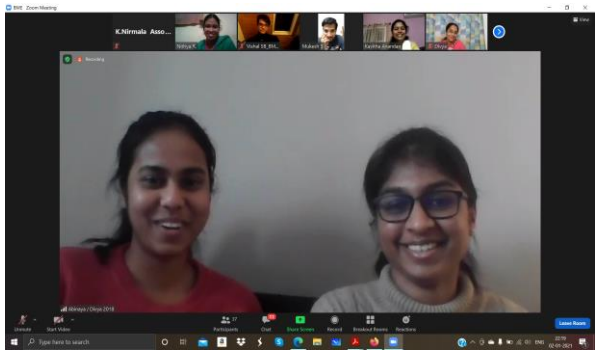


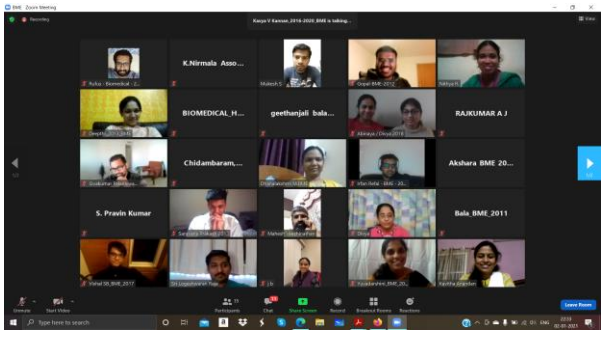


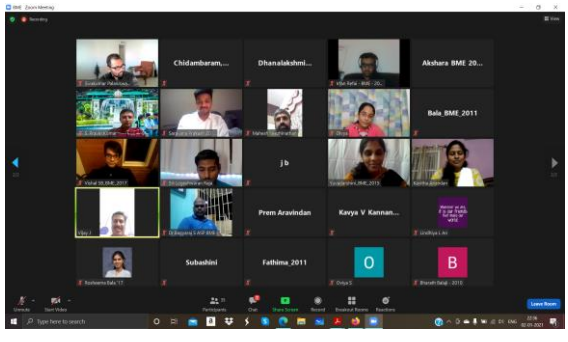


After the main event came to a close, there was a small department specific meet conducted by the Department of Biomedical Engineering. Sivakumar (2011), an entrepreneur and the winner of the first ever 'Distinguished Alumni Award' was a part of the meet. Rajanadhinit(2010), Irfan(2012), Yuvadharshini(2015), Saravana Prakash(2016), Vishal (2017), Abhinaya(2018) and Divya(2018) are some of the alumni pursuing their career in biomedical research while Barath balaji (2010), Gopalakrishnan and Mukesh(2012) went on to become biomedical faculty in various colleges and universities. Sri Logeswaran(2013) and Deepthi(2013) are a few notable biomedical engineers. In the other fields are Pragadesh(2018), an IT professional, BalaSubramaniam(2011), a businessman and Rufus(2011) in the HR department. All of them nostalgically recalled their memorable moments in the department and also shed light on their journey in their specified fields.

A few shots from the department meet…







ALUMNI PURSUIT

Deepika R, an alumna of our college, completed her B.E. in Biomedical Engineering from SSNCE in 2017. She went on to do her post graduate diploma in liberal studies from Ashoka University in 2018. She is now a senior project associate at International Innovation Corps (University of Chicago Trust).

Right from her time in college she has been passionate about AI, VR and AR, having done an internship on the same at XR Labs as a business strategist where she performed extensive market research and generated 250 plus new leads across industries for the AR and VR solutions at its launch stage. She is currently working with the ministry of electronics and IT (MeitY) in drafting their artificial intelligence policy. She has also published several papers on 'Late Capitalism and Mental Health'.

In her time consulting with the Indian government's policy think tank - NITI Aayog - on its flagship initiative, the Women Entrepreneurship Platform, her team worked extensively on ensuring that the program was designed to serve businesswomen from tier-2 and tier-3 cities of India. This was done through offline city chapters as well as a website design that could be accessed at 2G internet speeds ensuring that the penetration of the program didn't stop with the ultra urbanised sections.

In this high-stake project, she had the opportunity to work closely with some of the leading experts in the Indian gender space to create a conducive environment for improved female labour force participation. The evolution of the platform and the learnings from this project have been captured through this report that was published on Women's Day 2021 to mark the three-year anniversary of the platform.

Deepika R (2017 ALUMNI)

ALUMNI PURSUIT

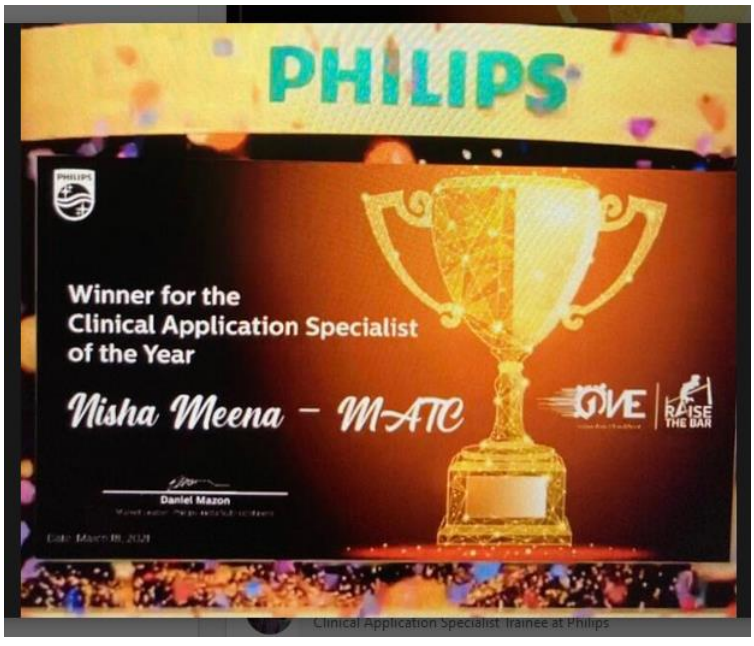
Swetha Sridharan, a Biomedical Engineer, Graphic Designer and Artistic Branding Consultant, completed her biomedical engineering from SSNCE in 2013. During her time in college, she did an internship at Pricol Medical Systems in Coimbatore where she worked on the development of 5-Lead ECG module in the Multiparameter Monitor in the R & D department in 2011 and another internship at Aries Biomed Technology again in Coimbatore where she worked on two projects in the R and D department- Development of JIG- Lung Module Analyzer using Aesthetic LabVIEW and Development of Standalone EtCO2 Module- Capnography.

Apart from academics, she was also the placement coordinator and also a member of the Youth Red Cross and Innovation Cell and is now a Student Alumni Representative. She then went on to work at Amplitude-Ortho for 3 months where she was actively involved in the design & development activities related to orthopedic implants with Amplitude France and in the design & development of patient specific instruments which include conversion of 3D bone models (of lower limbs i.e., hip femur, knee femur, knee tibia and ankle tibia with ankle fibula) from 2D images (CT/MRI) using MIMICS to create customized surgical instruments using 3-MATIC.

She also worked to assign the landmarks on bones to design the customized instrument using Materialize's 3-MATIC and create customized surgical guide pins that will be used in actual surgery using Materialize's 3-MATIC. She also worked at Siemens Healthineers as a Technical Trainer for Channel Partners and Sales Support for over 2 years. After completing. Artpreneur Program in Graphic Design and Artistic Branding in 2019, she is now a freelance graphic designer at Atma Studios. She provides services such as Graphic Design, Logo Design, Visual Design, Brand Marketing, Illustration, Packaging Design, UX Research, Print Design, Web Design, and Brand Design.

ALUMNI PURSUIT

Meena Nisha, Clinical Application Specialist at Philips, India an alumna of our college, completed her B.E. in Biomedical Engineering from SSNCE in 2018. Won the "**Clinical Application Specialist of the Year 2020**".



Meena Nisha • 2nd
Clinical Application Specialist at Philips
3w • Edited •

Being in the #MATC modality in #PhilipsIndia, I knew I would inevitably have to go into Covid-ICU's at one point for my demos & trainings. While that thought was enough to give me anxiety, I was reminded by my family of a beautiful quote from one of my favourite books from my childhood ,"You are braver than you believe, stronger than you seem and smarter than you think".

