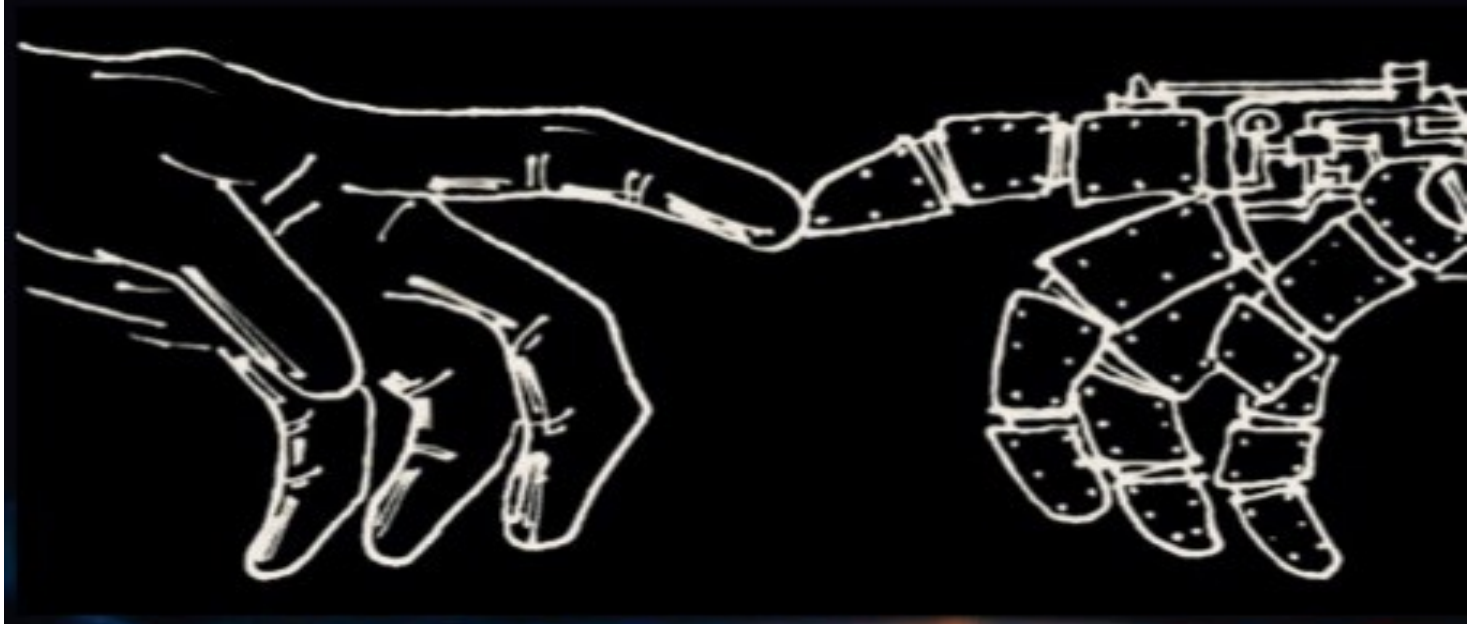
DEPARTMENT OF BIOMEDICAL ENGINEERING



SSN

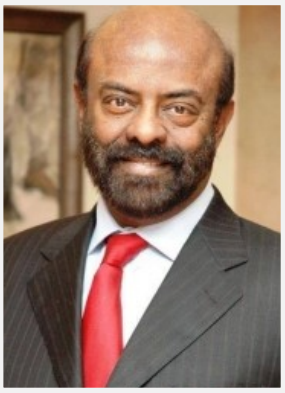
OVERVIEW

ABOUT SSN

SSN Institutions, founded by Dr.Shiv Nadar, Chairman, HCL Technologies, stands out as a premier centre of higher learning with a mission of pursuing excellence in education and research. The institutions, with their diverse and dynamic community of students offer a distinctive combination of some of the finest graduate, undergraduate and research programs, accomplished faculty, world class facilities and a residential campus set on a sprawling 250 acres of sylvan surroundings.

SSN College of Engineering has been ranked 27th by the National Institutional Ranking Framework 2017 released by the Ministry of Human Resources and Development, among all engineering colleges in India. SSN is ranked number one private engineering institution in Teaching, Learning & Resources and 17th among all engineering institutions in the category. SSN is ranked number five among all private engineering institutions in India. SSN Col-lege of Engineering has also been accredited by the NAAC with an A+ grade and also by NBA for 5 consecutive years. SSN College had been designated as an Autonomous University in 2018 and later established itself as a state university.

ABOUT THE FOUNDER



SSN Instituitions was found by Padma Bhushan Dr.Shiv Nadar,Chairman of HCL Technologies. In 1994, Nadar established what he believed was closest to his heart – the philanthropic Shiv Nadar Foundation and created its first initiative in Chennai, the SSN Institutions, that is a top ranked engineering college. Today the Foundation is a significant driver of social change and transformational education through its landmark institutions spanning the entire education spectrum from schools to universities. A young and a unique research led interdisciplinary university, the Shiv Nadar University has been identified

ABOUT THE DEPARTMENT

The Department of Biomedical engineering reflects the interdisciplinary ideas and offers world class education and research opportunities to students. It was started in the year 2005 offering B.E degree in Biomedical Engineering. The department has been recognised as a research centre in 2011 and offers Ph.D. degree in Biomedical Engineering. It also offers Master of Engineering degree in Medical Electronics, since 2014.

VISION

The Vision of Biomedical Department is to become a Centre of Excellence in biomedi-cal engineering for the prosperity of the country, ensuring quality health service delivery, education and research.

MISSION

- To educate students to understand the human body as an integrated system through quantitative engineering analysis and to use that understanding to design better therapeutic strategies, devices, and diagnostics
- To serve society by conducting research that develops quantitative linkages across scales in the human body and uses that development to build new tools to improve human health
- To catalyze interactions between biologists, physical scientists, and engineers to benefit medicine and human health
- To create enabling technologies through innovative and evidence based interventions and practices for the improvement of human health and health care

FROM THE HOD'S DESK

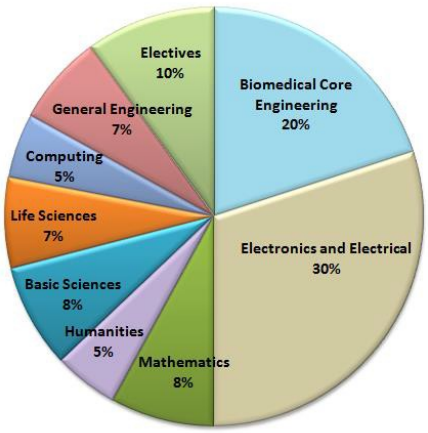
On behalf of the Department of Biomedical Engineering, it is my pleasure to invite you to our beautiful academic campus for conducting campus selection programmes for our students. It is my privilege to mention that this department was established in the year 2005 and over the years it has earned great recognition not only in India but all over the globe. The students of this department are occupying envi-able positions in various institutions for higher studies and organizations at home and abroad. The department has earned fame not only for its excellent academic and extracurricular activities, but also for its research and development activities.

A rigorous academic regimen has equipped students with the professional and personal skills to excel in which-ever domain sector they choose to work. All the students recruited from Biomedical Department of SSNCE have proved to be great asset to all organizations they have joined. I am certain that the present graduates would maintain the same level of performance. I wish the on-campus recruitment programme a great success and shall always look forward for mutually beneficial relationship with the recruit-ers of our graduates.

ABOUT THE DEPARTMENT

CURRICULUM

- Sensors and Measurements
- Object Oriented Programming and Data Structures
- Statistics, Transforms, Random Processes
- Anatomy and Human Physiology
- Analog and Digital ICs
- Pathology and Microbiology
- Analog and Digital Communication
- Bio Control Systems
- Diagnostic and Therapeutic Equipment
- Bio Materials and Artificial Organs
- Biomedical Instrumentation
- Microprocessor and Microcontroller
- Medical Physics & Radiological Equipment
- Biomechanics & Biofluids
- Digital Signal Processing & Image Processing
- Pattern Recognition and Neural Networks
- Medical Informatics
- Rehabilitation Engineering and Assist Devices
- Physiological Modelling
- Biometrics
- Soft Computing



INFRASTRUCTURE

The Department of Biomedical Engineering is equipped with:

- Bioelectronics Lab
- Biochemistry Lab
- Biomedical Instrumentation Lab
- Medical Software Lab
- Diagnostic and Therapeutic Lab
- Pathology and Microbiology Lab
- Data acquisition Lab
- Clinic
- Library

SMART INDIA HACKATHON 2019 (Hardware Edition)

TEAM BIOSES

Team Bioses of Biomedical department mentored by Dr.V.Mahesh, Associate Professor, BME, designed and developed a method for weight estimation of bed-ridden patients to prescribe the right dosage.

