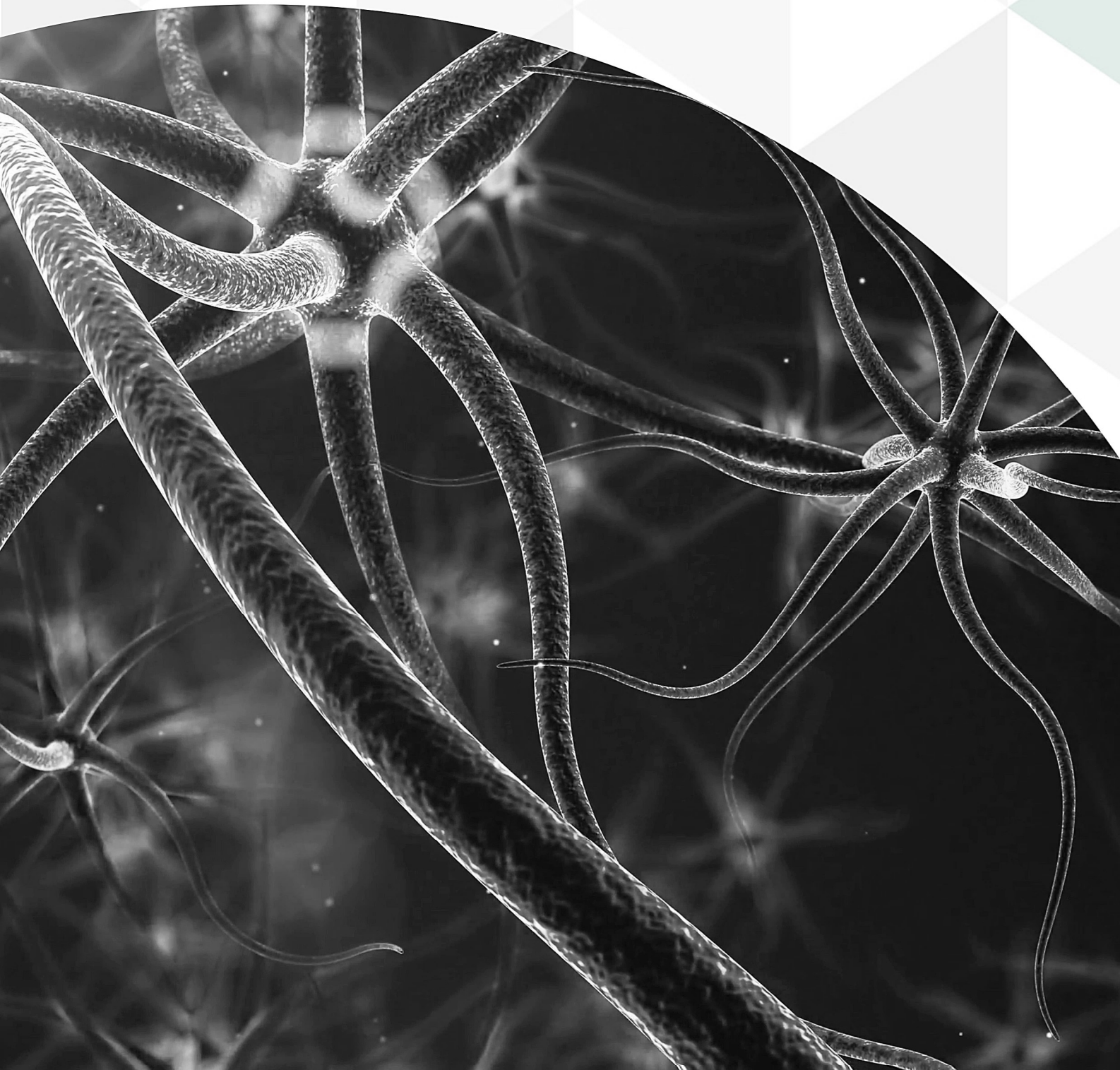
BMS COLLEGE OF ENGINEERING
BANGALORE - 560019

Department of Medical Electronics

Synapse 2018




PARTMENT OF MEDICAL ELECTRONICS

SYNAPSE 2018

"The point where the greatest change seems to take place is at the synapses, but what this modification is, no one knows."
-George Drayton Strayer and Naomi Norsworthy.

Synapse is a collaborative effort of the faculty and students of Department of Medical Electronics, BMSCE.

Apt to the name of the magazine, this is an effort to connect all the details of the Department, activities, and achievements of the students and faculty.

The main aim of the magazine is to put together the Department's, students' and faculty's life, at BMSCE.

Dear readers,

Presenting to you , Synapse.

CONTENTS:

HOD's Message

FROM THE CHAIRPERSON

Dear Readers,

I am honored to be a part of this revamped magazine, **'Synapse 2018'** .I am particularly heartened by the contributions received from the faculty, the students and the stakeholders of the department, which shows their great support towards this magazine. This also implies that there is great interest and enthusiasm in wanting to engage in scientific exchange, along with showcasing hidden talents.

On behalf of the magazine committee, I would like to thank you all for the contributions towards the success of this magazine.

As you flip through the pages of the magazine, you can see various interesting articles from the faculty, students and stakeholders, in terms of sharing their valued technical articles, artwork, technical activities, the experience of the graduating batch of 2018, innovations at CIME, academic achievements, etc. This is to motivate the stakeholders of the department and for the consumption of anyone, who is interested in Medical Electronics Engineering.

It is important to keep abreast on the latest technologies in the field of Biomedical Engineering and also update ourselves on the achievements and activities of the department - this is where the magazine comes into play, acting as the link between us and the new developments. It also acts like a stress buster for the students, and members of the faculty alike, who are all caught up either in preparing for examinations, or teaching classes. In such a busy environment, one often loses track of the latest research, and progress.

The magazine brings together two worlds- Technical and Creative. Please use this magazine as a platform to present your work, perhaps for the first time, to ask questions (technical or otherwise) to like-minded students, and above all, to enjoy yourself by contributing to future editions of Synapse. I sincerely hope that this magazine marks the restart of a series of contributions that we will bring forth year after year.

Best Wishes,

Abhishek Appaji M

FROM THE EDITOR-IN-CHIEF

"Growth is never by chance ;
it is a result of forces working together ."

The journey of our magazine started with the formation of a committee consisting of teachers, who were our guiding light, students, who took up different roles, and mentors, who helped us through this.

Branching ourselves out and taking up our respective responsibilities, we started our work in the month of February 2018. It took us a good six months to put together the magazine and bring it to this form.

We gained a lot of experience, learnt the art of working with each other and with ourselves.
We were able to overcome many obstacles during this course, which helped us improve the magazine a little more every time.

I would like to take this opportunity to thank the faculty of the Department of Medical Electronics for their extended support.
I express my heartfelt gratitude to the mentors, fellow classmates and all content writers who helped pull this magazine together.
I would like to thank my team members for their efforts in putting this magazine together.

Shruti G A
Editor-in-chief, 2018

HELLO FROM THE TEAM

The responsibility of bringing out this edition of the department magazine was bestowed upon our shoulders.

Excitement levels were soaring, ideas were overflowing. With a lot of enthusiasm, we began the work; very eager to put out our ideas, and see them take form.

However, as the days went on, it dawned upon us, the herculean task we had taken upon.

A little shaken up, but determined, nevertheless, we began the mountainous effort of co-ordinating, acquiring, running amok, editing, approving, deciding, re-editing, and finalising—to come to this result, in your hands.

This magazine would not have seen the light of day, had it not been for the continuous support and encouragement from our Head of the Department, and the Chairperson of the magazine and also, for the co-operation, from our teachers. Thank you all for your support.

Without teamwork, there is nothing possible. That is one of the biggest lessons that we learnt throughout this period. There were a few testing times, but we managed to pull through with our head held high- a team effort! So, now, we leave you with these wise words from Professor Albus Dumbledore-

"Nitwit! Blubber! Oddment! Tweak!"

THE TEAM:

Abhishek M Appaji - Magazine Chairperson

Shruti G A - Editor in chief

Naina Somsundar- Editor

Sharadhi U Bharadwaj - Designer

Vishruth Cavale- Member

Medha B N -Member

Aishwarya H K-Member

Kiranmayee Bavanasi -Member

Meghna Kulkarni -Member

Suman S Murthy-Member

Anvitha A Rao-Member

ABOUT THE DEPARTMENT

The Department of Medical Electronics was established in 1992 to expand its academic horizon in the fast-growing field of healthcare technologies. Having batch strength of around thirty and with an experienced faculty. The focus to impart synergistic education in the field of medical electronics and life sciences to translate it into real world applications. The institution has thus been able to contribute a large pool of talented biomedical engineers into the industry. The department also hosts M.Tech in Biomedical Signal Processing and Instrumentation.

We believe that collaboration is everything. Thus, the department has various collaborations with major research institutes like Stanford University, Oxford University, Masstricht University, Indian Institute of Science, Narayana Nethralaya, Kempegowda Institute of Medical Sciences and many more.