By the end of August & till the reminder of the year, it was back to back work in hospitals and covid wards. I've learnt prayer & the massive support of your team & family, goes a long way. I do not know how, but those few months in 2020 were some of the enriching, creatively uplifting and simply put, the best months in my job. Philips was my first company & my first work family since graduating college in 2018. When I attended the kick-off awards night in 2019, I just hoped I would be just as eligible to be nominated for the "CAS of the year" someday in the future. While back then it was merely a passing thought, yesterday I was humbled to receive this recognition from my company.

It would not have been possible without the support from my Sales team & CAS team. A huge thank you to my mentors & everyone involved in helping me grow since Day 1. It would have been just a dream if not for all of you.

ALUMNI TALK

The Department of Biomedical Engineering of SSN had organized "PathFinder 2021- An Alumni Talk on Career guidance" the first session of which was conducted on the 13th of March, 2021.

The first speaker, Ms. Meghna Murali, completed her biomedical engineering from SSN in 2019. From then she went on to pursue her MS in biomedical engineering at Brown University, with a specialization in medical device product development.

She took the students through her education and career and motivated them to keep working on their ideas no matter how small they were. Having worked on various projects and published several papers, one of which was presented at the ICBSII conference 2019, she is a firm believer that students should always be open to new ideas and learning new concepts. She asked the students to never limit themselves as it is only if we keep striving that we can achieve what we aspire in life.

She mentioned how she worked on different projects right from her first year in UG and how students must also start investing time in such projects in order to get maximum exposure and knowledge about how they work. She is now set to work for Massachusetts General Hospital in Boston, which is one of the most prestigious and the third oldest hospitals in the US.

Her glowing career was truly inspirational and her words encouraged the young minds to believe that they too could achieve greatness in life if they put their heart to i

FACULTY VENTURES

RECOGNITION

Dr. B. Geethanjali, acted as an external doctoral committee member for Ms. Madhavi Kemidi external part time candidate registered under Dr. Diwakar R. Marur, Associate, Professor, Electronics and communication Engineering Department, SRM Institute of Science and Technology (SRMIST), Kattankulathur

Dr. S. Arun Karthick, attended the Second Doctoral Committee Meeting for the scholar Mr. Krishnakumar S, Reg no.19154991172 working under the guidance of Dr. Jobin Christ, Professor, Rajalakshmi Engineering College, Chennai during Feb 6 2021.

Dr. S. Bagyaraj, ASP/BME, as a expert member attended the DC meeting of Research Scholar Ms.Muthamil B Ph.D scholar registered at SRM Institute of Science and Technology on 18th February 2021

Dr. S. Bagyaraj, ASP/BME, as member attended the DC meeting for the Research Scholar Mr.Seeni Mohamed Aliar Maraikkayar SM Ph.D scholar registered at Anna University on 03.02.2021

Dr. B. Geethanjali AsP/BME delivered guest talk on the topic "LabVIEW as a Tool for Biomedical System Design for National Level Workshop on LabVIEW and Its Applications in Healthcare "on Jan. 30, 2021 from 8.45 am to 9.45 am organized by Dept. of BME, SSN CE

Dr. S. Bagyaraj, ASP/BME, as DC member attended the Comprehensive Viva Voce of PhD candidate Ms. V. Akila Ph.D scholar registered at SRM Institute of Science and Technology on 25.02.2021

Dr. S. Bagyaraj, ASP/BME, As Expert member attended the first DC meeting of Mr. Harikrishnan.S. (RC2113011011001) Ph.D scholar registered at SRM Institute of Science and Technology on 03.02.2021

Dr. Vijay attended the first Doctoral Committee meeting for Ms Devaki, full time scholar of Dr. Jayanthi T, SRM University on Feb 10, 2021.

Dr Vijay J, attended the First Doctoral Committee meeting for Mr. Renjith P K, Part-Time scholar of Dr. Manohari R, SRM University on Feb 12, 2021.

Dr. S. Bagyaraj, ASP/BME, as External Expert attended the Ph.D confirmation Doctoral Committee Meeting of Mr. Jaison Jacob Mathunny (RA1913011011003) Ph.D scholar registered at SRM Institute of Science and Technology held on 6.02.20.

FACULTY VENTURES

Dr Vijay J attended the First Doctoral Committee meeting for Ms. Jenifer T, full time scholar of Dr. Rajalakshmi T, SRM University on Feb 11, 2021.

Dr. J. Vijay has been honored as Technical Committee member for 2021 IEEE Fourth International Conference on Microelectronics, Signals & Systems, organized by TKM College of Engineering, Kollam, India during November 18-19, 2021.

Dr. Mahesh Veezhinathan, Associate Professor, Gave a Talk as a Guest speaker in International Conference on Applied Mathematics & Civil Structures (ICAMCS 2021) jointly organised by the Department of Mathematics and Department of Civil Engineering, Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam, on February 13, 2021

Dr. L. Suganthi attended the third mentoring session with Dr. Bhuvaneshwar for the project “Immersive VR based Hi-fidelity Digital

Dr. S. Bagyaraj, ASP/BME delivered a guest lecture on “Innovations in Neurotechnologies for BCI Applications” at the department of ECE, Sethu Institute of Technology, Kariapatti, on 27.01.2021.

Dr. S. Bagyaraj, ASP/BME delivered an invited talk on “Functional Near Infrared Spectroscopy: A Promising Neurotechnology for Brain Computer Interface applications" in AICTE sponsored Two Weeks FDP on Machine Learning Techniques for Imaging and Healthcare with Python at the department of EIE, Sri Sai Ram Engineering College, Chennai on 29.01.2021.

Dr. Mahesh Veezhinathan, Associate Professor, Gave a Talk as a Guest speaker in INTERNATIONAL CONFERENCE ON APPLIED MATHEMATICS & CIVIL STRUCTURES (ICAMCS 2021) jointly organised by the Department of Mathematics and Department of Civil Engineering, Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam, on February 13, 2021.

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FACULTY VENTURES

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Dr. J. Vijay ASP/BME has been honored as Advisory member for DST sponsored National Conference on National Virtual Conference on Advanced Informatics, Electronics and Vision, organized by Dr. Mahalingam College of Engineering and Technology, Coimbatore, Tamil Nadu

Dr. S. Bagyaraj, ASP/BME delivered a invited talk on “fNIRS: A Promising BCI Technique” in AICTE Sponsored Two Weeks Faculty Development Programme on Machine Learning Techniques for Imaging and Healthcare With Python (Online Mode) Phase-II at the department of ICE, Sri Sai Ram Engineering College, Chennai on 18.03.2021.

Dr. L. Suganthi, has registered a LLP start up along with EEE students Sriram shreedharan, vignesh R, vikram A S on 19.03.2021

Dr. S. Pravin Kumar as a Doctoral Member, attended the Comprehensive Examination of Mr. Gowrishankar G, held at VIT University, Chennai, on 3.3.21

Dr. A. Kavitha HoD/BME gave a keynote lecture on the title "Medical imaging in Neuronal disorders" at Bharath University on 19th March 2021, in ICRABE 2021.

Dr. A. Kavitha HoD, attended BoS committee meeting at Adhiyamaan College of Engineering on 31 March 2021.

Dr. Mahesh Veezhinathan gave a guest talk on "Insight to National Innovation Policy" on 6th Jan. 2021. Organized by Institution Innovation Council, SSN.

Dr. S. Pravin Kumar delivered an invited talk on "Image Processing and Computer Vision Applications for Voice Disorders" in AICTE Sponsored Two Weeks Online FDP on "Computer Vision & Image Processing: Research Issues, Innovation and Application" – Phase-I Conducted by the Department of Electronics and Communication Engineering, PSNA College of Engineering and Technology, Dindigul on 12.01.2021.

Dr. S. Pravin Kumar delivered a invited technical talk on "LabVIEW for Biomedical Signal Acquisition and Processing" in National Level Workshop on LabVIEW and Its Applications in Healthcare, organized by Department of Biomedical Engineering, SSN College of Engineering, Chennai, on 29.01.2021

FACULTY VENTURES

Workshop/Seminar/FDP/Seminar/Training/Webinar Organized

Dr. S. Arun Karthick, Dr.S. Bagyaraj and **Dr. J. Vijay** have successfully conducted the Two-Day Virtual workshop on "Biomedical Applications using Nanotechnology" on 20-21 Jan 2021.

Dr. V. Mahesh and **Dr. B. Geethanjali** have successfully conducted Two Day National Level Workshop on LabVIEW and Its Application in Healthcare during 29-30 Jan. 2021.