Overview

The right dosage for the patient, poses the need to create a bed-based solution for measuring the body weight based on which the doctor or surgeon would be able to determine the right dosage of drug or indicator. The idea developed was to fabricate a device that, when kept on the patient would display his/her body weight with a high accuracy- based on the automation of anthropometric measurements.

Team members:

- **Ananya. R, Dept of BME, 4th year**
- **C. Kezia Sharon, Dept of BME, 4th year**
- **Vaishali. H, Dept of BME, 4th year**
- **Kavya V Kannan, Dept of BME, 4th year**
- **Jagadeesh. A.S, Dept of BME, 4th year**
- **Arvindh Swaminathan. M.B, Dept of BME, 4th year**

A cash prize of Rs.1 Lakh from GE healthcare was won by the team at the grand finale held at BSDU Jaipur.

TEAM TECHDOCS

Team techdocs of BME and ECE mentored by Dr.Geethanjali B, Associate Professor, BME, designed and developed a continuous non-invasive blood pressure measurement.

Overview

By eradicating the present cuff method, the team developed a continuous non-invasive blood pressure measurement. The device works on the same principle of blood flow meters and works with minimal contact on the skin surface.

A cash prize of Rs.1 Lakh from GE healthcare was won by the team at the grand finale held at BSDU Jaipur.

Team members:

- **Suhashine.S, Dept of BME, 4th year**
- **Varshini Vinodhkumar, Dept of BME, 3rd year**
- **Sabharish Padmanaaban. M, Dept of ECE, 4th year**
- **Sriram V, Dept of ECE, 4th year**
- **Saikiran S, Dept of ECE, 4th year**
- **Vishaal Venkat, Dept of ECE, 4th year**

ABE INAUGURAL

The inaugural of association of Biomedical Engineers for the academic year 2019-2020 along with the inaugural of Vidhaan 2019 an intra-college biomedical tech Fest was held on the 20th of August, 2019. The chief guest, Mr. Arvind Srinivas, Business Head- Ultrasound, Philips inaugurated the event. The event kick started with the introduction of the office bearers of ABE followed by the lamp lighting ceremony by the Chief Guest, Dr. A. Kavitha, HOD BME, Ms. Dhanalakshmi, Assistant Professor / BME, Arvindh Swaminathan, President/BME and Kirthana.N, Secretary/BME.

The office bearers of the Association of Biomedical Engineers for the year of 2019—2020 are: Arvindh Swaminathan - President,
Kavya Vijaya Kannan - Vice President,
Kirthana N - Secretary,
Subramanian R P - Treasurer

Chief Guest, Dr.Kavitha, Prof & Head and Ms.M.Dhanalakshmi AP/BME

The talk delivered by Mr.Arvind Srinivas was a run-through of his learning journey. He gave an insight into how being a 'Why' person and 'How' person was important rather than being just a 'what' person. Other concepts of discipline, attitude and personality to acquire a job (*specifically in PHILIPS!*) was conveyed!

Followed by this, the students were awarded for their academic excellence and contribution to various departmental activities in the past academic year. The chief guest presented them with the awards.

The Best Performer for the academic batch 2015-2019 was awarded to 3 students:

1. Viswanath S
2. Praveen Kumar G
3. Om Prakash S

ABE INAUGURAL

The following students were awarded for patent filing in the academic year 2018-2019:

1. **Viswanath S**
2. **Praveen Kumar G**
3. **Om Prakash S**
4. **Apurva S**

Certificate of appreciation was also awarded to the current final years for their contributions towards the department.

T Akshara Reddy was awarded for her contribution to the placement activities Yohanya.R was awarded for her contribution to the innovation cell as the in-charge Prem Aravindan.J and Kavya V Kannan were awarded for their contribution to the Department's quarterly newsletter - SYNERGY as the editors.

INVENTE 4.0

After months of hard work by the students and faculty members of Sri Sivasubramaniya Nadar College of Engineering, Invente 4.0 saw its grand inaugural on 13th& 14th of September 2019. This two day technical festival started with its inaugural graced by the presence of our honourable Chief Guest for the day, Smt.P Gomathy, Manager-Digital Transformation-IOT , Tata Motors ,Dr.S.Salivahanan, Principal SSNCE, Dr. V. G. Idichandy, the Chief Mentor of Incubation and Innovation centre in SSN, and Dr S Radha The Head of Department of ECE. The Techfest magazine, TechVibe was released during this event. The gathering was addressed by Dr. S. Salivahanan who explicated about the achievements of SSN institutions and expedition of Invente 4.0. The Chief Guest, Smt. P Gomathy inspired the assembly with his words of wisdom about innovation and current trends in education systems. Dr S. Salivahanan offered the Chief Guest with a memento as a token of gratitude The whole proceeding was compered by Navaneeth (President-Mechanical) and S.Saikiran (President- ECE) delivered the vote of thanks.

The footfall of this years Invente turned out to be 4300 with active participants from different colleges.Invente 4.0 witnessed 60 technical events and 10 non-technical events across the 8 departements.Each of them had their own set of events and workshops. This year two centralised workshops were conducted by the IT and EEE departements. The Department of biomedical Engineering conducted its own technical and non-technical events workshop and paper presentation.

Considering inventions in the future and advanced sciences this year's theme was FRINGE SCIENCE.The entire department was decorated with respect to technolgies like cloning , teleportation , hynosis etc

INVENTE 4.0

Paper Presentation

The event witnessed 7 teams being shortlisted for presentations by the panek consisting of Dr.Vijay and Dr S Arun Karthick. Certificates were distributed to all the participants .The papers were various various domains in the field of biomedical engineering.

Technical events

The Events Biomart Biogonize and Scientlligence had 60,50,60 participants each.Prize money and certificates were given to the winners on the second day during the valedictory.

Non-Technical events

The events Game over and Multiverse had more than 70 participants each and was appreciated for the innovation and creativity in the events.

The entire department along with the support and guidance of the HOD Dr. A Kavitha , faculty co-ordinator Ms.M.Dhanalakshmi and faculty members worked together to make INVENTE 4.0 the most successful technical fests of BME.

IEEE-EMBS STUDENT CHAPTER

The IEEE—EMBS Student chapter was reinstated on August 1st, 2019, with its first event 'Think Engineer', the SIH Winners, came forward to share their experiences. The Office Bearers for the EMBS are Prem Aravindan (IV year), as the President, Kezia Sharon (IV year), the Vice President, Bhavadharini T (III year) the Secretary, Venkatramanan GR (III year) the Treasurer and Mayura Balagurunathan (III year) as the event coordinator. The Faculty Coordinator is Dr. S. Pravin Kumar Associate Professor. A number of successful events were thereafter conducted with a humongous participation from the students.

A one day technical talk on Ventilators SV900c and portable ventilator was organised by SSN IEEE EMBS student chapter on the 22nd of February, 2019. The aim of the talk was to explain and demonstrate the working of ventilators, thereby helping them to study it practically and gain exposure to the real working conditions. The speaker demonstrated the procedures for calibrating and setting different modes of op-eration. The talk was well received by the participants, who also expressed their interest for future events. Apart from getting to know the mechanism of working of ventilators, the participants were encouraged to contribute to set different modes of operation, to improve and hone their skills in handling medical equip-ment.

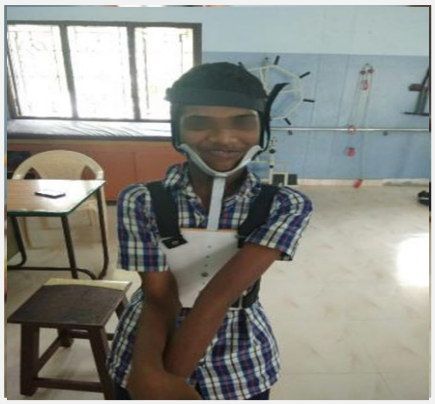
A one day Workshop on PCB Designing using Altium software was organised by SSN IEEE EMBS student chapter on the 7th of September, 2019. The aim of the workshop was to provide hands-on experience on the Altium software used for designing PCB digitally. The speaker educated the participants with the knowledge on how to use the software for designing and simulating PCB.

A two day technical talk on testing and calibration of various medical equipment was organised by SSN IEEE EMBS student chapter on the 6th& 7th of September, 2019. The aim of the talk was to explain and demonstrate how medical equipment like Defibrillators, diathermy machines, drug delivery pump, ventila-tor, patient monitor and ECG machines are calibrated and tested for safety in the medical field, thereby helping the students understand the importance of the same. There were theoretical and practical sessions presented by Mr. Dinesh Kumar and team to gain exposure to the real working conditions.