FACULTY

1. DR. S B BHANU PRASHANTH	PROFESSOR AND HEAD
2. DR. H N SUMA	PROFESSOR
3. DR. MAHABALESHWAR R BHATT	PROFESSOR
4. DR. M S SUMA	PROFESSOR
5. S Y PATTAR	ASSOCIATE PROFESSOR
6. DR. K VIJAYALAKSHMI	ASSOCIATE PROFESSOR
7. B N BEENA ULLALLA MATA	ASSOCIATE PROFESSOR
8. R KALPANA	ASSISTANT PROFESSOR
9. DR. MANISHA S JOSHI	ASSISTANT PROFESSOR
10.K R NIRANJAN	ASSISTANT PROFESSOR
11. ABHISHEK M APPAJI	ASSISTANT PROFESSOR
12. R S ANANDATHIRTHA	INCHARGE FOREMAN
13. G L VENKATESHA	INSTRUCTOR
14. PANDURANG KULKARNI	ASSISTANT INSTRUCTOR
15. M GUNESHWARA	SDA
16. BASAVARAJU	HELPER

The only place where success comes before work is in the dictionary.
-May Smith

ACHIEVEMENTS

DR. S B BHANU PRASHANTH

PROFESSOR AND HEAD

Technical Book

- M.S. Suresh and S.B. Bhanu Prashanth, "**Linear Integrated Circuits - Concepts and Applications**", Prism Publishers, February 2011.

Journals

- S.B. Bhanu Prashanth and S. Asokan, "**A Programmable High Voltage Electrical Switching Analyzer for I-V Characterization of Phase Change Materials**", **2**, JINST T07003, pp 1-10 (July 2007)
- S.B. Bhanu Prashanth and S. Asokan, "**Composition dependent electrical switching in $Ge_xSe_{35-x}Te_{65}$ ($18 \leq x \leq 25$) glasses - the influence of network rigidity and thermal properties",** Solid State Communications, **V147**, Issue 11-12, pp 452-456 (September 2008)
- S.B. Bhanu Prashanth and S.Asokan, **"Effect of antimony addition on the thermal and electrical switching behavior of bulk Se-Te glasses"**, Journal of Non-Cryst. Solids, **V355**, Issue 3, pp 164-168 (February 2009)
- S.B. Bhanu Prashanth and S. Asokan, **"A composition dependent thermal behavior of $Ge_xSe_{35-x}Te_{65}$ glasses",** Journal of Non-Cryst. Solids **V355**, Issues 22-23, pp 1227-1230, (July 2009)
- Farheen Choudhary and S.B. Bhanu Prashanth, **"Design of a Low Cost Data Logger - based on ARM7LPC2148"**, Journal of the Instrument Society of India, **V44**, No 3, pp188-191 2 (September 2014)
- P. Venkat Rao, S.B. Bhanu Prashanth, **"Impact of Residual Dispersion and Power in The Presence of Nonlinearities in RZ Optical Link"** , IJIREEICE, **V4**, Issue 6, pp116-119, (June 2016)
- Atheeth S, Bhargav Anur Krishnaprasad and S.B. Bhanu Prashanth , **"Pulse Rate Monitor at Pinna"**, **V4**, Issue 6, International Journal of Engineering Research in Electronics and Communication Engineering (IJERECE), Institute For Engineering Research and Publication (IFERP), pp 138-140, (23rd June, 2017).

Conference Publications: 15

Research Activities: Guiding five PhD scholars in the areas of Communication.

Research Grant Received: Chief investigator for the research grant of Rs.20 Lakhs, obtained from VGST, GoK under KFIST- Level 1, for the years 2012-2014. The research work was on the measurement and compensation of dispersion in Optical Fibers.

Memberships in Professional Bodies: Instrument Society of India (ISOI), Institute of Smart Structures and Systems (ISSS), and IEEE

Dr. H N SUMA

PROFESSOR

- **Member**: BOG, B M S Educational Trust
- **Chief coordinator**: Center for Innovation, Incubation & Entrepreneurship (CIIE), BMSCE.
- **Chief coordinator**: Student Satellite Project, BMSCE
- **Mentor**: Phase Shift 2018
- **Member - Academic Council**:
    - Siddaganga University, Tumkur
    - Dayanand Sagar University, Bangalore
- **Member - Board of Studies**:
    - Dr Ambedkar Institute of Technology
    - Ramaiah Institute of Technology
    - University Visveswaraiah College of Engineering
- **Funded Projects**: Total amount received till date: **129 lakh**
    - **'Infrastructure Enhancement of Biomedical Wireless Data Acquisition Facilities in Biomedical Signal Processing Lab'**. Amount Sanctioned :Rs. 20 Lakhs. Funding agency :Vision Group on Science & Technology
    - **'Development of Low Cost, Safe,High Resolution, Easy to use Digital X-Ray'**. Amount Sanctioned: Rs. 59 Lakhs. Funding Agency: Department of Science & Technology.
    - **'Smart Eye Kiosk for Community (SEK-C): Smart fully automated ophthalmic camera for community eye screening'**. Amount Sanctioned: SGD 99,989.00. Funding Agency :Ng Teng Fong Healthcare Innovation Programme (NTF HIP), Singapore.
- **Patents filed: Three**
    - 201741043874: **'A Foldable Back Support Structure for a user and a Medical Kit Thereof'** . Filing Date :07/12/2017
    - 201741001029: **'Digital X-Ray Device and a Method Thereof'** . Filing Date:10/01/2017
    - 3298/CHE/2014 : **'Method, Image Processing Component and Apparatus for Identification of Strabismus Condition in Eye'** . Filing Date: 03/07/2014.
- **PUBLICATIONS:**
    - **Journals: 14**
    - **Conference papers: 23**
    - **Awards: 2 – Best paper awards**

Dr. MAHABALESHWAR R BHATT

PROFESSOR

PATENTS

- **Method and apparatus for automatic gain control** - US2009/0252347, October 08, 2009.
- **A method and system to identify intraocular pressure (IOP) of an eye**, Indian Filing 2831/CHE/2011/18.08.2011 and WIPO/PCT Publication no: PCT/IB2012/054134/14.08.2012 (WO2013/024431), US Application No: 14/114,917, (work carried out as part of Forus Health Pvt. Ltd., Bangalore).
- **Pulse code modulation conversion circuit and method** –US 8,462,026 B2 June 13, 2013
- **Method and system for enhancing image quality**, WIPO/ PCT Publication No: PCT/IB2012/054713/21.03. 2013(WO2013/038333), US National Phase application no: US 14/131,979, dated Jan 10, 2014, Indian National Phase ref no: 60/CHENP/2014, date Jan 03, 2014 (work carried out as a part of Forus Health Pvt. Ltd., Bangalore)
- **An image processing method and apparatus for correcting an image**, Indian Filing 5167/CHE/2012/12/12/2012, US national Phase Application no: US 14/103957, submission date: Jan 23, 2014 (work carried out as a part of Forus Health Pvt. Ltd., Bangalore).

CONFERENCE PAPERS

- '**A memory and computation efficient synthesis sub-band filter bank for mpeg audio decoding'**, 116th AES Convention held at Berlin, Germany in 2004.
- '**Automatic analysis of hyper-spectral imaging for early detection of diabetic retinopathy'**, Leading In Leaning Workshop, Maastricht University India Institute, Bangalore, April 2011.
- **'Imaging based non-contact tonometer for intraocular pressure measurement'**, Proceedings of IEEE-EMBS Special Topic Conference on Point-of Care (POC) Health Care Technologies, Bangalore, pp., January 16th -18th , 2013.
- **'Cost effective ocular public screening device for paediatric eye disorder estimation using photo-refraction'**, An approach paper presented at Photonics West 2013, January 2013.

WORKSHOPS COORDINATED

Biannual International Conference on Signal Processing and Communication, (SPCOM) , jointly with IEEE and IISC), 2004.

RESEARCH PAPERS

- **'Robust image restoration using markov random field model'** , in Journal Computer Vision - Graphics and Image Processing, pp.8-16, in 1995.

Dr. SUMA M S

PROFESSOR

PATENTS

- Ravi Talwar, Suma M.S – **'Design and implementation of sleepy stack static random access memory'**, filed for Indian patent 2012.
- **Through silicon via modeling and related thermal solutions for future generation 3D-ICs** .2 filed for India patent 2016.

AWARDS

- **Awarded for research publication** from RSST, Jan 26th 2012.
- Mentored for the project – **'Automated Waste Segregator'**, which won the **Chairman's Award** at the Texas Instruments Innovation Challenge India: Analog Design Contest 2014.(Cash prize of 10,000 USD)
- **Awarded for research publication** from RSST, Jan 26th 2014.
- **Certificate of Recognition** awarded in recognition of the abstract titled – **'Turtle base and fin perforation effects on the thermal performance of a heat exchanger'**, presented at CISCO Design Innovation Conference 2016, Bangalore, India.

BOOKS

- **CMOS VLSI Design - A Simplified Approach** , New Age International Publishers Pvt. Ltd.

SESSION CHAIR

- **Session chair** at KSIT, Bangalore for the 2nd International Conference on VLSI and Signal Processing, during August 2014.
- **Session chair** at Rajarajeswari College of Engineering for the National Conference on VLSI, Communication & Signal Processing 2015, held on 11th May, 2015.

JOURNALS

- Krishna B, Suma M.S, **'Implementation of 2 Gbps clock and data recovery circuit using PLL with high jitter tolerance'**, published in IJAERD, Volume 02 Issue 02, February 2015.

INTERNATIONAL CONFERENCES

- Amrutha Chandramohan, Joyal Mendonca, Nikhil Ravi Shankar, Nikhil U Baheti, Nitin Kumar Krishnan, Suma M S , **'Automated waste segregator'**. Paper has been accepted for inclusion in the final proceedings on IEEE Xplore and they are working on archiving the papers on IEEE Xplore and expect this activity to get completed over a period of next 6 months.