Dr. S. Pravinkumar, IEEE EMBS co-organized the "Space Biology" workshop by Aviseka Acharya, University of Cologne in INVENTE 5.0 on 23.01.21.

SSN IEEE EMBS organized the “Brainstorming Session”, which was an interactive event for the first year BME students of SSN College of Engineering about different domains and opportunities in BME on 6th February 2021, Student Coordinators: Varsha Seshadri, Rebecca Maria G and Ansar Ahamed. Faculty Coordinator: **Dr. S. Pravin Kumar**.

Dr. J. Vijay & **Ms. R. Nithya** organized a one-day workshop on "Mentorship Session for Innovators", along with Institutions Innovations Council on February 06, 2021.

Dr. S. Bagyaraj & **Dr. S. Arun Karthick** have successfully conducted Two Day Workshop on Neurofeedback & Biofeedback Devices during Feb 22-23, 2021, in Collaboration with Gunjan Human Karigar Pvt.Ltd., New Delhi.

Dr. L. Suganthi, **Dr. K. Nirmala**, & **Ms. B. Divya** conducted a webinar organized by HTIC Medtech Incubator on the title "BIG Awareness Session” on Feb 26th (Friday), 2021 in association with IIT Hyderabad, Kongu Engineering College, & Acharya Nagarjuna University via Google Meet.

Dr Vijay Jeyakumar, has hosted an event titled "How to ace your summer Internship" along with Internshala ('internship partner of AICTE") on March 13, 2021.

Dr. E. M. Malathy Associate professor/IT, **Dr. S. Arun Karthick** Associate professor, BME & **Dr. L. Suganthi,** Associate professor, BME along with the Industry IELEC SYSTEMS have successfully conducted two-day online training on PIC Microcontroller during 4-5 March 2021.

Dr. E. M. Malathy Associate professor, IT Dept. **Dr. L. Suganthi**, Associate professor and **Dr. S. Arun Karthick** Associate professor, BME Dept organized two-day online Training on ARM Microcontroller along with the company IELEC SYSTEMS on 29.03.2021 and 30.03.2021.

FACULTY VENTURES

Workshop/Seminar/FDP/Seminar/Training/Webinar Attended

Dr. S. Arun Karthick has attended one day Webinar on “Electron Microscopy-X Symposium” organized by Stanford University on 4.01.2021.

Ms. B. Divya attended a webinar on the topic, "Demystifying National Education Policy 2020" on 05.01.2021 at 10.30 a.m. by Dr. N. Bhalaji, Associate Professor, IT, SSNCE.

Ms. B. Divya attended a webinar on the topic, "Insights to National Innovation & Start-up Policy 2020" on 06.01.2021 at 09.30 a.m. by Dr. V. Mahesh, Associate Professor, BME, SSNCE.

Dr. Mahesh Veezhinathan has attended Orientation Cum Training Session (1st) on NISP (2nd Phase) on 11th Jan.2021 and Session 2 on 29th Jan.2021.

Dr. A. Kavitha attended One Week Instructor Led Live Online Training on Deep Learning Using Medical Data held during 08 - 12 February 2021, organized by Finland Labs (A Unit of Revert Technology Pvt. Ltd.).

Dr. B. Geethanjali attended Two-day Workshop on “Assistive Technology – The Challenges” organizedby the Departmentof Electronics & Communication Engineering, Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam, Chennai, Tamil Nadu, from 15-16th February 2021.

Dr. A. Kavitha attended a workshop on "Gamma-Inducing Brain Stimulation in Alzheimer’s Disease and Related Dementias" on 23.2.2021

Dr. K. Nirmala attended a Two-day Workshop on "Neurofeedback and Biofeedback Devices" during 22-23 Feb 2021

Ms. R. Nithya has attended two-day Workshop on “Assistive Technology - The challenges" organized by Department of ECE, SSNCE on 15.02.2021 & 1602.2021.

Ms. Divya B has successfully completed One Week Instructor Led Live Online Training on Deep Learning Using Medical Data held during 08 - 12 February 2021Organized by Finland Labs (A Unit of Revert Technology Pvt. Ltd.).

FACULTY VENTURES

Dr. J. Vijay and **Ms. Divya B** attended two-day ISO - Internal Auditor training programme from February 24th - 25th, 2021. The training was given by Mr. Bhaskar, TUV NORD Training Academy.

Dr. Mahesh Veezhinathan, **Dr. S. Bagyaraj** and **Dr. J. Vijay** has attended Two Day Workshop on Assistive Technology - The Challenges, Organized by Dept. of ECE, SSN CE during 15-16 Feb. 2021.

Dr. Mahesh Veezhinathan attended a National Level Webinar on Designing AI for the IoT Systems on 18th Feb 2021(Thursday) from 10am to 12noon being organized by NITTTR, Chennai in association with Optithought.

Dr. Mahesh Veezhinathan attended a webinar on Strategies for Innovating with PepsiCo" on Wed, Feb 17, 2021 9:30 PM - 10:15 PM IST.

Dr. R. Subashini attended Two-day workshop on “Medical Devices Entrepreneurship, Intellectual Property Rights and Patents” at Department of Biomedical Engineering, School of Bioengineering, College of Engineering & Technology, SRMIST, Kattankulathur-603203 on 18.02.2021 and 19.02.2021.

Dr. R. Subashini attended a webinar on "BIG Awareness Session” organized by HTIC Medtech Incubator in Association with IIT Hyderabad, Kongu Engineering College, SSN College of Engineering, Acharya Nagarjuna University & MNNIT. on 26.02.2021.

Dr. L. Suganthi attended the 15days Executive Development programme in "society 5.0" Conducted by Sathyabama Institute of Science and Technology, Chennai, Tamil Nadu from 1.03.2021 to 17.3.2021.

Dr. J. Vijay has attended NAAC sponsored Two-day National seminar on "Enhancing Quality Teaching Strategies through Outcome based Education" held during March 02 - 03, 2021, organized by Dept. of EEE & IQAC, Kongu Engineering College, Erode.

Dr. S. Arun Karthick has attended one day National level workshop on “RESEARCH DOCUMENTATION - LATEX” organized by Department of Computer Science and Engineering under the auspices of IEEE / IEI / ACM / CSI / IIC Student chapters, Sri Sivasubramaniya Nadar College of Engineering on 06, March 2021.

Dr. S. Arun Karthick has attended one day Webinar on “Stanford Electron Microscopy-X Symposium” organized by Stanford University on 1 March 2021.

Dr. B. Geethanjali has participated in the e-workshop on Basic to Advance of SPSS held from March 13 -14 March 2021, organized by Research Smiths.

FACULTY VENTURES

Dr. Sachin Gaurishankar Sarate has attended a 2 weeks Faculty Development Program sponsored by Department of Science and Technology (DST) conducted by IITM HTIC Medtech Incubator virtually from 08-03-2021 to 20-03-2021.

Dr. S. Bagyaraj has attended one day Webinar on "IEC 62353 compliant Electrical safety testing for patient monitors and ventilators part 1" organized by Fluke Biomedical on 15.03.2021.

Dr. S. Bagyaraj has attended one day Webinar on "IEC 62353 compliant Electrical safety testing for patient monitors and ventilators part 2" organized by Fluke Biomedical on 16.03.2021.

Dr. K. Nirmala has attended two days of online workshop on "Image classification using deep neural networks" organized by Department of Information Technology, SSNCE on 11-12 March 2021.

Journal Publications

Bagyaraj S, Arun Karthick S*, Gomathi S, Sandini S, Sowmiya R, Devi B & Vaithiyanathan D, "Preparation and Characterization of Silver Nanoparticle/Aloe Vera Incorporated PCL/PEO matrix for wound dressing application"**,** Indian Journal of Biochemistry & Biophysics, Vol. 58, No. 1, 35-44, Feb 2021.

Devi Baskar, Gobi Nallathambi, **Arun Karthick Selvam**, P. Senthil Kumar, "Preparation of PAN/lycopene-TiO2 nanocomposite membrane for azo dye degradation" Desalination and Water Treatment, Vol.216, 436–444, March 2021.