SOCIALLY RELEVANT PROJECTS

Cerebral Palsy Head Support

- Project by Vishwanath S and Praveen Kumar (2019)
- Under the guidance of Ms M Dhanalakshmi Assistant Professor, Department of Biomedical Engineering



Orthopedic belt using sodium acetate crystals

- Project by Vishwanath S and Apurva (2019)
- Under the guidance of Dr R Subashini, Assistant Professor, Department of Biomedical Engineering

Prosthetic limbs

- Project by Vaishali, M.E (2015)
- Under the guidance of Dr A Kavitha, Head of the Department of Biomedical Engineering and Ms R Nithya, Assistant Professor, Department of Biomedical Engineering

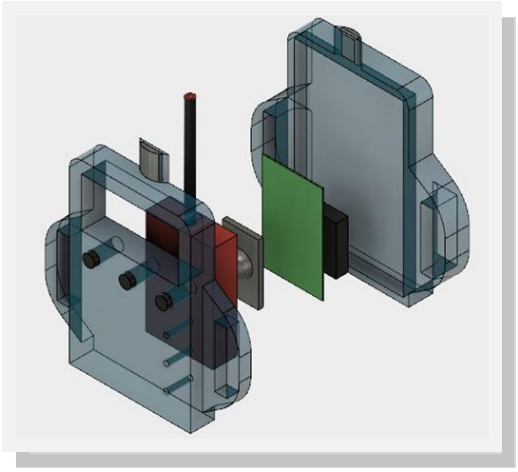
SOCIALLY RELEVANT PROJECTS

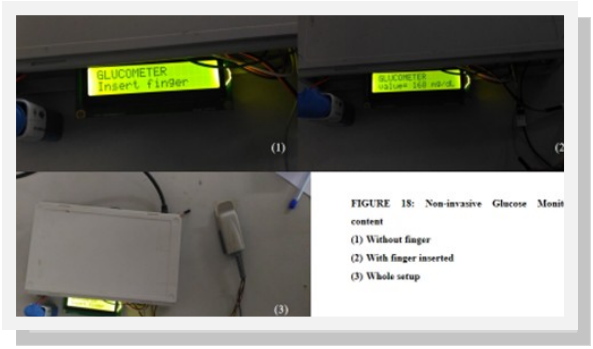
Mass screening device for osteoarthritis

- Project by R Abirami, N Meghala and S Tamizhamudham, (2018)

Electronic Nose for Diagnosis of Tuberculosis

- Project by Manuj R, Divya Rajagopal and Meghna Murali (2019)
- Under the guidance of Ms R Nithya, Assistant Professor, Department of Biomedical Engineering



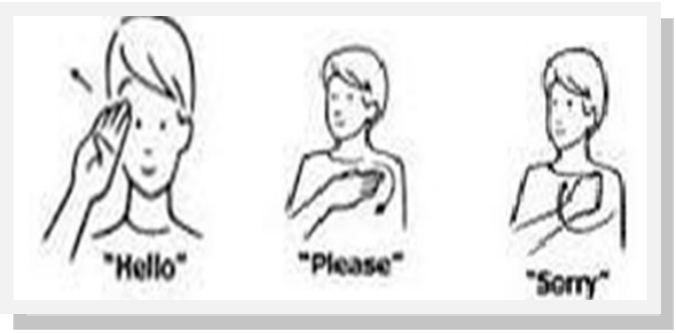


Non invasive glucose measurement

- Project by Haripriya and Nagavarshini (2018)
- Under the guidance of Dr L Suganthi, Assistant Professor, Department of Biomedical Engineering

Indian Sign language converter using sEMG

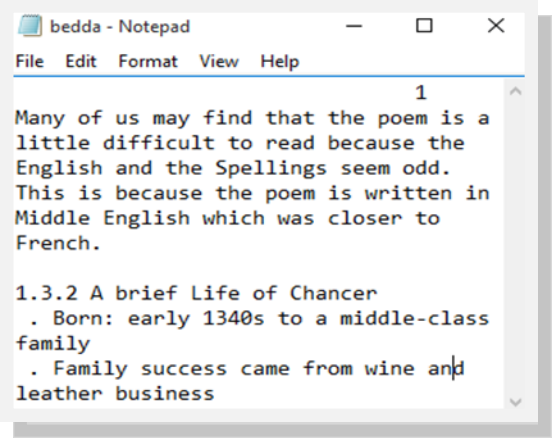
- Currently being worked on by B Sangeetha (2019)
- Under the guidance of Ms M Dhanalakshmi, Assistant Professor, Department of Biomedical Engineering



SOCIALLY RELEVANT PROJECTS

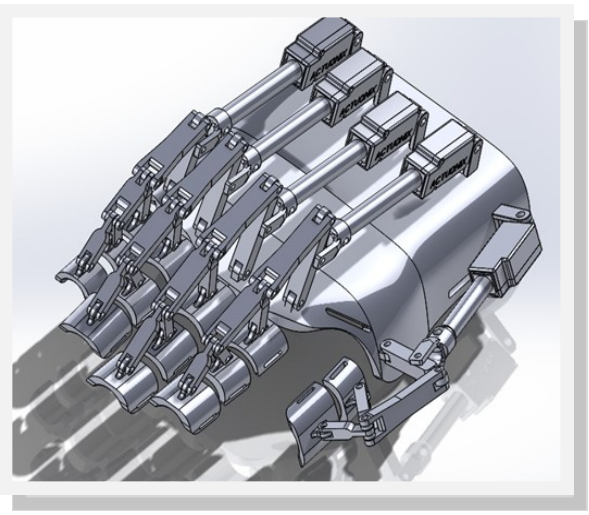
Braille transliteration for visually impaired

- Project by Sugirtha, M.E (2015)
- Under the guidance of Ms M Dhanalakshmi, Assistant Professor, Department of Biomedical Engineering



Exoskeleton

- Project by Rathi Adharshi, Shuruthi Sree.R and Santhana Lakshmi.A (2018)
- Under the guidance of Dr A Kavitha, Head of the Department of Biomedical Engineering



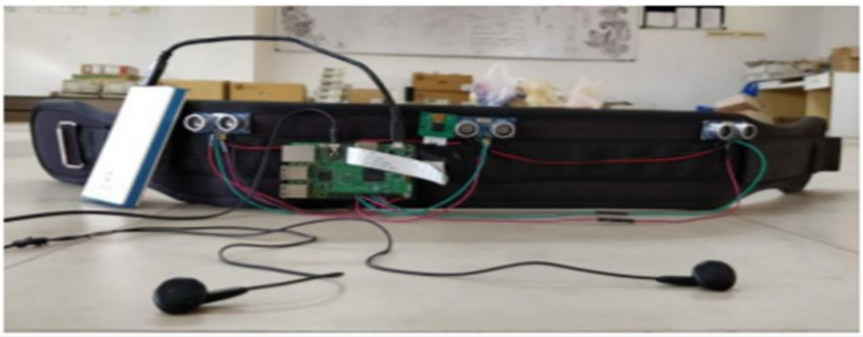
Low cost dialysis machine

- Project by Surya Prakash, R Gopichandran and M Vaibhav (2017)
- Under the guidance of Dr V Mahesh, Associate Professor, Department of Biomedical Engineering

SOCIALLY RELEVANT PROJECTS

Outdoor Obstacle Detection Module to Assist Visually Challenged.

- **Project by the Gayathri Devi, Anuradha V and Meena Nisha, IV year, BME (2018).**
- **Under the guidance of Ms M Dhanalakshmi, Assistant Professor, Department of Biomedical Engineering.**

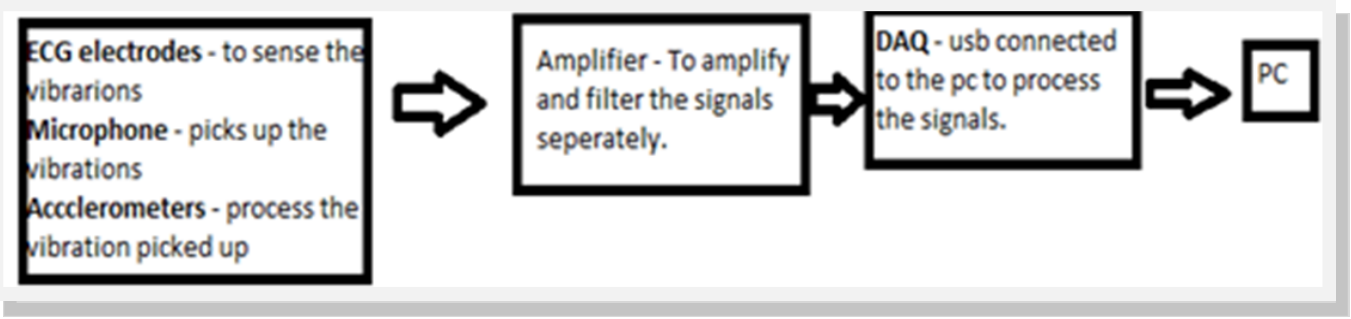


Virtual Reality for ASD

- **Project initially handled by Deepika and team (2014) and currently being handled by Yaamini D and Vish-wath Narayanan (2019).**
- **Under the guidance of Dr A Kavitha, Head of the Department of Biomedical Engineering.**