NATIONAL CONFERENCES

Dhiman,Suma M.S, **'Design and Verification of Power Management Module'**, National Conference on Power, Control, Communication and Instrumentation leading to Sustainable Technologies-NCPCCI-5, 24th -25th April, 2015,RVCE,Bangalore.

S Y PATTAR

ASSOCIATE PROFESSOR

JOURNALS

- S Y Pattar - **'Impulse noise removal technique using variation norm for medical images'**, IJSRP Volume 2 Issue 9, September 2012, 2250-3153
- S Y Pattar - **'Image denoising techniques using wavelets'** , IJIRSET, volume 2, issue 12, December 2013 edition. ISSN 2319-8753.
- SY Pattar - **'Study of corner detection algorithms and evaluation methods'**, IJIRSET, volume 4, issue 5, May 2015 edition. ISSN(Online): 2319-8753 , ISSN(Print) :2347-6710.
- S Y Pattar, Akbar Ahamad - **'Efficient extraction and reconstruction of foetal electrocardiogram by block sparse bayesian learning',** International Journal for Scientific Research and Development (IJSRD), Vol.3, Issue 07, 2015, ISSN(online): 2321-0613,
- Pavithra R, S Y Pattar – **'Detection and classification of lung diseases- pneumonia and lung cancer in chest radiology. using artificial neural**, International Journal of Scientific and Research Publications, Volume 5, Issue 10, October 2015, ISSN 2250-3153.
- Anantha Padmanabha A.G and S.Y Pattar – **'Textural feature extraction and analysis for brain tumours using MRI'**, International Journal of Scientific and Research Publications, Volume 7, Issue 8, 2017, ISSN 2250-3153.

Dr. K VIJAYLAKSHMI

ASSOCIATE PROFESSOR

AWARDS

- Presented a paper – **'Quantitative analysis of EEG signal before and after Sudarshana Kriya Yoga'**, in the International Conference on Public Mental Health and Neuro Sciences, on 18th and 19th December, 2014, organized by Sarva Sumana Association and AZyme Biosciences, Bangalore. **Awarded III Prize** for the Paper Presentation.
- Participated and Presented a paper on **'Miraculous effect of Sudharshana Kriya Yoga on Brain Signals: A Scientific Approach'**, in National Conference on 'Stress and Health :A Frontiers of Research in stress related Diseases and Management', organised by Department of Zoology, Maharani's Science College for Women, Bangalore on 12th and 13th of February 2015, SHDM(2015). **Awarded III Prize** for the Paper Presentation.

MEMBERSHIP TO THE PROFESSIONAL BODIES

- **Life Member** of Indian Society for Technical Education (ISTE)
- **Life Member** of BioMedical Engineers Society of India (BMESI)

INTERNATIONAL CONFERENCE PAPERS

- **'Estimation of effects of alpha music on EEG parameters by time and frequency domain analysis'**, International Conference on Computer and Communication Engineering, held in Kuala Lumpur, Malaysia, from May 11th -13th , 2010.

- **'Quantitative analysis of EEG signal before and after Sudarshana Kriya Yoga'**, International Conference on Public Mental Health and Neuro Sciences, 18th and 19th December 2014, Sarva Sumana Association and AZyme BioSciences, Bangalore. **Awarded III Prize**.

- **'Miraculous effect of Sudarshana Kriya Yoga on Brain Signals: A Scientific Approach'**, National Conference on 'Stress and Health : A frontiers of research in stress related diseases and management', Department of Zoology, Maharani's Science College for Women, held on the 12th and 13th of February, 2015. **Awarded III Prize**.

INTERNATIONAL JOURNAL PAPERS

- K. Vijayalakshmi, S. Ramachandran and M. Chandrasekaran – **'Independent component analysis of EEG signals and real time data acquisition using MyDAQ and Labview'**, International Journal of Innovative Research in Advanced Engineering [IJIRAE], Vol. 1, No. 9, pp. 65 -74, ISSN: 2349-2163, October 2014.

- K. Vijayalakshmi, S. Ramachandran, and M. Chandrasekaran –**'FPGA based reconfigurable memory interface design for EEG data acquisition'**, IOSR Journal of VLSI and Signal Processing (IOSR-JVSP), Vol. 4 (6), pp. 47-55, Dec. 2014.

BEENA ULLALA MATA B N

ASSOCIATE PROFESSOR

INTERNATIONAL CONFERENCE PUBLICATIONS

- Mrs. B N Beena Ullala Mata, Dr.M.Meenakshi, titled -**'Classification of breast parenchyma tissue as an initial step in CAD (Computer Aided Diagnosis) of breast cancer'**, Second International Conference on Signal and Image Processing (ICSIP-2009), held at VVIET, Mysore, from 12th-14th August, 2009.
- Mrs. B N Beena Ullala Mata , Dr.M.Meenakshi, Dr.H.S.Sheshadri, titled –**'Automated classification of parenchymal tissue in CAD (Computer Aided Diagnosis) of breast cancer using neural network'**, in International Conference on Signals, System and Communication, organized by Department of E &C ,Guindy Campus, Anna University, Chennai, held from 21st -23rd December, 2009.
- Mrs. B N Beena Ullala Mata, Dr.M.Meenakshi, titled –**'A novel approach for automatic detection of abnormalities in mammograms'**, in International IEEE Indexed Conference –RAICS 2011, Trivandrum, organized by IEEE Kerala section, India, held from 22nd-24th September, 2011.

NATIONAL CONFERENCE PUBLICATION

- Mrs. B N Beena Ullala Mata, Dr.M.Meenakshi, titled - **'Automated texture segmentation of mammogram images'**, in National Conference, held in NIMHANS, conducted by MVIT, Bangalore, during 13th-14th October, 2010.
- Giridhar M, Beena Ullala Mata B N - **' Portable tissue optical imaging system'**, National Conference on Trends and Innovations in Automation, Materials and Thermal Engineering (TIAMTE) - 2015, held on 22nd May 2015, at VTU PG Center, Hanchya Sathagali, Mysuru.

JOURNAL PUBLICATIONS

- Priyanka A D, Dr.Subhash Narayanan, Beena Ullala Mata B N - **'A survey on development of screening device for oral cancer detection'**, International Journal of Scientific and Technical Research in Engineering(IJSTRE),Volume 1, Issue 3, June 2016.
- Beena Ullala Mata B N, Dr.M.Meenakshi, titled- **'Mammogram image segmentation by water shed algorithm and classification through K-NN classifier'** Volume-8, March 2018, in the Bonfring International Journal of Advanced Image Processing
- Beena Ullala Mata B N and Mrs. M. Meenakshi titled –**'Comparison of k-NN & Naïve Bayes Classifier for the abnormality detection of mammogram images'**, in International Journal of Advances in Wireless and Mobile Communication ,Volume 11, Number 1, 2018, page 69-74, Special Issue on International Conference, ICAST 2018, 6th-7th April, 2018, in association with University of Mumbai and IET,UK.

KALPANA R

ASSISTANT PROFESSOR

CONFERENCES

- **'Simulation of EEG signals of olfactory system using Matlab'** , at International Conference on Bio technology and Food processing (ICBF-2009) , held during 8th-10th October , at Department of Instrumentation, at Annamalai University Chidambaram, Tamil Nadu.
- **'Wireless transmission of EEG signals'** , at Fifth Innovative Conference on Embedded systems and Mobile Computing , held during 26th-28th July 2010, at PESIT, Kuppam, Andra Pradesh.
- **'De-noising of Bio Medical signals'**, at International Conference on Dynamics and Control, held at MIT, Manipal. ICDC 2010 (19th -21st Aug 2010), Karnataka.

PUBLICATIONS

- Kalpana.R - **'The implication of graph theory approach with different cognitive conditions of electroencephalography signal'** , International Journal of Applied Engineering Research, November 2015.

- Kalpana.R – **'A case study analysis of EEG signals under conditions of cognition'** , (AJMS)- Asian Journal of Medical Science, July 2015.

- Kalpana.R. – **'Pattern classification of EEG signals on different states of cognition using linear and non-linear classifiers'**, Research Journal of Applied Science Engineering and Technology (RJASET), July 2015.

- Kalpana.R and Chitra.M –**'Non-linear feature analysis on EEG signals under cognition'**, International Journal of Advanced Information Science and Technology (IJAIST) Vol.30, No.30, October 2014, pp141 -146 ISSN: 2319:2682

- R Kalpana, M Chitra, Navkiran Kalsi, Rajanikanth Panda - **'Analysis of brain cognitive state for arithmetic task and motor task using EEG signal'**, in Signal & Image Processing: An International Journal (SIPIJ) Vol 4, No 4, pp 51-59, August 2013 DOI: 10.5121/sipij.2013.4404

- Kalpana.R and Chitra.M. – **'Classification of different brain states from EEG signal using statistical parameters'**, IRACST - International Journal of Advanced Computing, Engineering and Application (IJACEA), Vol. 1, No.3, December 2012. ISSN: 2319-281X

- **'Simulation of EEG patterns with dynamic modelling of the olfactory system'** , published in the International Journal of Chemical Science:8 (5), 2010, S368-S375.