Conference Publications

Dr. B. Geethanjali presented a paper titled Design and Development of EMG based Communication Aid for People Affected with Amyotrophic Lateral Sclerosis (ALS) at the INTERNATIONAL CONFERENCE ON APPLIED MATHEMATICS & CIVIL STRUCTURES (ICAMCS 2021) jointly organised by the Department of Mathematics and Department of Civil Engineering, Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam, on February 12 -13, 2021

Dr. S. Arun Karthick presented a paper entitled Cerium oxide nanofibres by electrospinning technique for photocatalytic degradation under visible light Irradiation in the 6th International Conference on Nanoscience and Nanotechnology organized by SRM Institute of Science and Technology, Kattankulathur during Feb 1-3, 2021.

FACULTY VENTURES

Dr. S. Arun Karthick presented a paper entitled Preparation and characterization of Injectable Nano Hydroxyapatite as Bone Substitute in the INTERNATIONAL VIRTUAL CONFERENCE ON DRUG DISCOVERY & TRANSLATIONAL RESEARCH - DDTR -2021 organized by PONDICHERRY UNIVERSITY during Feb 25-26, 2021.

Dr. Mahesh Veezhinathan presented a paper entitled Design of IoT Based Diagnosing Tool for Rural Population in two-day International Conference on Applied Mathematics Civil Structures organized by SSN during Feb.12-13, 2021.

Ms. M. Dhanalakshmi presented a paper titled "An external aid for Amyotrophic Lateral Sclerosis (ALS) and Drooping Head Syndrome (DHS) patients" in the International Conference on Advances in Smart Sensor, Signal Processing and Communication Technology (ICASSCT 2021) organized by the Department of Electronics, Goa University, Goa, India during 19 - 20, March 2021.

Dr. S. Pravin Kumar presented a paper entitled MEASUREMENT OF Q FACTOR FROM TWO DIMENSIONAL IMAGES OF OSTEOARTHRITIC KNEE BRACES at Medical Imaging and Computer-Aided Diagnosis (MICAD2021), conducted by Japanese Association for Medical Artificial Intelligence (JMAI), Birmingham, UK, during March 25-26, 2021.

Dr. S. Arun Karthick and M. Gundhavi Dev “Fabrication of collagen/platelet rich plasma/Ag nanocomposite for wound healing applications”, International Virtual Conference on Futuristic Research in Nanotechnology, Faculty of Allied Health Sciences, Chettinad Academy of Research and Education, Chennai, India during 25 March 2021.

Dr. S. Arun Karthick, Anjana Anand, Harshini Ramaswamy, and Prasidha Prabhu, “Green Nanocosmetics: A Futuristic Approach” at International Virtual Conference on Futuristic Research in Nanotechnology, Faculty of Allied Health Sciences, Chettinad Academy of Research and Education, Chennai, India during 25 March 2021. (Won Best Poster Award)

Patents filed

Dr. L. Suganthi, Anupam Bhaskar bhatta, Prem Aravindan J, Kesavaraj V along with Varun Durai S I (Verena Haptic & VR Systems Pvt Ltd) filed patent on High Fidelity Digital Rectal Examination with Haptic Feedback which is published on 12/02/2021.Patent application number:202141003662.

Dr. L. Suganthi filed form 1 for the invention titled “Immersive VR based High Fidelity Digital Rectal Examination setup with Haptic Feedback” to CIntelligence Services Pvt Ltd on 27.01.2021.

FACULTY VENTURES

Projects Applied

Dr. R. Subashini, applied for the project titled "Orthopaedic belts using Sodium Acetate crystals to DBT-ATGC scheme" with a Total budget of 27.55L on 27.2.2021.

Dr. A. Kavitha, Dr. S. Pravin Kumar, Ms. B. Divya and Dr. S. Vidhusha presented their proposal titled ""Learning Online based on Human Computer Interaction and Biosignals - LeBIOS" to the committee members submitted under International Cooperation (Bilateral) Division under Call for India Portugal Joint Proposal Scheme on 21 Jan 2021.

Dr. S. Arun Karthick (PI) & **Dr. S. Bagyaraj** (Co-PI) submitted a project titled "Functionalized Mask using Nanofibrous Nonwoven for filtration against Aerosol, Bacterial and Chemical Agents" with a Total Budget of Rs.25,15,832/- to SERB-CRG.

Dr. R. Sundareswaran (PI) & **Dr. V. Mahesh** (Co-PI) submitted a project titled "Experimental validation of Neuropathy for assessing Diabetic based on graph theoretic approach using centrality measures" with a Total Budget of Rs.19,40,000/- to SERB.

Dr. R. Subashini submitted a project titled "Anticancer drug discovery from the lead phytomolecules of Cassia auriculata: A green anticancer approach" to DST SERB -CRG with the cost of Rs.46,61,800/-.

Dr. A. Kavitha and **Ms. Divya B** along with Dr. A. R. Jac Fredo (Assistant Professor, School of Biomedical Engineering IIT (BHU)) submitted a proposal titled "Virtual Reality based training for Neurodevelopmental Disorders" to Innovative and Entrepreneurial Project Proposals Under Technology Incubation Hub (TIH) for Data Analytics and Predictive Technologies (DAPT).

Dr. S. Pravin Kumar, **Dr. A. Kavitha** and **Ms. Divya B** submitted a proposal titled "Connected homecare" to Innovative and Entrepreneurial Project Proposals Under Technology Incubation Hub (TIH) of National Mission on Interdisciplinary Cyber Physical Systems (NMICPS) for Data Analytics and Predictive Technologies (DAPT).

PhD Scholar Updates

Ms Subashri C K (21233991224) has enrolled for PhD (Part-time mode) in Anna University under the supervision of **Dr J. Vijay.**

Ms. Gundhavi Devi M (21234991555) has enrolled for PhD (Full-time mode) in Anna University under the supervision of **Dr. S. Arun Karthick.**

G. Selvendran (2112491309) has enrolled for PhD (Part-time mode) in Anna University under the supervision of **Dr L. Suganthi.**

FACULTY VENTURES

Dr. J. Vijay convened first Doctoral Committee meeting for his Research Scholar Ms. Subasri T, (Part-Time) on Feb 26, 2021 through Google Meet.

Dr. S. Arun Karthick convened the first Doctoral Committee meeting for his Research Scholar Ms. Gundhavi Devi M (Reg:21234991555, Full-Time) on March 3, 2021 through online via Zoom platform.

Book Chapter Published

Devi Baskar, **Arun Karthick Selvam**, "Biosynthesis of Nanoparticles using Microorganisms", In Microbes for a Sustainable Environment and Human Welfare: Advancements and Opportunities, Chapter 4, Nova Science Publishers, Jan 2021. ISBN: 978-1-53619-062-5 (Hardcover).

Jeslin Libisha **J, L. Suganthi, B. Divya,** "SoC Implementation Using FPGA for ECG Signal Analysis" in the book Emerging Research in Engineering and Technology, page no: 167-180. ISBN: 978-81-950722-9-3, MANGLAM PUBLICATIONS DELHI-110053 (INDIA), Volume 1,167-180.

STUDENT ACHIEVEMENTS

EXTERNAL RECOGNITION

Lokesh Kumar M, 3rd year, had won a National level E-hackathon conducted by Indus University and secured 2nd place with a cash prize of Rs. 3,000.

Lokesh Kumar M, 3rd year, has won a National level Technovation smart city hackathon conducted by Shardha University in collaboration with Greater Noida Industrial development authority and secured the Domain winners in healthcare sector and with a cash price of Rs.30, 000.

Anjana A, 3rd year, has won a National level E-hackathon conducted by Indus University and secured 2nd place with a cash prize of Rs.3, 000.

Anjana A, 3rd year, had won a National level Technovation smart city hackathon conducted by Shardha University in collaboration with Greater Noida Industrial development authority and secured the Domain winners in healthcare sector and with a cash price of Rs.30, 000.

Sherwin Robert, 3rd year, has won a National level E-hackathon conducted by Indus University and secured 2nd place with a cash prize of Rs.3, 000.

Sherwin Robert, 3rd year, had won a National level Technovation smart city hackathon conducted by Shardha University in collaboration with Greater Noida Industrial development authority and secured the Domain winners in healthcare sector and with a cash price of Rs.30, 000.

Rebecca Maria G, 3rd year, has won a National level E-hackathon conducted by Indus University and secured 2nd place with a cash prize of Rs.3, 000.

Rebecca Maria G, 3rd year, had won a National level Technovation smart city hackathon conducted by Shardha University in collaboration with Greater Noida Industrial development authority and secured the Domain winners in healthcare sector and with a cash price of Rs.30000.