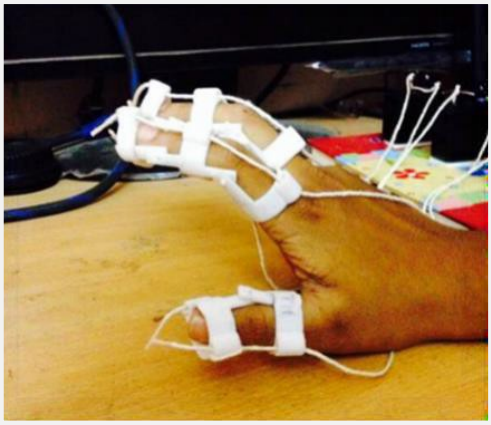
Non invasive JVP measurement

- **Project by Kavya Vijaya Kumar, and S Suhashine , III year, BME.**
- **Under the guidance of Dr S Bagyaraj, Associate Professor, Department of Biomedical Engineering.**

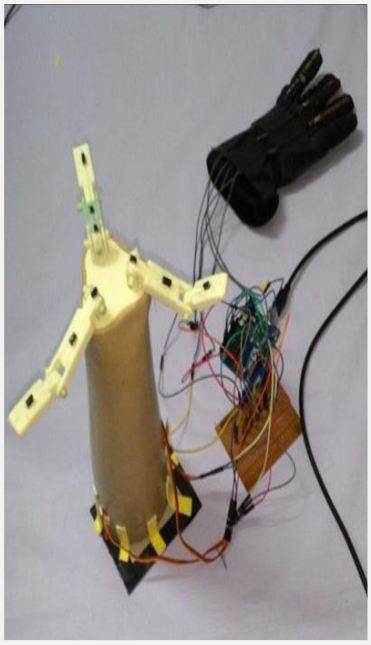


INNOVATIVE DESIGN CONTRIBUTIONS TO HEALTHCARE

Assist device for visually impaired



Design of Orthotic Assistive Exoskeleton for Human Hand



Design and Development of Hand Gesture Controlled Robotic Upper Limb Prosthesis

Design of Exoskeleton for Lower Extremities

Design of Quasi-passive Orthotic Exoskeleton for Lower Extremity

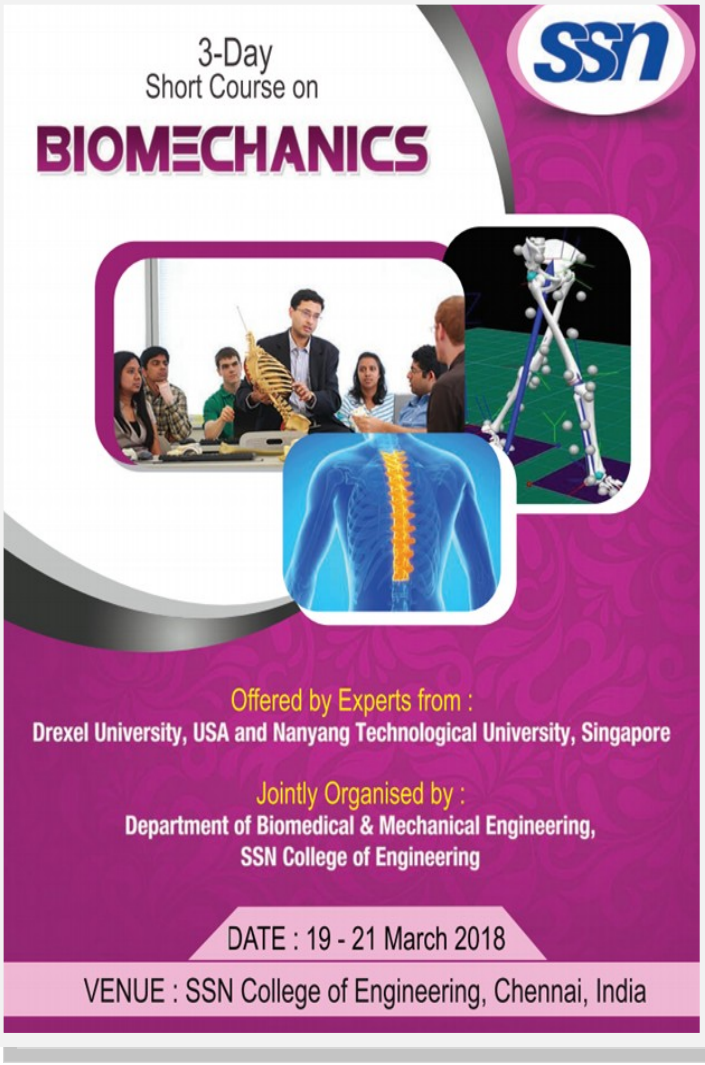
ICBSII'19

The Fifth International conference witnessed Dr Mamun Bin Ibne Reaz (Universiti Kebangsaan Malaysia) inaugurate the event, while the keynote speakers were Dr. K. Ganapath (Director, Apollo Telemedicine Networking Foundation, Apollo Hospital, Chennai), Dr. Sudhir Ganesan, Ortho Surgeon, Sri Ramachandhra Medical Centre, Chennai), Dr. Gowrishankar (Anaesthesiologist, Stanley Medical College, Chennai), Dr. Neelesh Kumar (Principal Scientist Biomedical Instrumentation Unit, CSIR-CSIO, Chandigarh), Dr. Dipanjan Roy (Scientist, Cognitive Brain Dynamics lab, National Brain Research Centre (NBRC)), Dr. S. Kanagaraj (Professor, Biomedical Devices and Biomaterials laboratory, Department of Mechanical Engineering, Indian Institute of Technology, Guwahati), Dr. Justin Dauwels (Associate Professor, Deputy Director of STE-NTU Corporate Laboratory, School of Electrical and Electronics Engineering,, Nanyang Technological University, Singapore). The topics of discussion included Artificial Intelligence, Nanocomposites, Brain connectivity, Remote Health Care to name a few. The first edition of the Department's Placement Brochure was also released in this event.

ICBSII'20

The department of Biomedical engineering takes pride in organising a variety of National and International conferences, the annual International conference of the Department is the "International Conference on Bio-Signals, Instrumentation and Image Processing". The conference has always been a grand event for the department with a whopping participation from around the state. This year, the conference was scheduled on the 27th and 28th February and was preceded by a Pre-conference workshop on Rehabilitation and Assistive Technology. The workshop involved preeminent speakers including Dr S Sundar (Medical Director, Prem Center for Physiotherapy and Rehabilitation Medicine, Chennai), Dr D Suresh Kumar (Scientist, Shoe and Product design centre, CLRI, Chennai), Mr R Ranjith (Principal, MERF Institute of Speech and Hearing, Chennai), Mr Sankar Subbiah (Assistive Technology and Accessibility Consultant, Agate Infotek, Chennai), Dr Basheer Ahamed Gulam (Orthopeadic Surgeon, American mission Hospital, Bahrain). Sixth International Conference on Bio signals, Images and Instrumentation was organized by the department of Biomedical Engineering in association with IEEE Madras section during February 27-28, 2020. Totally 93 papers were received from various regions across country and globally. Former director of IJN-UTM Cardiovascular Engineering Centre, Universiti Teknologi Malaysia and Dr. Justin Dauwels, Associate Professor, Deputy Director of STE-NTU Corporate Laboratory, School of Electrical and Electronics Engineering, Nanyang Technological University, Singapore were invited as chief guests for the inaugural function The keynote talks were delivered by the expert members in various topics on Mental health, Rehabilitation Engineering, Development of Medical Devices, Cardiovascular Management, and Clinical Engineering. The event has always been splendid, during the previous years as well many prominent members from the field of Biomedical Engineering have been part of the conference.