DR. JOSHI MANISHA

ASSISTANT PROFESSOR

PATENTS FILED

- **'Method for detection of Retinopathy of Prematurity (ROP) and tool therefrom'**. Application number -2857/che/2012. Date of filing - 14/7/2012. Status – published.
- **'Method for detection of Retinopathy of Prematurity (ROP) and tool therefrom'**. Application number -2858/che/2012. Date of filing - 14/7/2012. Status – yet to publish.
- **'Method for detection of Retinopathy of Prematurity (ROP) and tool therefrom'**. Application number -3298/che/2014. Date of filing - 3/7/2014. Status - yet to publish.

CONFERENCE PAPERS

- Sudha Guru, Dr. V Umadevi, Dr. Joshi Manisha Shivaram –**'Thermal image acquisition and segmentation of human foot'**, IEEE Indexed International Conference on Signal Processing & Integrated Networks (SPIN), 2017, 2nd and 3rd February, 2017
- Kushal G, Guruprasad Joshi Manisha – **'Experimental work in the design and development of a system for stereotactic radiotherapy treatment planning of eye cancers'**, International Conference on Paradigms in Engineering & Technology, 2nd and 3rd March, 2016
- Pavana M.G, Shashikala N , Joshi Manisha –**'Design, development and comparative performance analysis of bessel and butterworth filter for Nadi Pariksha Yantra'**, in the IEEE Indexed International Conference Engineering and Technology (ICETECH), 17th & 18th March, 2016, Coimbatore.

JOURNALS

- Dr. Joshi Manisha, Aishwarya J - **'Infrared thermography on osteoarthritis - A review'**, International Journal of Emerging Technology and Advanced Engineering, Volume 6, Issue 5, May 2016.
- Dr. Joshi Manisha, Pavana, Shashikala, Dr. B.S Sridhar - **'Optimization of pre-processing module for Nadi Pariksha Yantra'**, International Journal of Innovative Research in Science, Engineering and Technology, Vol. 5, Issue 8, August 2016.
- Dr. Joshi Manisha, Aishwarya Jairam, Dr. V Umadevi – **'Surface temperature distribution in popliteal region for early detection of osteoarthritis'**, International Journal of Engineering Science and Computing , Volume 6 Issue No. 8, August 2016.
- Dr. Joshi Manisha, Hemanth Kumar.G , Harsha L Singh, Preethish Kashyap.H –**'Realization of real time robotic arm control'**, Int. J. Advanced Networking and Applications,Volume No: 8, Issue No: 4 (Jan-Feb 2017), Special Issue-NCBSI-2016

NIRANJAN K R

ASSISTANT PROFESSOR

APERS PUBLISHED

- Title- '**Detection and analysis of tremor by inertial sensing method'**
  Journal – Bonfring International Journal of Power Systems and Integrated Circuits
  DOI – 10.9756/BIJPSIC.8067
- Title- '**Electroencephalogram signal acquisition, analysis and alert system for epilepsy'**
  Journal – International Journal for Scientific Research and Development (IJSRD)
  DOI – Volume 3 issue 12, February 2016
- Title – **'IP based patient monitoring smart system in hospitals'**
  Journal – International Journal for Scientific Research and Development (IJSRD)
  DOI –Volume 4 issue 7, February 2017

ABHISHEK A M

ASSISTANT PROFESSOR

Chair, IEEE YP Bangalore Section

- **Winner** of Massachusetts Institute of Technology (MIT) Global Entrepreneurship Bootcamp , held from 26th to 31st March, 2017.
- **Winner** of Elderly Care Hackathon, organized by the Municipality of the Hague, the Netherlands held from 2nd to 7th October, 2016.
- **Winner** of MED4DEV India-Israel affordable healthcare hackathon, held from 22nd to 24th July, 2016, with Cash prize of 1500 USD.
- **Best Nodal Coordinator Award** at National Nodal Center Conference of Virtual labs, organized by Virtual Amrita Laboratories Universalizing Education, on 6th May, 2016, at Amrita Vishwa Vidyapeetham University.
- **Gandhian Young Technological Innovation Awards (GYTI) 2016** for the Innovative Idea - 'Device for intrapartum materno-fetal care', 13th March 2016, at Rastrapathi Bhavan (President House), New Delhi (Grant Amount: Rs. 15,00,000/-)
- **Featured Innovator**, by CAMTech (Consortium for Affordable Medical Technology), Massachusetts General Hospital, Boston and it is published in CAMTech Pulse Magazine for February 2016.
- **Second Runner-up Prize** at the CAMTech Diabetes Innovation Hack-a-thon, held at the Indian School of Business, Hyderabad on 10th & 11th October, 2015.
- **Best Nodal Coordinator Award** at 2nd National Nodal Center Conference of Virtual labs, organized by Virtual Amrita Laboratories Universalizing Education, on 9th September, 2015, at Amrita Vishwa Vidyapeetham University.
- **New Initiative Program Award** at IEEE Region 10 Student, Young Professional, Women in Engineering Congress 2015, held from 9th to 12th July, 2015, at Colombo, Sri Lanka.
- **Winner** of CAMTech GE Challenge Jugaad-a-Thon, held on 28th and 29th June, 2015, organized by CAMTech India.
- **Winner** of CAMTech India Jugaad-a-thon, held during 19th & 20th July 2014, organized by CAMTech India.
- **Best Paper Award** - Appaji Abhishek, Suma Ningappa- **'Comparison of electrocardiography (ECG) as biometrics authentication with well proven fingerprint and iris technologies'**, IEEE EMBS International Student Conference(ISC2014), Malaysia, 5th June, 2014.

ASHMITA DEB

CGPA- 8.95

3rd SEM

"Being the topper is motivating and helps me push through to do well in future exams. The department is very nice. The faculty is very understanding and helpful and that makes students come out of their shell and perform better."

SANJANA V

CGPA- 9.22

5th SEM

"I feel honored and grateful to be the topper of the department. All my hard work and efforts have paid off. Right from the beginning of the semester, I managed to maintain a good score in internals. I chose to do alternate assessments which were relevant to the topics, which helped me score better. I used to follow up with what was being done in the class. Also, I used to study the subjects and understand it clearly. With previous year question papers as reference, I was able to gain confidence and this helped me score better. Being able to apply the concepts learnt, helped me achieve success."

VINUTHA GH

CGPA- 9.6

7th SEM

I believe
"The starting point of all achievement is desire" -Napoleon Hill

"I have been the topper of Medical Electronics for 4 consecutive years. A constant desire to learn from each day, each person and the urge to be a better version of myself has made this possible. Along with the immense joy, being a topper also brings in a lot of responsibility and expectations to be met. All of it has been possible only by the support of my professors in ML department and my fellow classmates."

HARSHITHA M

CGPA- 8.6

2nd SEM PG

"I'm honored to be a part of Medical Electronics Department .I learnt a lot from this course. The faculty is very encouraging. I believe in giving my best in whatever I do. That is what I have been following, and will continue to follow , for my further semesters."

INDIAN RAGA FELLOWSHIP

The IndianRaga Fellowship is the world's most prestigious network of performing artists, producing some of the best collaborations and music videos. Past Fellows have performed at Lincoln Center, Chicago Cultural Center, Joe's Pub, and have been featured on NPR. The videos have collectively garnered over 10 million views.

IndianRaga officially announced the 2017-18 Edition Fellowship in India, for the first time. After three rounds of auditions and submissions, I was selected as an IndianRaga Fellow, under the category of dance- Kuchipudi. This time, the fellowship was held in Mumbai. I met many creative and talented musicians and dancers there and collaborated with them during the fellowship week. I took part in 7 dance productions,all of which were fun and exciting.

The productions were very creative, which blended new age trends with classical Indian art.

The knowledge we gained and the fun we had while we worked in the studio, from morning to night for the span of a week, is unforgettable. The video productions were shot very professionally and some of them have already been released.

MAKE IN INDIA ENTREPRENEURSHIP BOOTCAMP

The event was sponsored by IEEE Young Professionals - Bangalore Section, IEEE Region 10 Strategic Planning under Entrepreneurship Activities Support Funding and Aarogya Seva.

The participants of IEEE MIIEB were selected from a pool of applicants after vigorous rounds of selection and interview process. They were provided with a protocol given by the Massachusetts Institute of Technology (MIT) framework of Disciplined Entrepreneurship that combined rigorous academic study with the excitement of discovery, support and intellectual stimulation in an intense, immersive experience.

During the boot camp, the participants were pushed to their limits, inspired and challenged by the faculty, speakers, MIT GEB Alumni and mentors from all over world. The participants were trained in analyzing 24 step frame work of Disciplined Entrepreneurship, discovered by Prof. Bill Aulet of Massachusetts Institute of Technology. Apart from the MIT GEB alumni and Prof. Abhishek M Appaji. There were lectures from around 30 speakers, spanning over the 11 days of bootcamp. The speakers were experts on startup creation, startup mentoring, financials, intellectual property, taxation, social innovation, open innovation, success in entrepreneurship, product strategy and positioning, startup culture in USA, France, Germany and UK. There were many speakers from different fields of expertise who offered their guidance on building a startup.

The speakers, faculty and mentors were from various organizations including Indian Institute of Science, InnAccel, Government Agencies, Google, IBM, Startups, K&S Partners, IbHubs, etc. The participants were made to work on the deliverables on the concepts taught in the sessions and had to submit them at the end of the day. On the final day, they had to pitch their innovative ideas to the jury consisting of mentors, investors, VCs, Angels, Rotary club, OCEO labs, etc.