Raama Narayanan A, 2nd year participated in YRC Republic day events ‘Connection game’ and ‘quiz’, SSN YRC Team, won First place, on 26/01/2021.

STUDENT ACHIEVEMENTS

Mr. Mutheeswaran Umapathi, PG student, participated in AICTE ATAL Academy Online FDP on "Augmented Reality (AR)/ Virtual Reality (VR)" from 2021-1-18 to 2021-1-22 at Hindustan Institute of Technology & Science.

Mr. Mutheeswaran Umapathi, PG student, participated in AICTE ATAL Academy Online FDP on "Wearable Devices" from 2021-2-15 to 2021-2-19 at Anna University.

Mr. Mutheeswaran Umapathi, PG student, participated in AICTE ATAL Academy Online FDP on "Control Systems & Sensors Technology" from 2021-2-1 to 2021-2-5 at National Institute of Technology Calicut.

Manjari Kaleeswaran, Medical Electronics 1st year, participated in a panel discussion on 'Changes in Medical Devices Industry and Regulations in last five years' organized by Sahrdaya College of Engineering & Technology on 14th January 2021.

Sachin Raj S.P, Medical Electronics 1st year, participated in a Two-Day Virtual Workshop on "Biomedical Applications using Nanotechnology" organized by Department of Biomedical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam, on 20-21st January, 2021.

Sachin Raj S.P, Medical Electronics 1st year, participated in Plenary webinar by Dr. David crystal.

Tuhina Abraham, Medical Electronics 1st year, participated in a Two-Day Virtual Workshop on "Biomedical Applications using Nanotechnology" organized by the Department of Biomedical Engineering, Sri Sivasubramaniya Nadar College of Engineering on 20-21st January, 2021.

Vidhya N, Medical Electronics 1st year, participated in a Two-Day Virtual Workshop on "Biomedical Applications using Nanotechnology" organized by the Department of Biomedical Engineering, Sri Sivasubramaniya Nadar College of Engineering, on 20-21st January, 2021.

Padmavati S, 3rd Year BME, attended "Comprehensive Biomedical Instrumentation On-Site Training" conducted by MedCuore Medical Solutions Pvt. Ltd from 18.01.2021 to 29.01.2021.

STUDENT ACHIEVEMENTS

Chethana krishnan, 3rd year BME, has participated in ZS hackathon and the idea has been selected for top 50 innovation.

Arthi, 3rd year, has completed "Comprehensive Biomedical Instrumentation On-site Training" offered by Medcuore Medical Solutions Private Limited from 18-Jan-2021 to 29-Jan-2021.

Crossny snowlin R, 3rd year, has completed "Comprehensive Biomedical Instrumentation On-site Training" offered by Medcuore Medical Solutions Private Limited from 18-Jan-2021 to 29-Jan-2021.

Rebecca Maria G, 3rd year, participated in a National Level Workshop on LabVIEW and Its Application in Healthcare, Organized by Dept. of Biomedical Engineering during Jan.29-30, 2021.

Pooranima G, 3rd year, participated in a National Level Workshop on LabVIEW and Its Application in Healthcare, Organized by Dept. of Biomedical Engineering during Jan.29-30, 2021.

Keerthana B, 3rd year, participated in a National Level Workshop on LabVIEW and Its Application in Healthcare, Organized by Dept. Of Biomedical Engineering during Jan.29-30, 2021.

Melwin Meston T, 2nd year, completed a NPTEL course on ‘Biomedical nanotechnology’ and received completion certification.

Tharunika T M, 2nd year, completed a NPTEL course on ‘Biomedical nanotechnology’ and received completion certification.

Raama Narayanan A, 2nd year attended a Virtual Workshop on "Biomedical Applications using Nanotechnology" on 20, 21 January 2021.

Santhoshiya TV, 2nd year, completed a NPTEL course on ‘Biomedical nanotechnology’ and received completion certification.

Santhoshiya TV, 2nd year, completed a NPTEL course on ‘Genetic Engineering’ and received completion certification.

V.Aiswarya, participated in a two-Day online workshop on "Biomedical Applications using Nanotechnology " on 20/1/21 and 21/1/21 conducted by SSN College.

STUDENT ACHIEVEMENTS

R Dhanush Babu - 2nd year, completed a NPTEL course on 'Immunology' and received completion certification

R Dhanush Babu, 2nd year, completed a course 'AI for Medical Diagnosis' in Coursera.

R Dhanush Babu, 2nd year, attended an online workshop on 'Biomedical applications of Nanotechnology' from 20/01/21 to 21/01/21.

Santhoshiya TV, 2nd year participated in an online Quiz competition on 05/01/2021.

Arushi Sahu, 2nd year, completed a NPTEL course on 'Biomedical nanotechnology' and received completion certification

Santhoshiya TV, 2nd year, attended an online workshop on 'Biomedical applications of Nanotechnology' from 20/01/21 to 21/01/21.

Dhanya R, 2nd year, attended an online workshop on 'Biomedical applications of Nanotechnology' from 20/01/21 to 21/01/21.

Janani Thirukumar, 2nd year, completed a course on Psychological First Aid in Coursera on 27/01/2021.

Harish Sridhar, 2nd year, completed a NPTEL course on 'Biomedical nanotechnology' and received a completion certificate.

Janani Thirukumar, 2nd year, attended an online workshop on 'Biomedical applications of Nanotechnology' from 20/01/21 to 21/01/21.

Siva Adithya, 2nd year, completed a NPTEL course on 'Biomedical nanotechnology' and received a completion certificate.

Janani Thirukumar, 2nd year, attended an online workshop on CoronaVirus: Basic Knowledge and Preventive Measures on 03/01/2021.

Chandramouli K, 2nd year, attended an online workshop on 'Biomedical applications of Nanotechnology' from 20/01/21 to 21/01/21.

Janani, 2nd year, completed a NPTEL course on Introduction to the Internet of Things - and received a completion certificate.

STUDENT ACHIEVEMENTS

N.V.Saravanan, 2nd year, completed a NPTEL course on 'Biomedical nanotechnology' and received a completion certificate.

Sanjay C, 2nd year, completed a NPTEL course on Introduction to Biostatics and received a completion certificate.
Nithyashree B, 2nd year, completed a NPTEL course on 'Biomedical nanotechnology' and received a completion certificate.

Pravalika P, 2nd year, completed a NPTEL course on 'Biomedical nanotechnology' and received a completion certificate.

Mohamed Farazallah M, 2nd year, completed a NPTEL course on 'Biomedical nanotechnology' and received a completion certificate.

Ragavi T K, second year PG attended two Day Virtual Workshop on Biomedical Applications using Nanotechnology organized by Department of Biomedical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam, On 20-21st January, 2021.

Sowmiya EC, second year PG attended FHS MDQA India webinar series 2021 (18.1.2021 - 20.1.2021)

Isa Bashir Salisu, of II-year Medical Electronics participated in Two Day Virtual Workshop on "Biomedical Applications using Nanotechnology" organized by Department of Biomedical Engineering, Sri Sivasubramaniya Nadar College of Engineering, on 20-21 Jan, 2021.

Keerthi Vembu, PG II year attended Three Great Learning Courses and Webinar on Biomedical applications on Nanotechnology.

Manjari Kaleeswaran, Medical Electronics first year, participated in Two Day Virtual Workshop on "Biomedical Applications using Nanotechnology" organized by Department of Biomedical Engineering, Sri Sivasubramaniya Nadar College of Engineering, on 20-21st January, 2021.

Yaamni A, Medical Electronics first year, participated in Two Day Virtual Workshop on "Biomedical Applications using Nanotechnology" organized by Department of Biomedical Engineering, Sri Sivasubramaniya Nadar College of Engineering, Kalavakkam, On 20-21st January, 2021.

STUDENT ACHIEVEMENTS

Brenda Jennifer Baskar, Medical Electronics 1st year, participated in Two Day Virtual Workshop on “Biomedical Applications using Nanotechnology” organized by the Department of Biomedical Engineering, Sri Sivasubramaniya Nadar College of Engineering, on 20-21st January, 2021.

Sandhyavarshini R, 3rd year, has completed a virtual internship in the Title Data science Offered by IETE Mumbai in association with Pantech E Learning for a duration of 20 days.

Sowmya E.C, attended webinar on "Indian medical electronics industry - challenges & way forward” and attended 6 days FDP on "Artificial intelligence, machine learning and Deep learning" conducted by ATAL.