ACADEMIC COLLABORATIONS



The 3 day International Short Course on Bio-mechanics sponsored by DRDO was organised, between the 19th– 21st March, 2018 by the De-partment of Biomedical and Mechanical Engi-neering. 83 participants had enrolled for the course. Some of the experts present were Dr Sriram Balasubramanian, Drexel University, USA Dr Paul Brandt-Rauf, Dean, Drexel University,USA Dr Teo Ee Chon, Associate Professor, School of Mechanical and Aerospace Engineering, Nanyang Technological University (NTU), Singapore Dr G Sudhir, Spine Surgeon, SRMC Dr Dinesh Bhatia, Associate Professor and Head /BME, North Eastern Hill University, Shillong. The program was coordinated by Dr A Kavitha (Head of the Department of Bio-medical Engineering), Dr M S Alphin (Associate Professor, Depart-ment of Mechanical Engineering) and Dr S Bagyaraj (Associate Professor, Depart-ment of Biomedical Enginering)

SSN–DREXEL UNIVERSITY MS PROGRAM

This is Drexel University's International Collaborative Master of Science Program with Sri Siva SubramaniaNadar (SSN) College of Engineering. During this two-year program, the students will study the Drexel approved curriculum at SSN campus in Chennai, India in the first year. In the second year students land at Drexel University campus for the completion of remaining studies. The successful students would be awarded a Drexel MS degree in Biomedical Engineering.

International MS in Biomedical Engineering

The SSN-Drexel University International Graduate Program in Biomedical Engineering offers an effi-cient path towards an MS degree.

MS Degree in Chennai - Program Overview

Once admitted, students begin their studies at SSN and transfer 15 credits to Drexel University at the end of their first year. In their second year, students continue their studies in biomedical engineering at Drexel University. After taking 30 credits of classes, SSN and Drexel credits are combined to award the student an MS degree in Biomedical Engineering.

INSTINCTS

This is the cultural fest of the college, a three day extravaganza of fun and frolly in the month of March. The event has varying themes every year and all the students come together as volunteers, organisers and participants as well. This is one of the biggest Cultural Fests happening in colleges all over India! The theme for the 13th version in March 2018, was 'Around the World' and for the 14th version during March 2019, was 'Relive the 90's!'

OTHER ACTIVITIES

Apart from organising the various events, the students of the department are part of various clubs of the college including the Youth Red Cross (YRC), National Service Scheme (NSS), SSN Music Club, Dance club (N2K), English Literary Club,, Entrepreneurship Development Cell Tamil Saral Mandram, Classical Dance Club, SSN Photography club and So on.

INTERNALLY FUNDED PROJECTS (2019– 2020)

S NO	FACULTY IN-CHARGE	STUDENTS	TITLE OF THE PROJECT	AMOUNT
1.	Dr. Mrunal Deshpande	Chetana Krishnan R. (II Year) Sandhyavarshini (II Year)	Levitation of cells using homo mucous base	0.24L
2.	Ms. M. Dhanalakshmi	S. Anbu Selvi (ME - II Year) Praveen Surya (II Year) Abishek Dius (II Year)	Model and prototype of ankle foot orthosis for drop foot	0.24L
3.	Ms. M. Dhanalakshmi	T. Akshara Reddy (IV Year) Haridhra Suresh (III Year) J. Arthika (III Year)	Alternative foot brace for clubfoot correction	0.20L
4.	Ms. B. Divya	Bakhiyalakshmi (III Year)Samvardhini (III Year) Sivabaala (III Year)	Brainwave based wheelchair prototype	0.21L
5.	Dr. J. Vijay	A.R.Parvathi (III Year) B. Radhika S.(III Year) Shankharan (III Year)	Quantification and analysis of depression using brain waves	0.27L
6.	Dr. S. Arun Karthick Dr. L. Suganthi Dr. P. Balaji Bhargav	M. Logesh Kumar (II Year) R. Sherwin Robert (II Year)	Fabrication of stretchable impedance sensor using gold nanomesh	0.24L
7.	Ms. B. Divya	R. Shri Harini (III Year)A. Anusha (III Year) A.J. Rajkumar (III Year)	Wearable drowsiness detector	0.20L
8.	Dr. R. Subashini Dr. R. Govindaraj (SSN RC)	G. Poornima (II Year)	Synthesis and analysis of nanochitosan and silver nanoparticle incorporated glass ionomer cement	0.24L

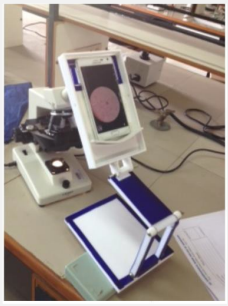
INTERNALLY FUNDED PROJECTS (2019– 2020)

S NO	FACULTY IN-CHARGE	STUDENTS	TITLE OF THE PROJECT	AMOUNT
9.	Ms. R. Nithya	Divya Rajesh Kannan (II Year) Varsha Seshadri (II Year)Yuvasri Asokan (II Year)	Stress analysis using salivary cortisol levels	0.25L
10.	Dr. L. Suganthi	Sockalingam Saravanan (II Year) R. Bhargav (II Year)	IoT-Enabled health monitoring and assistive systems for elderly and disabled people	0.24L
11.	Dr. K. Nirmala Dr. L. Suganthi Dr. R. Govindaraj (SSN RC)	S. Sonali (III Year) P. Vanthana (III Year)	Biochemical sensing system for the detection of creatinine level	0.24L
12.	Dr. Sachin Gaurishankar Sarate Ms. M. Dhanalakshmi Dr. M. Anbu Selvi (ECE)	M.C. Sai Kavya Neharika (II Year) Rebecca Maria Gnanamuttu (II Year) P. Aishwarya Ponni (II Year) Meghna Govind (II Year)	Wireless charging of medical implants	0.24L

INTERNALLY FUNDED PROJECTS (2018– 2019)

S NO	FACULTY IN-CHARGE	STUDENTS	TITLE OF THE PROJECT	AMOUNT
1.	Ms. R. Nithya	D Sutheshnna (III Year) T S Subhasri R Aarthi R Srinith (II Year)	An automatic writing stylus for the visually challenged	0.20L
2..	Dr. S. Bagyaraj	Prem Aravindhan Sandhanakrishnan-Durgadevi R Aishwarya (III Year)	Wearable device to detect Hypertension, Hypotension and Drug delivery system	0.10L
3.	Dr. Sachin Gaurishankar Sarate	Nanthini N Janaki R (IIYear)	Automatic eye drop dispenser	0.20L
4.	Dr. S. Bagyaraj	S Santhosh, Venkatakrishnan Sudharshan, R Saisrinivasan, Patrick A Joseph, S Prashanth (II Year)	EEG based brain computer interface for prosthetic hand control	0.25L
5.	Ms. M. Dhanalakshmi	SSrija, P Kawya (III Year)	Wearable reader for the visually impaired	0.20L
6.	Dr R Subashini	S Vishwanath(IV Year) Saranya, M Janani (II Year)	Portable power generating microbial fuel cell	0.22L
7.	Ms B Divya	Anupam Bhaskarbhatta, Arvindh Swaminathan (III Year)	An ankle foot orthotic device integrated with a functional electrical stimulation unit to assist and improve walking for a foot drop	0.175L

PATENTED PROJECTS



Ms. M. Dhanalakshmi M.E, Viswanath.S, Om Prakash S and Praveen kumar.G have filled a patent titled
" A COMPOSITE BLADE FOR LOWER EXTREMITY AMPUTEES "

INTELLECTUAL PROPERTY INDIA
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GOVERNMENT OF INDIA

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Department of Industrial Policy and Promotion
Ministry of Commerce and Industry

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Granted Patents | Published Applications | Application Status | Agent Register | Patent Register

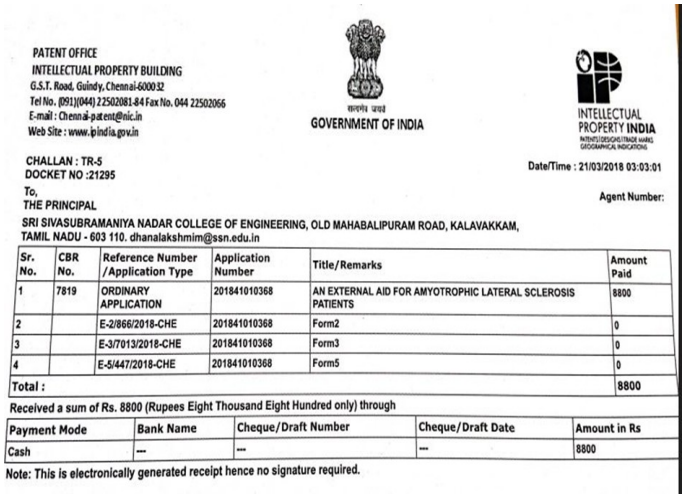
Detail

APPLICATION NUMBER	6299/CHE/2015
APPLICANT NAME	SRI SIVASUBRAMANIYA NADAR (SSN) COLLEGE OF ENGINEERING
DATE OF FILING	24/11/2015 10:43:57
PRIORITY DATE	NA
TITLE OF INVENTION	MULTI-STANCE SMARTPHONE SUPPORT FOR MICROSCOPE
PUBLICATION DATE (U/S 11A)	25/03/2016