As a volunteer, I was given work to help organise the event. As a participant, I learnt about entrepreneurship, tools and tactics required to capitalize my idea to a successful startup. On first day, we were briefed on challenging real life problems that we had to work on and come up with innovative solutions. Our team members were Kishore Sharma, Ramya H R, Rahul M, Sri Karthick and myself, Dheeraj B N.

Two teams were announced as winners and were awarded ₹10K and ₹5K for first and second prize respectively. We won the first place for the proposed idea. The camp motivated the participants to start a venture or to nurture their startup into seeking the path to success.

-Dheeraj B N

MISS INDIA 2018 JOURNEY

"A journey of a thousand miles begins with a single step." – Lao Tzu

Just like that, my journey towards Miss India Karnataka 2018 began on the 18th of Feb 2018 at Phoenix Marketcity, Bengaluru. That day was my "first step" in this incredible journey. It started off with about 300+ participants,all of whom were excited for the audition. Among all the participants,only about 200 of them were able to meet the height criteria- which requires the participant to be a minimum height of 5'5'' or above. Next, all the participants were to take part in the ramp walk. Walking across the ramp before the judges,who are experts in their fields,was a bit intimidating,but we all put our "best heel forward" and strutted across the ramp. The first round was crucial to the competition,as the top 15 were chosen, among the 200 ,which was further filtered to the top 10.Then,we had the introduction and Q&A round,which being the final one,was the deciding round for the top 3 representing the state. Being one amongst the top 3 felt was like a dream come true. And,just when I thought I had a breather, we(the 3 finalists) had to start preparing for the Miss India Karnataka 2018 title.

Miss India Karnataka 2018 Auditions (18th february,2018)

The crown bearer for the title, among the 3, was to be decided during the South Zonals,which was held over a period of 4 days, from 21st-24th February, at the Ottera, Bengaluru. 15 contestants (the top 3 from all the 5 states of South India) were competing for their respective state titles. The training consisted of photoshoot sessions, ramp walk ,choreography , personal interviews,etc., at the end of which, was the crowning ceremony.

The judges were Pankaj Advani, Raai Lakshmi, Behram Singaporia, Vijay Suriya and the South Zone mentor for Miss India '18, Rakul Preet Singh.

This day holds a special place in my heart. I remember it so vividly, like it was just yesterday. I am still in awe that almost a month has gone by since the crown of Miss India Karnataka 2018 was placed on my head. It all seems so surreal ,like a beautiful dream that stays in your memory even after you wake up,making the day happy and pleasant. I still remember the moment when they announced my name- I almost blacked out from joy! I wanted to jump with glee and prance, but my body was too numb to do anything but obey to bowing down under the crown. There is one thing I can definitely tell you from my experience,deep down every girl longs to be treated like a princess. And, nothing beats the satisfaction of gaining the crown earned from weeks of endless effort and exhaustion.

My journey so far has been empowering. The pageant has instilled so many virtues in me- discipline,dedication,the determination to learn and do things the right way,to never give up-to name a few, that I will take away with happiness and gratitude. I've learnt to be a respectable, confident woman, who empowers women and girls to follow their dream,to be the voice, that makes a difference.
I've learnt and experienced the culture of the other participants from various states of India and have grown immensely due to the knowledge acquired.
I've learnt that every girl is beautiful in her own way and should be respected.

I also feel blessed and fortunate to have gone through such an amazing experience and to have been trained by the experts in this line of work.
I feel proud and extremely humble to have made it this far and I'm looking forward to my journey ahead.

SANCTUARY WILDLIFE AWARD

"Photo of shark ray fish in Mangaluru wins Sanctuary Asia Award".

A moment captured in Mangaluru port, by an amateur photographer, **Vishruth Cavale** has fetched him the "Young Photographer of the Year Award", instituted by Wildlife Magazine Sanctuary, Asia.

Vishruth shot the picture of a Shark Ray caught by the fishermen, lying in a plastic crate, at Mangaluru Port. The picture titled- 'Last Port of Call', captured in October 2016, has won the First Prize in Young category of Conservation Photography.
Shark ray (Bowmouth guitarfish), also referred to as mud skate, is a member of Rhinidae family and is one among the many vulnerable shallow water fish species. The fish is considered to be a prized catch for fishermen.

Wildlife and Photography

Another photo by him, entitled ‘ Smoke on Water’, featuring a cattle egret at a lake in Lalbagh, Bengaluru, fetched him the first prize in the Young Category of ‘Art in Nature’ theme, in the same competition.

Awards were presented to the winners at The Sanctuary Wildlife Photography Festival 2017, organised at Royal Opera House in Mumbai recently.

This article was featured in the DECCAN HERALD, November 14 2017

CIME

Centre for Innovation in Medical Electronics (CIME) is an entity focusing on affordable healthcare and deskilling in Medical Device Development. It was inaugurated in February 2015. This houses Incubation Centre, Patent Office, Grant office, etc., and contains a collaboration with industries, institutions, and hospitals in India and around the world. It drives students and faculties towards entrepreneurship.

It currently has few incubates working on Digital X-Ray, Vertigo Balance Disorder (Cyclops) and projects like Smart Eye Kiosk for Community Screening, Intrapartum Maternal Fetal Healthcare Device, etc. It helps in identifying, building and nurturing the projects into ventures and aids in building partnerships with different institutions, industries, hospitals and funding institutes. CIME Incubates has grants from DST, DBT and other government agencies of India and abroad.

CIME has a pool of mentors, Dr Purna Prasad, Dr Shyam Vasudeva Rao,
Dr Gundu Rao, Dr Lazer Mathew, Dr K N Bhanu Prakash, and few others as experts.

1. SMART EYE KIOSK:

Currently, eye screening for capturing retinal and corneal images is done manually using devices that need an operator (physician) during the entire process of screening and testing. This can sometimes be tedious and cumbersome. So, it will be very useful if a device is developed, that automatically screens the eye, captures images and readings and requires doctor's assistance only for final diagnosis. This is exactly what one of the teams in CIME is working on.
Smart Eye Kiosk is an automatic eye screening device that solves this problem. Here is an interview that gives deeper insight to this project and the team working on it.

TEAM MEMBERS:

Dr Bharat Kumar Hegde
Vijayashri B Nagavi
Rashmi Jigajinni
Umashankar K R

DURATION OF THE PROJECT: 2 YEARS

Q. What was the inspiration for this project?
.A. There is no equipment in the world for a comprehensive automated eye screening, which can capture both retinal & corneal images, as well as, provide refractive errors. Existing devices are all manually operated, which requires a skilled operator. So, we took up this project to automate the process and reduce errors.

Q. What kind of project is this?
A. This is a collaborative project between Tan Tock Seng Hospital (TTSH), Nanyang Technological University and BMS College of Engineering. We were responsible for the complete prototype development, which mainly involved substantial efforts in image processing and automation. The project till proof of concept stage was incubated in Centre for Innovation in Medical Electronics (CIME). The device has been shipped to TTSH-Singapore, for clinical validation. The project was carried out under the able mentorship of Dr Shyam Vasudeva Rao.

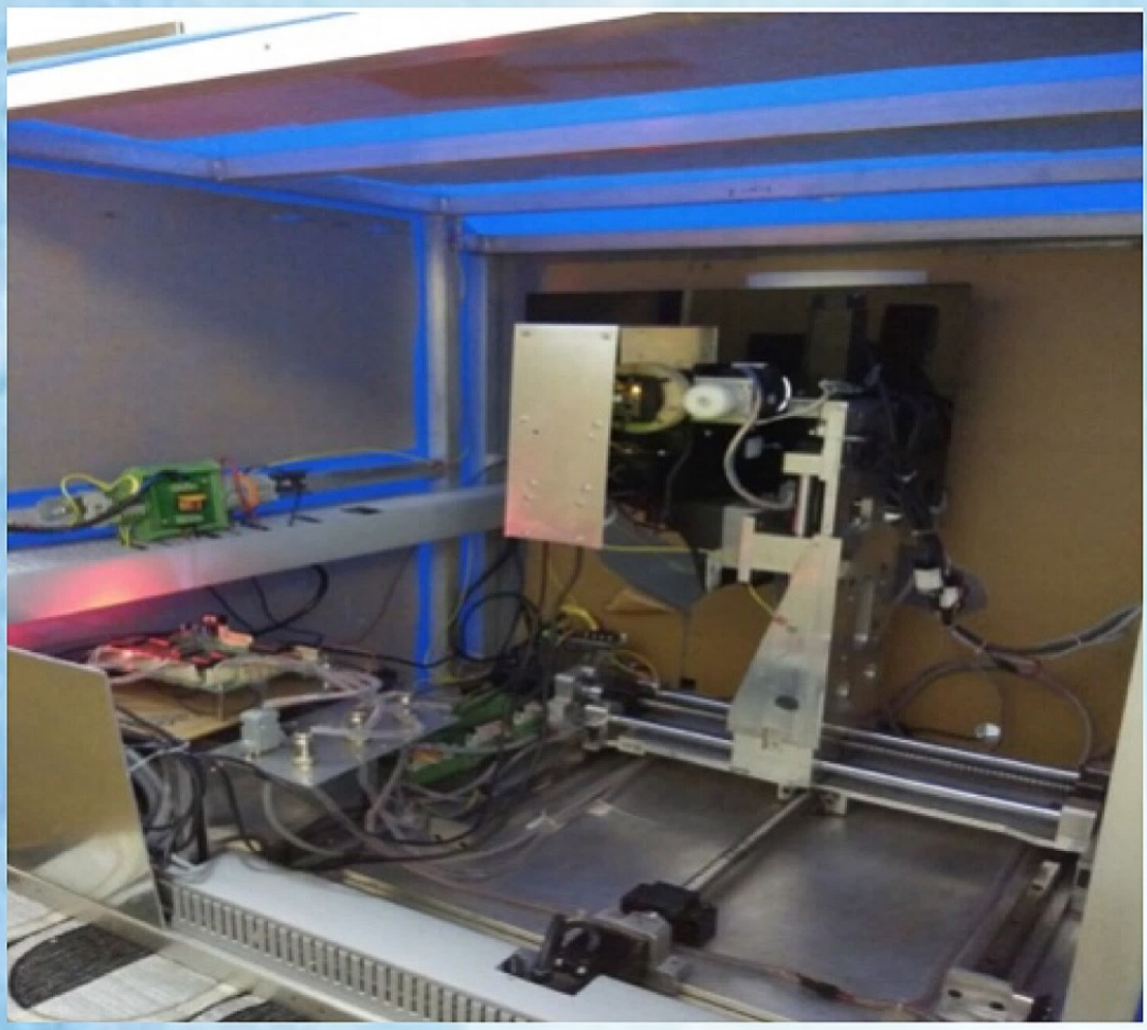
Q. What is the electronics used in this device?
A. The master controller of this device is hosted on a laptop which also acts as a Human Machine Interface (HMI). Based on the real time image feedback, the servo motors were controlled using Arduino Mega 2560 controller. The mode of communication between the camera, laptop and microcontroller was through serial port. An optical encoder was used as a position feedback of the motor. The extreme ends of each of the axes were detected using limit switches. The interface between motor drives, limit switches and microcontroller was implemented on a two layer PCB.