Keerthi vembu, completed Course on Introduction to Tensorflow and Keras with GL Academy.

Jeslin Libisha, second year PG attended AICTE sponsored Online Short-Term Training Programme on FPGA based Digital System Design with HDL (Phase-II), Training Program Dates -08 February 2021 to 13 February 2021.

Jeslin, second year PG attended AICTE sponsored Online Short-Term Training Programme on FPGA based Digital System Design with HDL (Phase-III), Training Program Dates - 22 February 2021 to 27 February 2021.

Jeslin, second year PG attended Indo-USA Online Short-term Course on "VLSI Architectures for Energy-Efficient Embedded Healthcare Systems” between February 26- 28, 2021 under the SPARC program of Ministry of Education, Govt of India.

RaamaNarayanan A, second year attended 10 Hours Training Course for Biomedical Engineers / Students in the Critical Care Area - Nihon Kohden India-Participation-20/09/2020 to 18/02/2021-Chennai.

RaamaNarayanan A, second year attended Two-day Workshop on "Assistive Technology - The challenges- ECE Department, Sri Sivasubramaniya Nadar College of Engineering on 15/02/2021&16/02/2021.

R Dhanush Babu, second year completed online course MATLAB on 08/02/2021.

R Dhanush Babu, second year participated online competition Hack Infinity organized by SSNCE during 22/01/2021 to 23/01/2021.

R Dhanush Babu, second year attended Biomedical online training course for critical care area products –organized by Force Biomedical group on 19/02/2021.

STUDENT ACHIEVEMENTS

R Dhanush Babu, second year attended an online Workshop on Mentorship for Innovators on 06/02/2021.

Chandramouli K, second year participated in the online competition Hack Infinity organized by SSNCE during 22/01/2021 to 23/01/2021.

Chandramouli K, second year attended an online Workshop on Mentorship for Innovators on 06/02/2021.

Chandramouli K, second year completed online course MATLAB on ramp on 08/02/2021- 28/02/21.

Ragavi T K Second year has participated in the one-day workshop on "Mentorship for Innovators" on 06/02/2021.

Mohammed Adhil S, attended One day webinar on the topic "One QA- a biomeds best friend on 23-02-2021.

Mohammed Adhil S, Attended one day workshop on the topic "Mentorship for Innovators" on 06-02-2021.

Yaamini.A, first year Medical Electronics, attended a workshop One QA biomeds friend on Feb 23 2021

I Mannat Uppal, first year Medical Electronics, attended One day workshop on "Mentorship for Innovators" which was organized by IIC & BME, SSN CE on 6th February, 2021.

A.Yaamini, first year Medical Electronics, attended One day workshop on "Mentorship for Innovators" which was organized by IIC & BME, SSN CE on 6th February, 2021.

Tuhina Winter, attended a workshop on wearable sensors and devices organized by IEEE Gujarat section sensors council chapter on 6th-7th Feb 2021.

I Mannat Uppal, first year ME attended a webinar on One QA - A biomed's best-friend on 23rd, February, 2021 by Fluke Biomedical.

Tuhina, attended a one-day workshop on the topic "Mentorship for Innovators" on 06-02-2021.

STUDENT ACHIEVEMENTS

Vidhya N, first year ME attended webinar on One QA - A biomed's best-friend on 23rd, February, 2021 by Fluke Biomedical.

Sreya Reddy.K, of biomedical engineering attended the workshop Neurofeedback and Biomed best friend on 22-23 Feb and Mentorship for innovators on 6 Feb.

R. Viji Priyadharshini, first year Medical Electronics attended a one-day workshop on "Mentorship for Innovators" organized by IIC BME, SSN on Feb 06,2021.

R. Ajitha, first year Medical Electronics attended a one-day workshop on "Mentorship for Innovators" organized by IIC BME, SSN on feb 06, 2021.

Ajitha R, first year Medical Electronics attended the webinar-One QA - a biomeds best friend on February 23, 2021.

Viji Priyadharshini R, first year Medical Electronics attended the webinar-One QA - a biomed best friend on February 23, 2021.

Mohammed Adhil S, attended 2-day workshop on the topic "Neurofeedback and Biofeedback Devices" on 22.02.2021 to 23.02.2021

Sachin Raj, first year Medical Electronics attended the webinar-One QA - a biomed best friend on February 23, 2021.

STUDENT ACHIEVEMENTS

EXTERNAL RECOGNITION EXTRA-CURRICULAR

V Aishwarya, second year UG performed classical dance at Dancers club dance event Part of team Anartana on 17/1/21 organized by Dancers club society Royapettah, Chennai.

Kritik Varshi B, second year UG participated in the online competition Art Avial at Saarang organized by IIT madras on Feb 4.

Kritik Varshi B, second year UG participated in the online competition Draw your Version - Saarang organized by IIT madras on Feb 5 Online.

Kritik Varshi B, has won second runner up prize in the online event organized by SSN MUN - SSN – on Feb 20 and 21, 2021.

Arushi Sahu, second year UG participated in an online Designing event at INVENTE 5.0 organised by CSE DEPARTMENT on 23 January 2021.

V.R Nivedha Shalini, participated in the online Model United Nation Delegate of Brazil in DISEC from 20/2/2021 to 21/2/2021.

STUDENT ARTICLES

AI AND ALZHEIMER'S DISEASE

-Aarya Raghavan, 2nd Year, BME.

AI has proved to be helpful in both the diagnostics and treatment of Alzheimer's disease, according to studies by both the University of California San Francisco (UCSF) and Harvard.

In 2019, at UCSF, researchers were able to program a machine-learning algorithm to diagnose early-stage Alzheimer's disease about six years before a clinical diagnosis is made – potentially giving doctors a chance to intervene with treatment. No cure currently exists, but promising drugs have emerged in recent years that can help stem it's progression. However, they must be administered early in the course of the disease to have any real effect, so scientists have been searching for ways to diagnose it before too many neurons have died, making it irreversible.

Glucose is the primary source of fuel for brain cells, and the more active a cell is, the more glucose it uses. As they become diseased and die, they use less and, eventually, no glucose. Positron emission tomography (PET) scans, measuring the levels of specific molecules, like glucose, in the brain have been used in diagnosis, before the symptoms become too severe.

Glucose PET scans are more common and cheaper, especially in smaller health care facilities and developing countries, as they're also used for cancer staging. Radiologists have used these scans to try to detect Alzheimer's by looking for reduced levels across the brain, especially in the frontal and parietal lobes. However, because the disease is slow and progressive, the changes in glucose are very subtle and difficult to spot with the naked eye. To solve this problem, an ML algorithm was applied to the PET scans to diagnose the disease more reliably.

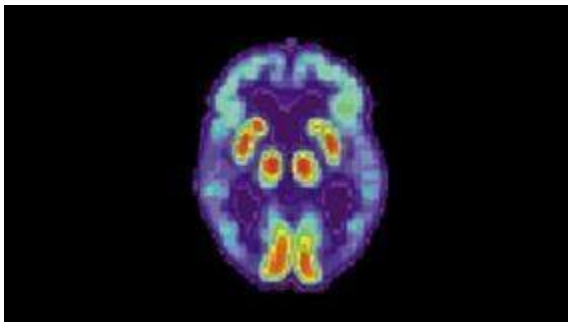


Figure 1: A PET scan of the brain of a person with Alzheimer's disease

The algorithm is trained by feeding it with images from the 'Alzheimer's disease Neuroimaging Initiative' (ADNI), a massive public data-set of PET scans from patients who were diagnosed with either Alzheimer's disease, mild cognitive impairment or no disorder. Eventually, the algorithm self-learns as to which features are important for predicting it's diagnosis.