Application Status

Request For Examination Date	24/11/2015 10:43:59
Status	Application Awaiting Examination

Print | Back Report | View Complete Specification | View E-register | View Examination Report(s) | Order(s)/Decision(s) | View Documents



PATENT OFFICE
INTELLECTUAL PROPERTY BUILDING
G.S.T. Road, Guindy, Chennai-600032
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CHALLAN : TR-5
DOCKET NO :21295

Date/Time : 21/03/2018 03:03:01

To,
THE PRINCIPAL

Agent Number:

SRI SIVASUBRAMANIYA NADAR COLLEGE OF ENGINEERING, OLD MAHABALIPURAM ROAD, KALAVAKKAM,
TAMIL NADU - 603 110. dhanalakshmim@ssn.edu.in

Sr. No.	CBR No.	Reference Number /Application Type	Application Number	Title/Remarks	Amount Paid
1	7819	ORDINARY APPLICATION	201841010368	AN EXTERNAL AID FOR AMYOTROPHIC LATERAL SCLEROSIS PATIENTS	8800
2		E-2/866/2018-CHE	201841010368	Form2	0
3		E-3/7013/2018-CHE	201841010368	Form3	0
4		E-5/447/2018-CHE	201841010368	Form5	0
Total :					8800

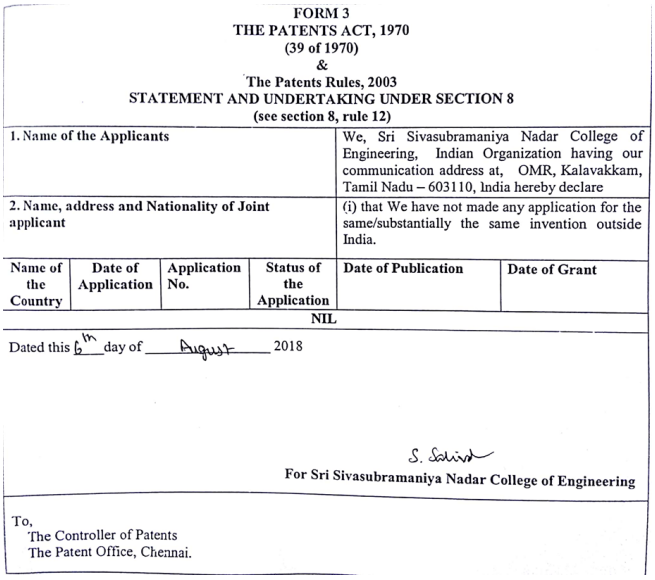
Received a sum of Rs. 8800 (Rupees Eight Thousand Eight Hundred only) through

Payment Mode	Bank Name	Cheque/Draft Number	Cheque/Draft Date	Amount in Rs
Cash	---	---	---	8800

Note: This is electronically generated receipt hence no signature required.

Ms. M. Dhanalakshmi M.E, Keziya M and Viswanath.S, have filled a patent titled
" KNEE BRACE FOR GENU RECURVATUM "

Dr A Kavitha (Head of the Department) and Ms R Nithya has filed a patent titled " Orthopaedic Belts using Sodium Acetate Crystal "



FORM 3
THE PATENTS ACT, 1970
(39 of 1970)
&
The Patents Rules, 2003
STATEMENT AND UNDERTAKING UNDER SECTION 8
(see section 8, rule 12)

1. Name of the Applicants	We, Sri Sivasubramaniya Nadar College of Engineering, Indian Organization having our communication address at, OMR, Kalavakkam, Tamil Nadu – 603110, India hereby declare
2. Name, address and Nationality of Joint applicant	(i) that We have not made any application for the same/substantially the same invention outside India.

Name of the Country	Date of Application	Application No.	Status of the Application	Date of Publication	Date of Grant
NIL					

Dated this 6th day of August 2018

S. Selvi

For Sri Sivasubramaniya Nadar College of Engineering

To,
The Controller of Patents
The Patent Office, Chennai.

PATENTED PROJECTS

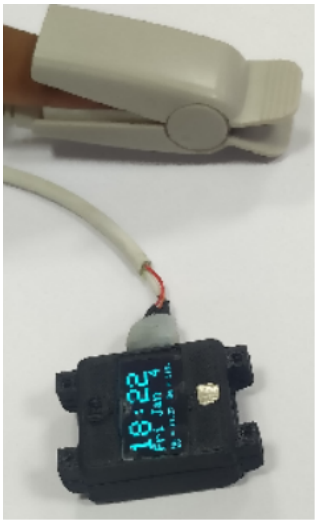
Title of the Patent: An external aid for amotropic lateral sclerosis patients
Inventors: Viswanath. S, Praveenkumar. G, Dhanalakshmi. M
Patent Application No: 201841010368
Month & year of Filing: 21.3.18
Month & Year FER was filed: Not yet
Abstract: Every year thousands of people get affected by Amyotrophic Lateral Sclerosis and drooping head conditions, that disable the people to have control over their head and neck extensor muscle. Commercially available supports impart four major hazards to the patients: suffocation, skin irritation, difficulty in swallowing, and neck soreness/pain. To reduce these adverse effects, a unique three-way support system that supports the head, neck, and chin is designed to arrest head movements such as flexion, extension, rotation and abduction. The proposed design is built incorporating essential biomechanics and ergonomics principles that provides required thrust in bringing the head upright with minimal stress zones. The system consists of a base panel, head panel and chin cap that are fabricated using polypropylene and the anterior and posterior support frames are fabricated using aluminum flat respectively. The supporting components are integrated using straps, made up of Nylon-Velcro material, facilitating effective head immobilization as well as easy portability. Coverings are provided with liner foam sheets that provide cushion support and protective covering for the users. Total deformation, safety factor and fatigue characteristics of the structural elements of the support are studied in a 3D modeling environment to understand the load distribution on the aid during actual usage through finite element simulations. No human data is collected during the simulation and all force acting on body is based on FEA simulation. The simulation results prove that the net force acting on the body-torso is negligible with minimal stress effects. This ensures all the mentioned hazards are greatly reduced in the proposed design in comparison with prior-arts.

An external aid for amotropic lateral sclerosis patients

Title of the Patent: AN ALTERNATIVE FOOT BRACE FOR CLUBFOOT CORRECTION
Inventors: S. Srija, P. Kawya, T. Akshara Reddy, M. Dhanalakshmi
Patent Application No: Preliminary patent approved (10.3.2020)
Month & year of Filing: Not yet
Month & Year FER was filed: Not yet
Abstract: Clubfoot scientifically known as CTEV (Congenital Talipes Equino Varus), is a congenital disease condition where the child presents with either one foot or both the feet rotated internally at the ankle. The treatment is the ponseti method, including a casting phase and bracing phase. The casting phase is the initial treatment phase and is a crude method by itself followed by a tenotomy and the successive step is the bracing phase. The major drawbacks of the casting phase were that there was no specific gradual angle change and secondly the removal of the plaster using water leading to the baby falling ill. The project deals with replace the casting with an easier and more technical technique using a brace. To render an alternative foot brace in order to replace the series of casts and at the same time ensures a gradual change in the foot orientation angle. The principle behind the design of a brace is 3-point pressure principle and so that the deformity would be corrected by gradually changing the foot angle. Using 3D printing technology, the brace can be customizable and made as a product. The same brace ensures the gradual change in the foot orientation angle and nullifies the relapse of the foot. Materials taken for the study are Thermoplastic Polyurethane and Carbon fiber. Further, the material properties were studied and material testing is also involved.

An alternative foot brace for clubfoot correction

Title of the Patent: An Embedded System Design for Non-Invasive Blood Glucose Measurement
Inventors: 1.Dr. Suganthi 2.Haripriya R 3.M. Nagavarshini 4.Vignesh V 5.Vignesh R 6. Sriram Shreedharan 7. Vignesh R 8.A.S.Vikram 9. R.Jyothiraditya
Patent Application No: 201941006594
Month & year of Filing:20/2/2019
Month & Year FER was filed:
Abstract:The present invention explains about the non-invasive way of blood glucose, haemoglobin measuring device using Photo plethysmography (PPG) in the near infra-red range. The device measures the blood glucose and haemoglobin level based on the output of the detector. A clip-based device consists of a dual wavelength LED which acts as a light sensor and it is inserted into the finger of the individual. The photoplethysmography is an optical technique that measures the pulse rate, arterial blood oxygen saturation and the blood volume changes and it uses a clip type device which contains a light source and a detector on the opposite sides to detect the cardiovascular pulse wave that propagates through the body. The photo-detector detects the incident light from the device and amplifies it with the help of an amplifier and it also converts the light into either current or voltage. Then, the amplified signal is sent to the microcontroller by converting the analog signal to the digital signal with analog to digital (ADC) converter. The microcontroller process the signal to determine the peak voltage. The final validation is done by comparing the obtained blood glucose and haemoglobin level results with the existing glucose and haemoglobin measurement methods. After comparing the results with the existing glucose and haemoglobin measurements, the voltage values are obtained and then it is converted to the equivalent glucose and haemoglobin values using regression equations and then the results are displayed in a OLED .