Q. What are the advantages of this device?
A. This is the first ever comprehensive automated eye screening device. Being a non-mydriatic, all-in-one device (without external pupil dilation), it brings down the overall duration of the eye screening from more than an hour, to a mere 5 minutes. The screening is assisted with real-time audio commands at every step. The accuracy of the refractive error measurement is comparable to the existing auto-refractometers. The advanced tele-ophthalmology enables the clinician to be able diagnose the patients remotely, for all possible anomalies like glaucoma, cataract, diabetic retinopathy and age-related macular degeneration. While being fully automatic, it can also be controlled manually by an operator, if the patient is not comfortable using HMI. The device can also be used for patients with squint eyes.

1.SMART EYE KIOSK

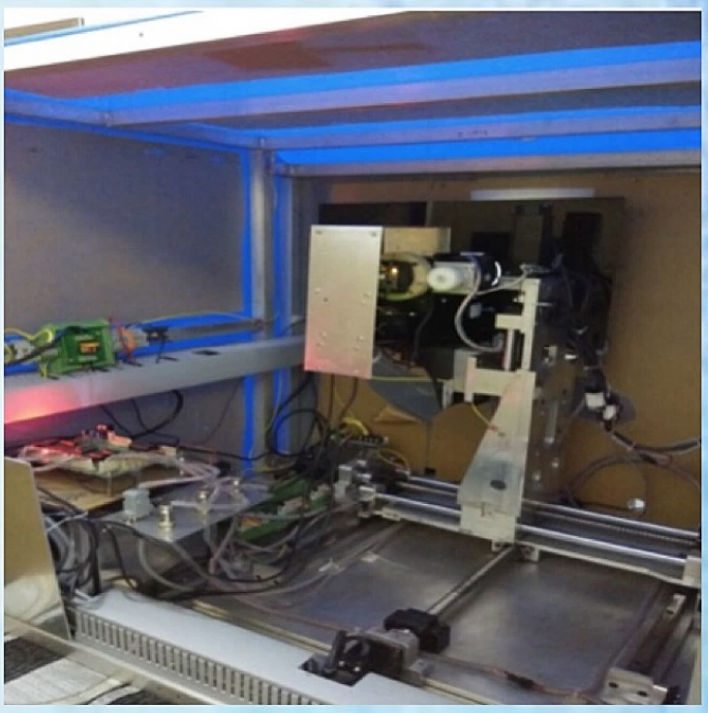
Q. What is the working principle of the device?

A. The device operates on the concept of image guided automation. The device calculates Inter-pupillary distance and refractive error. It also captures posterior and anterior images of the eye without dilating the pupil externally (non-mydriatic). The posterior and anterior images of the eye is captured using Autofocus and Auto Capture Technique. The device generates a pdf report including all the images and readings. The screening data is automatically uploaded to a dedicated web portal. Registered doctors can login to this web portal remotely and can access the data generated by the device with a provision to view individual images. The report along with the doctor's diagnosis will be mailed automatically to the email address provided by the patient.



Q. What are the disadvantages of this device?

A. One of the major disadvantages is the limit of minimum pupil diameter. The device will not be able to take a good fundus image for the patients with pupil diameter less than 3mm. Being a fully automatic device, it demands a greater extent of cooperation from the patients during the entire duration of screening. With existing sequence of automation, it sometimes is difficult to get a fundus image for patients with dry eye or with intra-ocular lenses.



Q. Are you working on any other device to overcome the shortcomings of the present one?

A. We are working on the automation sequence to be able to do the fundus imaging irrespective of corneal conditions. Innovative optical design methods are being tried out to bring down the limit of minimum pupil diameter required for posterior imaging. We are also working towards making the next device better in terms of cost, compactness, usability and appearance.

SAMPLE REPORT GENERATED BY THE DEVICE

Smart Eye Kiosk

REPORT

BMSCE, Bengaluru

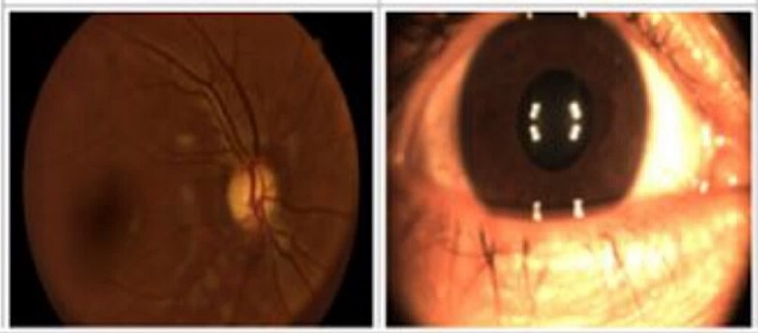
VISITOR DETAILS			
DATE :	08-12-2017	GENDER :	M
FIRST NAME :	B	AGE :	30
LAST NAME :	H	EMAIL ID :	bharathkumar.hegde@gmail.com
VISITOR ID :	20171208-115206	PHONE NUMBER :	1

OCULAR FINDINGS

INTER PUPILLARY DISTANCE (IPD) :	51.7 mm

OD (RIGHT EYE)

Posterior Segment | Anterior Segment

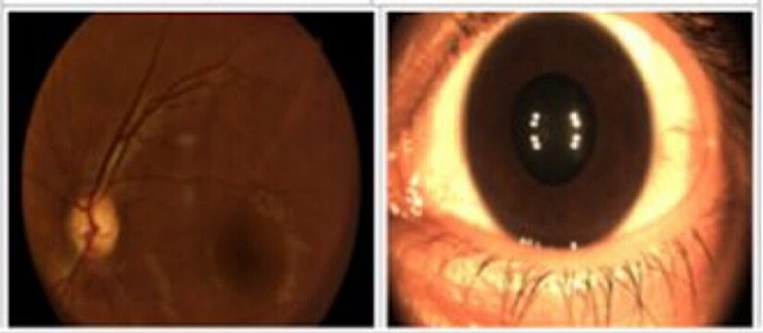


AUTO - REFRACTION

	SPHERICAL (D)	CYLINDRICAL (D)	AXIS (deg)
DISTANCE VISION	0.5	-2.75	12

OS (LEFT EYE)

Posterior Segment | Anterior Segment



AUTO - REFRACTION

	SPHERICAL (D)	CYLINDRICAL (D)	AXIS (deg)
DISTANCE VISION	0.5	-1	17

Screening duration = 3 minutes 19 seconds

Send your feedback to: smart.eye.kiosk@gmail.com

2. SASCAN

The mortality rate due to oral cancer is very high in India. This is mainly because the disease is getting detected mostly during the late stage of its development. So, there is a need for development of a screening device that could detect cancer early, which would lead to improved patient care with minimal cost, trauma or functional deficits. The SASCAN MEDITECH Pvt Ltd team has put their foot forward in this direction and are developing a device that solves this problem. Let us get to know more about their venture in this field.