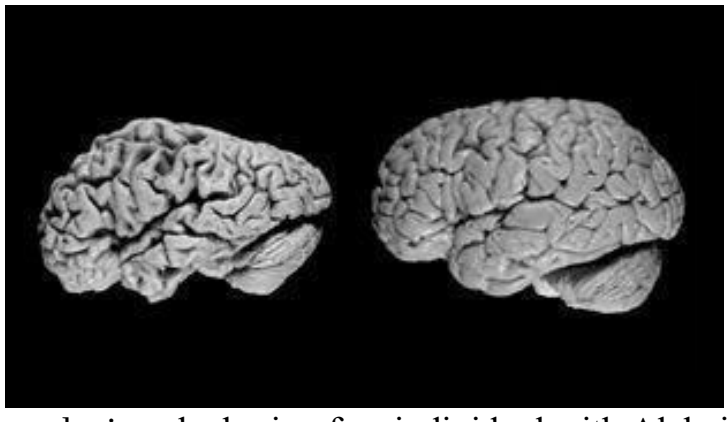


Figure 2: This figure depicts the brain of an individual with Alzheimer's (left) and a normal brain

The algorithm performed with flying colors- It correctly identified 92 percent of patients who developed Alzheimer's disease in the first test set and 98 percent in the second test set. What's more, it made these correct predictions in an average of 75.8 months before the patient received their final diagnosis, which is a massive breakthrough for potential early treatment.

AI was used for treatment at Harvard and Massachusetts General Hospital, where a team of researchers developed an AI method to screen currently available medication as possible treatments for Alzheimer's disease.

They applied the screening method to 80 FDA-approved and clinically tested drugs for a wide range of conditions and yielded a ranked list of candidates, with anti-inflammatory drugs used to treat rheumatoid arthritis and blood cancers emerging as top contenders. These drugs belong to a class of medications known as 'Janus kinase inhibitors' and work by blocking the action of inflammation, suspected to play a role in Alzheimer's disease, and known for their role in autoimmune conditions. Although Alzheimer's has been one of those diseases that has not yielded successful results even though so much research has been put into it, thanks to AI, in the next few years, Alzheimer's may have a strong treatment and potentially even a cure.

STUDENT ARTICLES

READING MINDS WITH ULTRASOUND: A LESS-INVASIVE TECHNIQUE TO BRAIN-MACHINE INTERFACING

-Divya Rajesh Kannan, 3rd year,BME.

Brain machine interfaces (BMIs) are devices that allow for activity in the brain to be sent to, or received from, a computer and for transmission of instructions. This technique has recently been used by neuroscientists for the mapping of neural activity to their corresponding behaviors. Though this may seem like an idea from a science fiction movie, existing BMIs are invasive although being used for 'futuristic' use cases, like connecting a paralyzed person with a robotic arm and the 'Neuralink' by Tesla, a robot designed to embed implants into the brain.

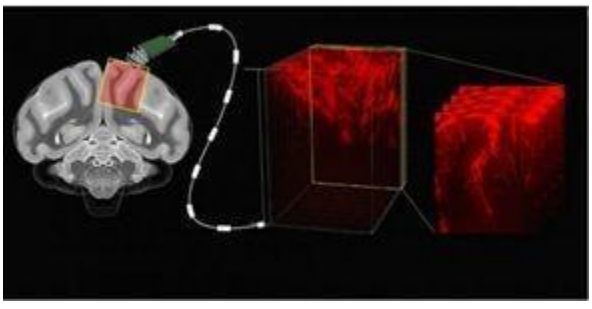
Neuralink's robot used for inserting electrodes into the brain (Photo: neuralink)

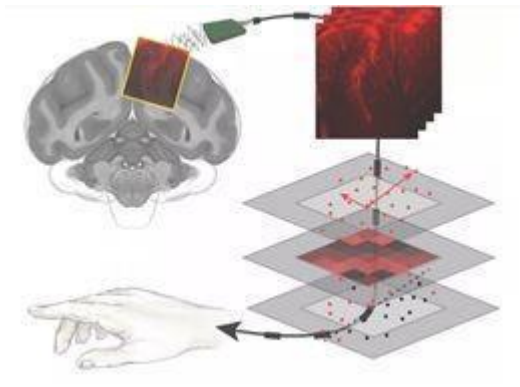
However, a major limitation of present BMIs is that these devices require invasive brain surgery or micro-electrodes for interpreting neural activity, which causes tissue damage. CalTech have developed a new minimally invasive BMI to read out brain activity corresponding to the planning of movement, while still being highly capable. In this method, functional ultrasound (fUS) technology is used to accurately map brain activity from precise regions deep within the brain at a resolution of 100 micrometers.

Ultrasound works by emitting pulses of high frequency sound and measuring how their vibrations echo through the tissues.The difference in speeds of sound through different tissues, and reflection at the boundaries is used for diagnostic imaging. It is also used to "hear" the internal motion of organs, as they increase in pitch when approaching ultrasound waves source, and decrease as they flow away. Measuring this phenomenon has allowed the researchers to record tiny changes in the brain's blood flow down to 100 micrometers, the width of human hair strand.

STUDENT ARTICLES

A technique like functional ultrasound gives high-resolution, detailed images of the brain's blood flow dynamics of neural signals in space and over time in the target region that cannot be seen even with other non-invasive techniques like fMRI.





fUS Non – human primate brain

The technology was developed with the aid of non-human primates, who were taught to do simple tasks that involved moving their eyes or arms in certain directions when presented with certain cues. As the primates completed the tasks, the fUS measured brain activity in the posterior parietal cortex (PPC), a region of the brain involved in planning movement. The Andersen lab has studied the PPC for decades and has previously created maps of brain activity in the region using electrophysiology. To validate the fUS's accuracy, they compared the brain imaging activity from it to the previously mapped data.f

Next, with the T&C Chen BMI Center at Caltech, they aimed to see if the activity-dependent changes in the fUS images could be used to decode the intentions of the non-human primate, even before it initiated a movement.

The ultrasound imaging data and corresponding tasks were processed by a machine-learning algorithm, which learned what patterns of brain activity correlated with which tasks. Once the algorithm was trained, it was presented with ultrasound data collected in real time from the non-human primates. It predicted, within a few seconds, what behavior the non-human primate was going to carry out (eye movement or reach), direction of the movement (left or right), and when they planned to make the movement.

Thus, the functional ultrasound is a good alternative to the invasive techniques and can be used to measure and decode brain activity in these individuals, as well as predict intended movements before they happen.

STUDENT ARTICLES

Human-Derived Organ-on-a-Chip for Personalized Drug Development

- Nandhini.J, 2nd year, BME.

To reduce the required capital and time investment in the development of new pharmaceutical agents, there is an urgent need for pre-clinical drug testing models that are predictive of drug response in human tissues or organs. Organ-on-a-chip (OOC) platforms have proven potential in providing tremendous flexibility and robustness in drug screening and development by employing engineering techniques and materials.

The inevitable number of drug assessment phases, from research and development to post-clinical evaluations have mandated it to be a slow-paced and over-priced procedure. Formulating new drugs for diseases like cancer, certain organ and neurological disorders, becomes even more challenging and time-consuming when difficulties like drug resistance and incomplete understanding of the disorder's pathophysiology comes into play.

Figure depicting production of a Human Organ-on-a-Chip

Other challenges include, the achievement of high reliability and predictability in the outcome of drug treatment to ensure that unforeseen side effects are minimized and consideration of the individual genetic variations. While epigenetic and environmental factors can be tremendously impactful in a patient's response to treatment, these effects remain largely under-investigated and are unknown.

Recently, organ-on-a-chip (OOC) technology has drawn large attention to itself as it reflects the genetic characteristics of the cells in each patient. It is an engineered assembly of a controlled compartment to study, measure, and control cell behavior and response to various drug stimuli by replicating the cellular behavior of the target tissue micro-environment.

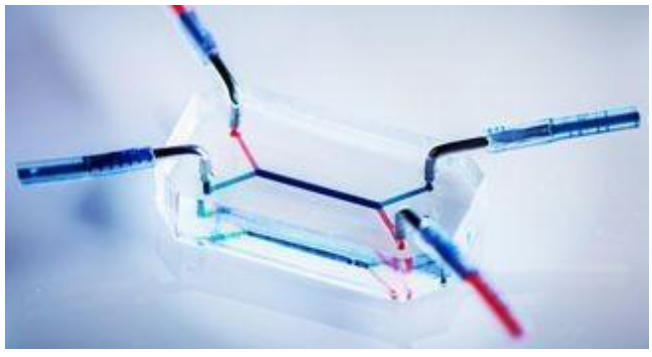
STUDENT ARTICLES

OOC has evolved from a combination of various engineering platforms such as microfluidic systems, engineered biomimetic tissues, and non-invasive monitoring systems to address the difficulties of conventional drug testing models. Owing to recent advances in engineered bio-materials, it is now possible to design organoids with two-dimensional (2D) and three-dimensional (3D) scaffolds equipped with suitable extracellular matrix (ECM) to closely mimic human cell adhesion, migration, differentiation and function in the in-vitro system.