An Embedded System Design for Non-Invasive Blood Glucose Measurement

PATENTED PROJECTS

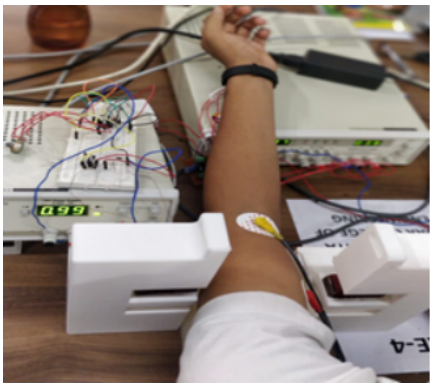
Title of the Patent: 3 D printed Prosthetic Arm
Inventors: Dr. A. Kavitha, Ms. R. Nithya,
Patent Application No: 201941031286
Month & year of Filing:2/08/2019
Month & Year FER was filed: not yet
Abstract: The 3D printed prosthetic arm is a completely functioning artificial hand with 18 degrees of freedom which includes exclusive lateral movements of the fingers. The gear mechanism which allows lateral movements between various fingers is its main USP. Grasp, hold and squeeze operations of different sized objects are possible due to its high functional characteristics. The fingers are moved using servo motors and the functions are externally controlled.

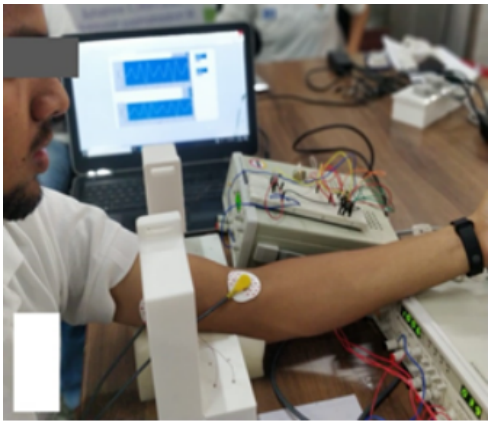
3 D printed Prosthetic Arm

Title of the Patent: IMPLANTABLE BATON ANTENNA USING COPLANAR WAVEGUIDE (CPW) FEED
Inventors: Mahalakshmi N, Thenmozhi A, Vijay J
Patent Application No: 201941035032
Month & year of Filing:30/08/2019
Month & Year FER was filed: Not Yet
Abstract:The scope of the present invention is defined solely by the appended claims and is not affected to any degree by the statements within this summary. The present embodiments may obviate one or more of the drawbacks or limitations in the related art. Embodiments provide a novel Implantable Baton Antenna for Medical Application. For this, the antenna should be designed with increase in reflection coefficient, and decrease in gain and it should be in the ISM band (Industrial, Scientific, Medical band) .Generally the size of bio-medical antennas are large in size to obtain less amount of gain. Our proposed antenna design is for Implantable Baton antenna with CPW (coplanar waveguide) feed. The Antenna is constructed on substrate ROGERS 6010 to get the high dielectric constant (10.2). The antenna is designed with the size of 10x 10x0.365mm 3 .The total thickness of the antenna is 1mm. when compared to other biomedical antennas it is small and comfortable to use. The return loss of our antenna is -21.26 dB at a frequency range of 2.45 Ghz. For that we obtain a gain of -14.50dBi.when compared to other antennas this gain is low. The VSWR (Voltage standing wave ratio) for our designed antenna is below 2.we can conclude that the above implantable antenna is perfectly matched for the recent trend in diagnostic or therapeutic functions .

Implantable baton antenna using coplanar waveguide (cpw) feed

Title of the Patent: Continuous Non-invasive blood pressure(NIBP) Measurement based on Electro-motive Force(EMF)
Inventors: GE Healthcare and SSN College of Engineering- Zuber Ahmed(GE), Dr.B Geethanjali, Saikiran S, Suhashine S, Vishaal Venkat, Sriram V, Sabharish M, Varshini V
Patent Application No: 89324522
Month & year of Filing: 12.07.2019
Month & Year FER was filed: Not Yet
Abstract: The measurement of Blood pressure for years has been done by the auscultatory method, where a trained person inflates a cuff around the patient and identifies the highest and lowest values of pressure during the cardiac cycle and there is a growing need to create awareness and have the right means to calculate blood pressure. The idea is based on the principle of magnetic blood flow meter and when the arm placed inside the region of the magnetic field there is an EMF produced due to the flow of blood in the artery. The output of this stage is fed into the signal conditioning circuit and the final systolic and diastolic blood pressure values are obtained with maximal accuracy. The results were analyzed with the traditional sphygmomanometer and the digital sphygmomanometer which indicates that when miniaturized into compact models the device can measure blood pressure continuously and non-invasively and is capable of replacing the current cuff method as the accuracy of the device is maintained and errors were also in the tolerance range with minimal contact with the patient's skin.





Continuous Non-invasive blood pressure(NIBP) Measurement based on Electro-motive Force(EMF)

PATENTED PROJECTS

Title of the Patent: Automated Weight Measurement Based on Anthropometry
Inventors: Kavya V.Kannan, Kezia Sharon, Ananya, Vaishali, Arvind, Jagadesh, Mahesh V.
Patent Application No: 202041009649
Month & year of Filing: March, 2020
Month & Year FER was filed:
Abstract:Normally weight of the bed-based patients in the hospitals is estimated by visual approximation, previous records and by asking their family members which leads to medication errors and cause even death. Accurate weight measurement of the bed-based patients is required for the nutritionists so that they can prepare diet charts based on that. A fitness enthusiast frequently estimates their weight in order to keep them fit and healthy. Most of the people and bed-based patients use load cell for measuring weights but the drawback in this system is it is more expensive, and installation of load cell is more difficult since the bed placed in the hospitals has to be designed accordingly. The present invention describes a system to estimate the weight of the persons and even bed-based patients based on the anthropometry measurements. A body weight of the patients is estimated based on the anthropometric measurements such as knee to foot (KTF) length and middle upper arm circumference (MUAC) which is measured using an IR sensor. A formula for estimating the body weight using two anthropometric measurements is derived using regression analysis by correlating the knee to foot (KTF) length and middle upper arm circumference (MUAC) which is obtained from a wide range of population with weight. the body weight of the patient is measured by anthropometric methods through IR sensor, and the result is compared with the patients' actual weight. The project achieved accuracy of 95 % which was acceptable by doctors.

Automated Weight Measurement Based on Anthropometry

Title of the Patent: An enhanced carbon dioxide sorbent nanofibre membrane and a device thereof
Inventors: Thalappil Pradeep, Anagha Yatheendran, Ramesh Kumar, and Arun Karthick S
Patent Application No: 201841031076
Month & year of Filing: 20/8/2018
Month & Year FER was filed: 25/5/2020
Abstract: An AEAPTMS (N-[3-(Trimethoxysilyl) propyl] ethylenediamine) /aminoethyl-aminopropyl trimethoxysilane polyacrylonitrile (PAN) based electrospun nanocomposite material for CO2adsorption and air purification is proposed. The material has CO2capture capacity of 0.77 mmol/g at 24°Cand 70% relative humidity or in air-conditioned environment with 100% regeneration capacity at near ambient temperature.

An enhanced carbon dioxide sorbent nanofibre membrane and a device thereof

Title of the Patent: Multi stance smartphone support for microscopes
Inventors: S. Saravana Prakash, S. Pravin Kumar and S. Rajendiran
Patent Application No: 6299/CHE/2015
Month & year of Filing: 24/11/2015
Month & Year FER was filed: 26/06/2019
Abstract: The present invention is a multistance smartphone support for microscopes which discloses a support for the smartphone to connect with microscopes of different makes. More particularly, this invention relates to a versatile multi stance support, which can be adapted to different positions that avoids hand jerks associated with conventional frames. The present invention can be used with all types of smartphones and microscopes. More importantly, the device will be useful to take images and videos for presentation to the scientific community, clinical and academic laboratory-setup which includes human, animal and plant physiology, anatomy and pathology labs where microscopic examination of processed tissue of human and non-human sources is carried out for teaching and research purposes in addition to diagnostic work up. This invention provides a stable, flexible, and convenient fixation of smartphone for efficient pathological examinations, thereby reducing the fixation timings and parfocality optical errors associated with improper hand supported mounting.