SASCAN DEVICE

TEAM MEMBERS:

Core team:

Dr. Subhash Narayanan, MSc, Ph. D. (Founder CTO & Acting CEO)

Dr. Ruhi Agarwala, MBBS, MSc (Global health) (Co-Founder & Public Health Expert)

Sandeep P.M., B. E. (Senior Software Engineer)

Priyanka Deshmukh, M Tech (Med. Elect) - Junior Hardware Engineer

Vinay Palaksha, B.E. (Junior Software Engineer – Testing & Quality Control)

Advisors:

Dr. Shyam Vasudev Rao, MTech, PhD. (Mentor)

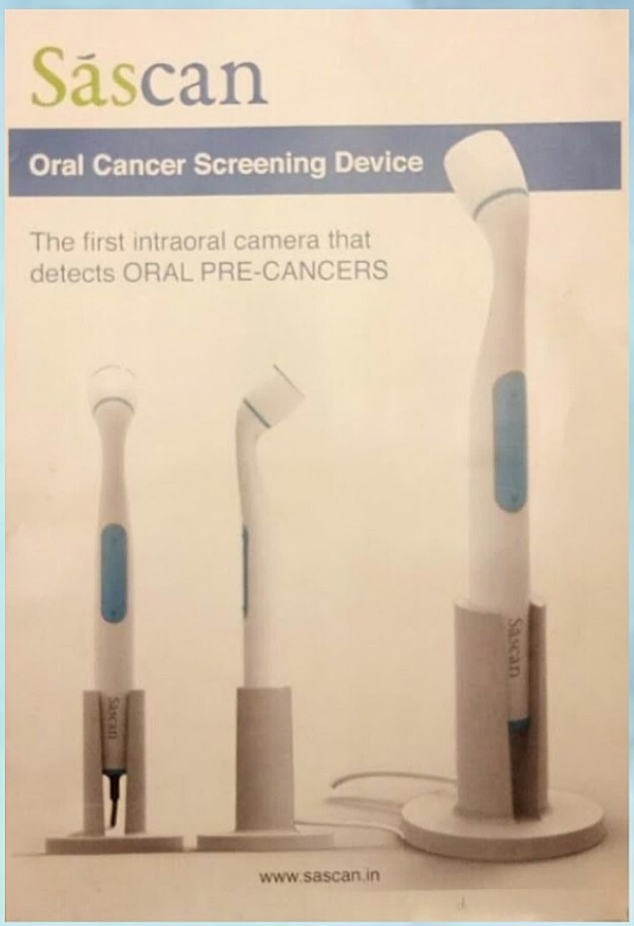
Dr. K. S. Gopinath, MS, FRCS, FAMS (Collaborating Surgical Oncologist)

Dr. Vishal Rao, MBBS, M S (Surgery) (Collaborating Head & Neck Oncologist)

Dr Suchetha Jyotish, MD (OBG), DGO, (Collaborating Gynaecologist)

DURATION OF PROJECT : 2 YEARS

Q. What is the aim of this project?
A. The aim of this project is to develop a hand-held and portable screening device, based on a disruptive multimodal/multispectral imaging technology, combining tissue fluorescence, diffuse reflectance and oxyhaemoglobin absorption for oral cancer detection.



Q. Who is funding this project?
A. This project is funded under the BIG scheme of the Government of India (BIRAC) and Elevate 100 of the Government of Karnataka. The company has won the iPitch 2018, contest conducted by Villgro Innovations and their support would help the company in creating an impact through mass screening of population in the rural areas, where the incidence rates of oral cancer are high.

Q. What are the novelty points of your device?
A. 1. World's first integration of a camera in a multimodal oral cancer imaging device
2. Affordable and easy to use
3. Functions as a biopsy guidance tool
4. Grades cancer with the help of a machine learning algorithm
5.Adaptable for screening of other organs like cervix, GI tract and colon

Q. What is the principle used for this device?
A. The oxygen we inhale is transported to different parts of the body by haemoglobin, in the form of Oxygenated Haemoglobin(HbO_2).The absorption due to HbO_2 is lower in cancer cells as compared to healthy cells of the body.In this device we monitor the changes in the HbO_2 saturation using multispectral optical imaging techniques and arrive at signs that help in early detection of cancer.

The main principle is that during tissue transformation towards malignancy, many biochemical and morphological changes are observed in the tissue. The biochemical changes are identified using tissue fluorescence. Morphological changes occur due to enlargement of nucleus, which leads to increased scattering of the light and a lowering of the intensity of the diffusely reflected light emanating from the tissue after multiple elastic scattering.

AWARD WON BY THE TEAM

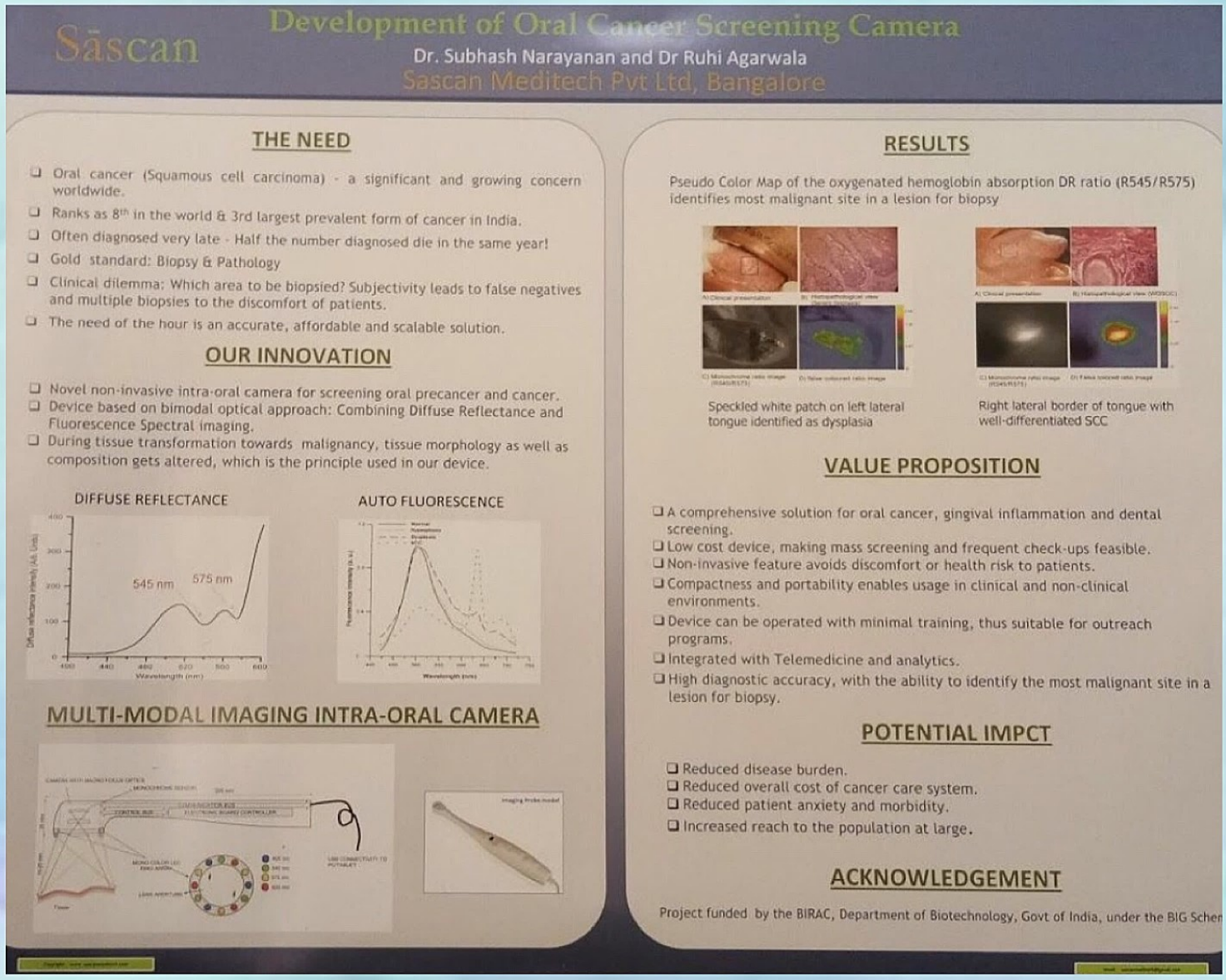
Q. Explain the working of the device?
A. The device has multiple LEDs that emit different wavelengths matching with the tissue absorbers and a monochrome camera to capture the diffusely reflected light and tissue fluorescence synchronously on illumination with different LEDs. The captured images are processed and the pseudo colour maps of diffuse reflectance image ratios and fluorescence are used to detect the presence of cancer inside the oral cavity. The quantitative values of image ratios are compared/ correlated with pathological findings to develop an algorithm that helps to detect the grade of cancer at the point of care, in real time.

Q. At what stage can this device detect cancer?
A. The device can detect cancer cells in the pre-cancer stage, which makes it one of a kind in India.

Q. What is the electronics used in this device?
A. DeMUX, MOSFET driven driver circuits, LEDs and CMoS sensor are the main electronic components used in this device.

Q. What is the current status of your project?
A. The device is currently undergoing clinical validation through a multicentric trial covering hospitals like Health Care Global (HCG), and Dayanand Sagar Dental College, in Bangalore and Government Dental College in Kottayam, Kerala.

Q. Are there any improvisations that you would like to make in the device?
A. Yes. We are working towards making this smartphone compatible.



3.A. INTRAPARTUM MATERNOFETAL CARE

The devices currently used in India, for intrapartum maternofoetal heart rate monitoring purpose are expensive and thus cannot be afforded by Primary Healthcare Centres. Such facility is therefore not available in rural areas. It is high time that a low cost, reliable, and portable device be developed to solve this problem. A team at CIME is exploring this area of healthcare and trying to solve this issue by developing a low cost, reliable and portable device. In the following 2 interviews we have explored the research undertaken in this regard.