The cells are derived from the patient, cultured and reprogrammed to different cell types. The device is fabricated using various micro-fabrication and 3D printing techniques and the printed cells are seeded and cultured here. The target drug candidates are tested and analyzed using the OOC model followed by in vivo test. Next, drug dosage and type are decided based on the responses received from these tests and are later scaled to achieve a personalized drug for the patient.

Other advantages compared with conventional drug testing platforms include higher efficiency in screening time, chemical/biological gradient screening, and reduced consumption in costly cell lines and chemical/biological reagents.

Thus, hiPSC-integrated OOCs provide a useful tool to establish personalized drug testing platforms that can mimic human physiology tuned for specific patient groups and individuals.



STUDENT ARTICLES

CANCER IMMUNOTHERAPY

-Yuvasri a, 3rd year, BME.

Cancer is amongst the leading causes of death worldwide. According to the reports released by ICMR in association with National Centre for Disease Informatics & Research Bengaluru, there will be around 15.7 lakhs cancer cases by 2025.

Figure of a cancer cell:

Normally human cells have the capability to grow and divide to form new cells and when the cells get damaged or too old, they die.This is an orderly process which takes place in all human bodies. However, in cases of cancer, there is an interference in this process which causes abnormal cell growth. Due to mutations in the DNA, the cells divide uncontrollably and form a tumour that can be benign or malignant. A benign tumour is a lump of cells that do not spread.

These are not cancerous but can be fatal

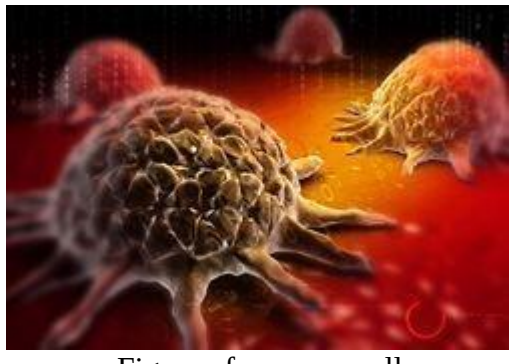


Figure of a cancer cell

Malignant tumours can spread and invade other parts of your body. This process, known as metastasis, is a condition where cancer cells leave the main tumour and enter the bloodstream or lymphatic system to form tumours in other organs or tissues of the body.

Depending upon the type and stage of the cancer, a combination of treatments is given. This might include surgery with chemotherapy or radiotherapy. One of the main downsides of these treatments is that it does not necessarily destroy all cancerous cells, which increases the chances of cancer recurrence. While chemotherapy fights the cancer directly, immunotherapy enhances the ability of the immune system to destroy cancer cells.

STUDENT ARTICLES

Immunotherapy is a broader category that includes many types of cancer therapies which stimulate the immune system to fight against the cancerous tissue.

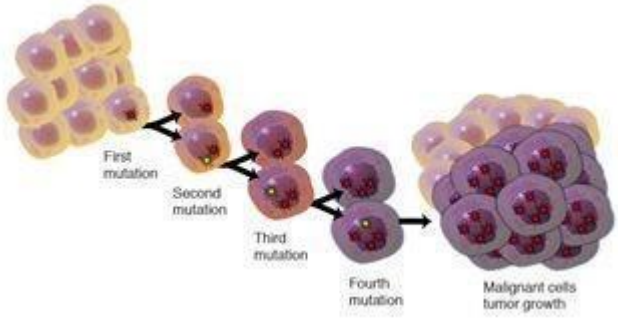
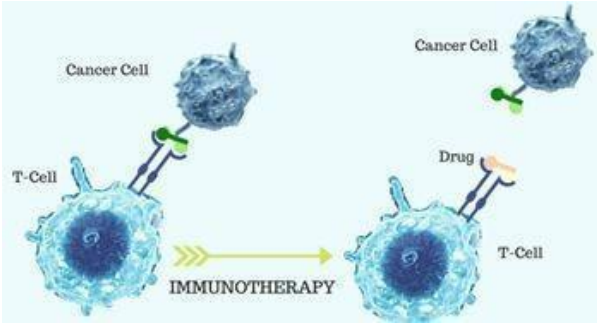


Figure of a malignant tumor:

TYPES OF IMMUNOTHERAPY:

- CANCER VACCINES: The immune system attacks the antigens and gets rid of them. Cancer cells have 'cancer-specific antigens' on their surface. The vaccines increase the immune system's ability to find the antigens and attack it. In 2010, Sipuleucel-T (Provenge) was approved by the FDA to treat prostate cancer, Talimogene laherparepvec (T-VEC) to treat advanced skin cancer and apart from these, many other vaccines have shown promising results in clinical trials though they aren't approved by the FDA yet.

- MONOCLONAL ANTIBODIES: They are laboratory produced molecules that are designed to bind to antigens found on the surface of cancer cells. They are also used to deliver radioactive materials and drugs within the body. Alemtuzumab is a drug which is used to treat leukemia. Zevalin is an example of a radiolabeled mAb, which delivers radioactivity directly to the site of the cancer cells.



This figure depicts the process of immunotherapy on the cancer cell

● ADOPTIVE CELL THERAPY: In this type of therapy, T-cells are taken from the patient's blood, cultured in the laboratory to large numbers and then injected back into the patient. In some cases, they are also modified to enhance their ability to destroy cancer cells such as in tumour infiltrating lymphocytes therapy, Engineered T-Cell receptor therapy and CAR T-cell therapy.

● IMMUNOMODULATORS: These are molecules that act on the pathways that regulate the immune system.

1. CHECKPOINT INHIBITORS: Checkpoint inhibitors prevent the closing of certain pathways of the immune system. This enhances and promotes new responses of the immune system to eliminate the cancer cells. Avelumab, Cemiplimab are some of the popular FDA approved checkpoint inhibitors.

2. CYTOKINES: Cytokines control the growth, maturation and differentiation of immune cells. They are injected to enhance the immune system. Aldesleukin and Peginterferon Alfa-2b are some of the major cytokines approved by the FDA.

Immunotherapy is still a developing field with a lot of scope for improvement. Researchers from John Hopkins University have invented a new type of cancer immunotherapy that promises a significant reduction in tumour growth, even the ones that did not respond to other immunotherapies!

One of the biggest advantages of immunotherapy when compared to conventional treatment is that there are significantly less side effects.

At present, it is available only for certain types of cancer but researchers believe that in the near future it could lead to personalized medicine and help cure all types of cancer.

STUDENT ARTICLES

A Magical journey of 4 years….

This is what a close-knit family looks like over 4 years of Engineering. Like South sea pearls in an oyster, all of us have come a long way to become the best version of our valuable selves. We grew together, formed bonds with friends and professors, studied last minute, walked miles to toggle between English classes and finally get that well deserved degree! Graduating through the pandemic has been lucky for a few reasons.

I thank the department for bringing all of us together under one roof, for we shall cherish memories made here throughout our lives.

-Sivabala M, IV year

STUDENT ARTICLES

The Journey from calling anna to being called anna, this 4 year of college life has left us all reaching out to a box of tissues. The world we live in is plagued with dangers: corona, global warming, and despite all the odds we managed to make it through all. It was only 4 years ago we walked into the humanities block with dreams and grit in our eyes and found ourselves lost in the campus like they were the changing staircases of Hogwarts. And we have come a long way since then. I am very privileged to have been part of this class because in no other class would I have had the opportunity to know my imperfections, change them or wear them if necessary.

"Never forget what you are. The rest of the world will not. Wear it like an armor, and it can never be used to hurt you".

Now is our time to take on the world, and to find and pursue our passions, to quote unquote "Leave a legacy". Keep in mind that many of the greatest leaders started as average people. Despite the failures and mistakes, we will make, and although we may be "AVERAGE", we find that the average can achieve greatness. Greatness comes from our friend reaching out to us, those who go out of their way to be thoughtful, the unsung heroes. If there is anything you take from today remember that to "leave a legacy" and to "achieve greatness" is not to get money and recognition, it's to leave those with whom you cross paths with little more happiness and hope.

"For what it's worth: it's never too late to be whoever you want to be. Stop wherever you want to stop, there are no limits. I hope you see things that startle you. I hope you feel things you have never felt before. I hope you live a life you are proud of. If you find that you are not, I hope you have the courage to start all over again"

- Abhijith S, IV year

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