Multi stance smartphone support for microscopes

MOUs

Drexel University

Birmingham City University

NIEPMD

Wildbox Technologies

neolight

Aries Biomed Technology

SRM Institute of Science & Technology (Deemed to be University u/s 3 of UGC Act, 1956)

HIGHER STUDIES

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Cognitive Neuroscience

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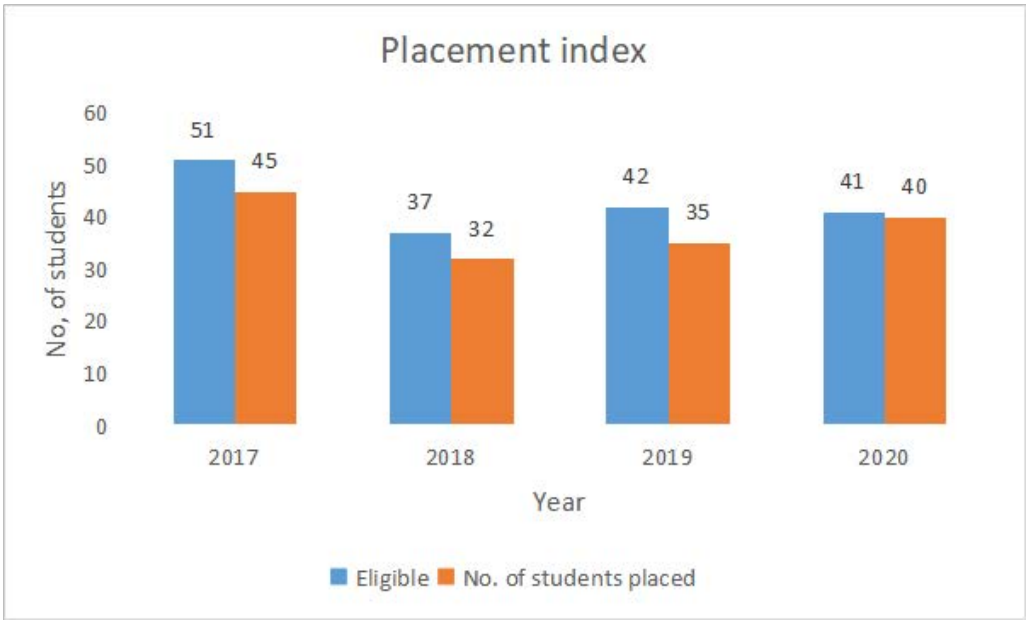
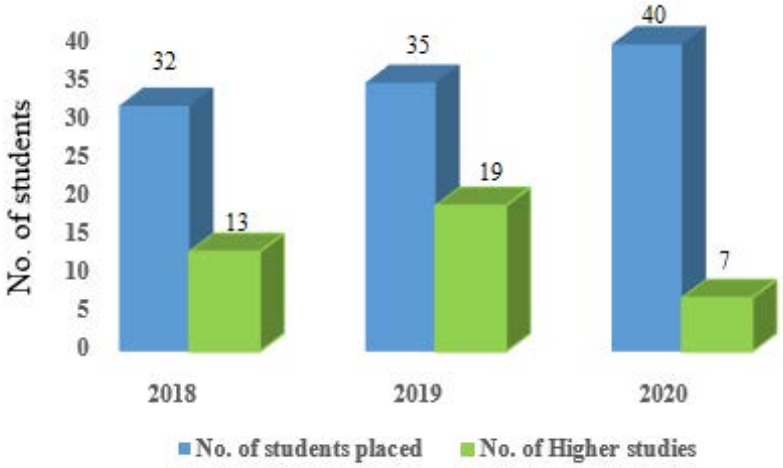
PLACEMENTS AND HIGHER STUDIES





This year's placements began with a great amount of energy from the students, placement cell and the department!

First off, Super dream companies started coming followed by core companies, and dream companies. The students of the department of Biomedical Engineering have proved themselves in the past 3 months by setting a good placement record.

The first company where our department student got placed is Mckinsey and company, which is one of the top business consultancies in the world. One student from the department got placed as a Junior Research Analyst for a super dream offer. Following that was latent View infotech, looking for data analysts. Four data enthusiasts of our department got a dream offer from the renowned firm. Given the strength of the department, 4 offers out of the 18 offers, was a positive sign indeed. Thus grew the impetus and enthusiasm shown to placements by our students and faculty.

Next up was a core company called Zifo which is a pharmaceutical research oriented company. 5 students bagged offers after a rigorous interview process. This was followed in parallel by the campus process of ZoomRx, where 2 students got placed as business and community associates respectively. Then, was Philips, 3 students got placed for the role of Application specialist Trainee.

DISTINGUISHED ALUMNI AWARD

From the year 2018 SSN has instituted the Distinguished Alumnus Award which will be awarded to an alumni of SSN who has displayed significant achievements in his chosen profession and displayed commitment towards the mission of SSN. Sivakumar Palanisamy, co-founder of healthcare startup, Neolight in the United States was presented the distinguished alumni award SSN College of Engineering in Chennai. His startup as featured in the Forbes list of innovative startups in 2016. He has also invented a socially relevant product- Smart Walking Cane for visually challenged

My journey towards an interest in Biomedical Instrumentation incepted on the ground floor laboratory of our biomedical department. I thoroughly enjoyed my four years at SSN from 2007-2011 and graduated with an opportunity as an R&D engineer. Empathy and continuous support for students was in abundance from the faculty members and created the drive for students. It is the key factor that shaped my life as they supported through different facets of my life, even today. After experiencing science overseas, I am confident that SSN's Biomedical Department has an infrastructure designed to prepare opportunistic individuals with the amenities of world-class resources not limited to faculty members, laboratories, multi-dimensional research, exposure to modern technologies, industry support, recognition, and fun. I'm currently one of the founders of Neolight, a multi-million $ enterprise manufacturing empathy driven medical products in the neonatal field located in USA.

Looking back seven years, our beloved Biomedical department reminds me of challenging and happy memories. I wish the best for everyone in all their endeavours and utilize the alumni group to experience continued support.

Best Regards,
Sivakumar Palaniswamy
Co-founder & CTO, Neolight LLC

ALUMNI TALK

Hi Everyone,

The Department of BME in SSNCE has given me a lot of fruit-ful memories. Regarding my experiences, the department has shaped me from no one to what I am up to now. When I entered my second year I realized this field is different and thanks a lot to my evergreen mentor Dr. S. Pravin Kumar, who is my constant supporter, encour-ager and advisor till date. The department gave me a powerful tool called IEEE EMBS which helped me to network and communicate to relevant big shots. The department was behind me during three In-ternally funded projects and an institutional patent. Words cannot describe the benefits and experiences I enjoyed working in labs, the staffs and lab assistants were helpful like they stay extra time if I say I need to work. They surprised me with an award as the 'Best student of the department 2016' during the annual meeting of Association of Biomedical Engineers which I will never forget forever. On the whole, I personally thank each and every single staff and student for such lovely memories. I will always remain grateful to BME SSNCE and I am happy to help my fellow jun-iors in future.

With sincere regards,
Saravana Prakash Shanmugasundaram
Student intern –Globalfoundries GmbH,
Research Assistant– Leibniz Institute for Polymer

I would describe the Biomedical Development of SSN as exciting, dynamic and innova-tive. It has been a great contributor towards the development of my personality. By motivating and providing me opportunities to participating in various National Level Events and Innovation Challenges, I have established my leadership, time management and team skills and have also been able to advance these skills to whole new augment level which eventually inspired me to become successful entrepreneur.

The infrastructure of the department is one of the finest and is what stands out the most. Our HOD and faculties make the bio-medical department what it is today. With an attitude of being ever ready to help, not only delivering classroom teachings, but also providing the students with real-time case studies and hands on industry experience with field project works, they are the pillars of the learning gained from this esteemed college and this is a treasure for our student's life.

I feel the best thing about being a student here is the number of additional opportuni-ties that are available. I was initially attracted here by the department's reputation, and my career goals, but I realized the best thing about this department is having the free-dom to think of an idea and test its practical application. I feel extremely lucky to be in an environment that allows me to conduct research on what interests me the most, so in all my time I have never felt bored.

To any new student coming to this department, I would say this: Throw yourself at every opportunity that comes your way, those opportunities can make all the differ-ence between getting what you want and having to settle for what you get.

BEST WISHES,
DEEPAK

COLLEGE DETAILS:

CAMPUS :

SSN Institutions, Old Mahabalipuram Road,
Kalavakkam-603110,TamilNadu,India.
Phone:044-27469700
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211/95,V.M.Street,Mylapore,Chennai-600004
Phone:044-24986474/ 044-24982656
Fax:044-24982656

DEPARTMENT OF PLACEMENT& TRAINING

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