TEAM MEMBERS:

Ms.Vichal
Mr.Brijesh

DURATION OF PROJECT : 2 YEARS

Q. What is the procedure you followed during the development of this device?
A. We conducted extensive clinical research through clinical immersion for 7 weeks in Kempegowda Institute of Medical Sciences (KIMS) and MS Ramaiah Hospital.

Q. Who is funding this project?
A. This project is funded by SRISTI-BIRAC (Biotechnology Industry Research Assistance Council).

Q. Explain the principle and working of this device?
A. This device works on the 'Adaptive Noise Cancellation' principle. The electrodes are placed on the chest to record the maternal ECG and another pair of electrodes are placed on the abdomen to record foetal ECG. The chest electrode signals include maternal ECG and some noise and the abdomen electrode signals include foetal ECG, maternal ECG and noise. Noise cancellation technique is used to obtain only the foetal ECG.

Q. What is the hardware and software used in this project?
A. MATLAB is used as platform for code development.
STM 32 development board was used for individual component analysis, initial testing and data acquisition. In the final prototype ARM7 processor is being used.
Ag-AgCl surfaces electrodes are used for data acquisition.

Q. What are the advantages of this device?
A. This device is portable, reliable and has low cost, which is very feasible for usage in rural areas. It records the uterine contractions every half hour. It records and displays both maternal and foetal ECG.

3.B. RAPID AND ACCURATE BILIRUBIN MEASUREMENT DEVICE FOR DIAGNOSIS OF NEONATAL HYPERBILIRUBIN

Q. What was the inspiration for this project?
A. Neonatal Jaundice is very common. About 60 to 80 percent of infants are affected. Most of the cases are physiological, while few of them are pathological. The current techniques have quite a few drawbacks. So we planned to develop a device that uses only few drops of blood to give instant results, which is at par with the laboratory report values.

Q. What is the aim of this project?
A. The aim of this project is to develop a minimally invasive device for quick and accurate measurement of the bilirubin levels in infants for instant detection of jaundice.

Q. What are the existing techniques and what are their drawbacks?
A. There are currently 2 techniques used- Laboratory technique and Transcutaneous technique.
In the laboratory technique, blood is drawn to measure the serum bilirubin level in it. The main drawback of this technique is the difficulty in finding a feasible vein in infants, as the veins are very sensitive in them. Also, the volume of blood required is significantly more.
In the transcutaneous technique, the yellowness of the skin is measured to determine the presence of jaundice. The treatment for jaundice is phototherapy (in which UV rays is used). But once this is done, the correlation between the blood and the skin is lost. So, carrying out transcutaneous method after this therapy gives the bilirubin level in the skin, but the value of interest is the level of bilirubin in the blood.

Q. Who is funding this project?
A. This project is funded by BIRAC (Biotechnology Industry Research Assistance Council), under the BIG (Biotechnology Ignition Grant) scheme.

Q. What are the novelty points of your device?
A. The current techniques work mainly on the plasma of the blood (they do not use the whole blood because RBC's scatter light). So, we plan to use a Reagent-less path/technique, where complete blood is analysed. Also, the target is to build a device that uses only 1-2 drops of blood.

4.DIGITAL X-RAY SYSTEM

There is a greater need for an affordable and compact medical imaging device in India, especially in rural areas, which have low resources. It is necessary that a device be developed, that can be used in Primary Health Centers (PHCs) unlike the ones currently available in the market which demand higher resources in terms of cost, energy, skilled manpower and radiation levels. This is what the team at CIME was inspired by and chose to explore.

TEAM MEMBERS:

Dr. Suma H N (Principal Investigator)

Appaji M Abhishek (Co-Investigator)

Dr Bharatkumar Hegde (Research Associate)

Priyanka Chakravarty (Junior Research Fellow)

DURATION OF PROJECT : 2 AND A HALF YEARS

4.DIGITAL X-RAY SYSTEM

Q. What is the device which you are currently working on?
A. We are working on a low cost Digital X-Ray system, which can be made easily accessible to people in the rural areas.

Q. For how long have you been working on this?
A. We have been working on this project for the past two and a half years.

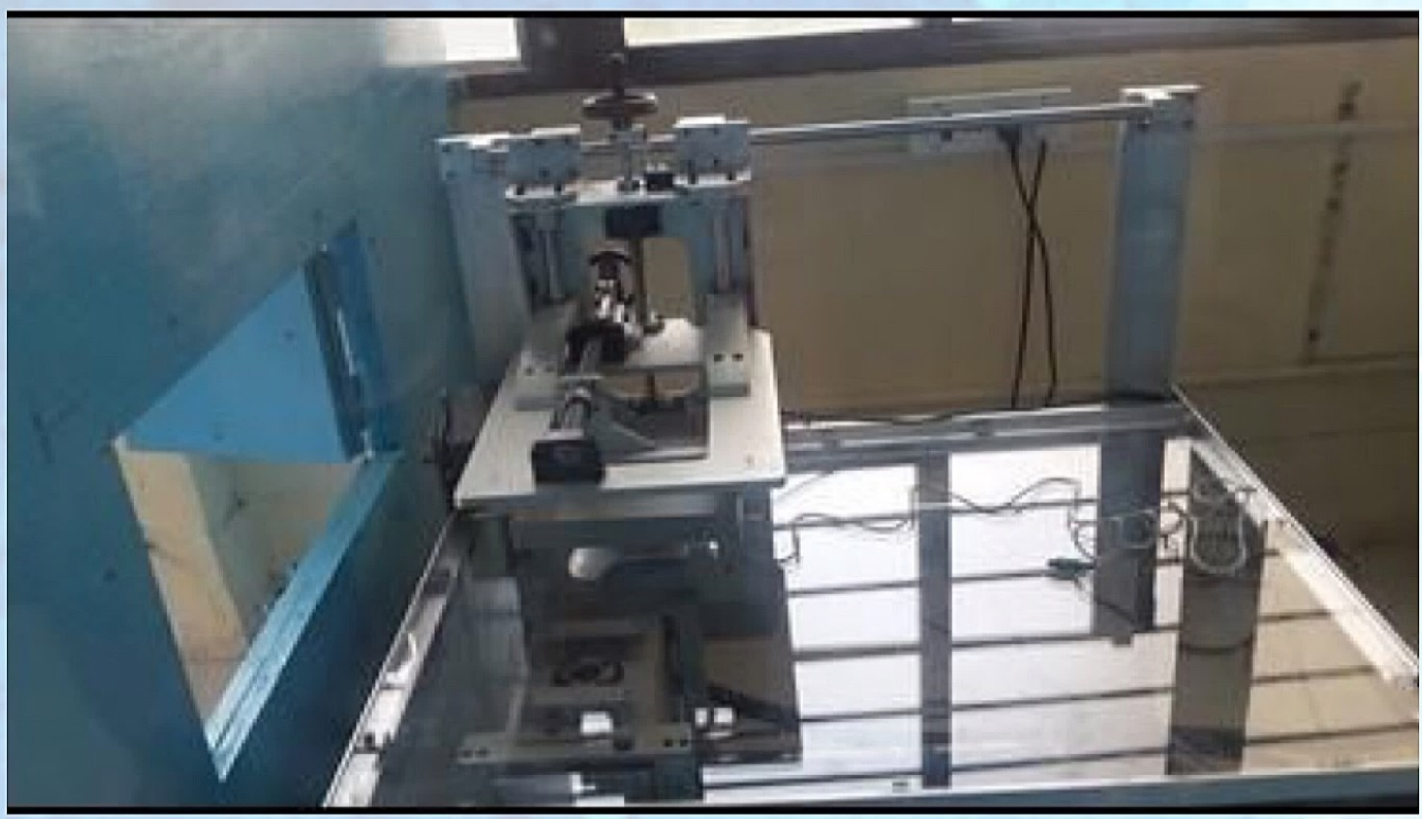
Q. How is your project funded?
A. It is funded by Department of Science and Technology (DST), Government of India.

Q. What are the advantages of your device?
A. The conventional digital X-ray machines, use a flat panel detector/sensor, which is the most expensive component of the device. We made our device more affordable by using a line (single pixel array) detector, which is far more economical. The device automation is designed in such a way that we are able to get a 2D (area) image from a 1D (line) detector.Any medical diagnostic X-ray device has to adhere to the AERB radiation guidelines, if it crosses certain dosage levels. To address this issue and make it more accessible, we have designed a very low dosage X-Ray imaging approach in our device. Being digital in nature, it also enables better user experience and documentation. The implemented automation of this device reduces the human intervention to a greater extension thereby avoiding X-ray radiation exposure faced by the operators.

The device is enabled with dose optimization, i.e. one can restrict the area of exposure to the region of interest accurately, thus avoiding exposing unintended area.

Q. What is the basic electronics used in your device which makes it different?
A. Instead of an area detector, we have used a line detector. This basically works as a scanner, in which both the source and detector move simultaneously. The source radiation is collimated to match the width of the detector and the output is captured line-by-line, hence employing less source dosage which, is deliverable to the patient. The PC acts as a master controller, which controls the X-Ray source, detector and motors in synchronisation, to produce a good X-ray image.

Q. Is there any scope for improvement in your device?
A. In future, we plan to make it portable by using miniature X-ray sources for easy use of access and also for regulatory approval purposes. We are also working on the concept of tele-radiology, to enable the clinician to diagnose remotely.



We don't remember days,
We remember moments
-Cesare Pavese

PHASESHIFT–2017

ALPHA DESIGN TECHNOLOGIES

PRESENTS

PHASE SHIFT

SEPTEMBER 15th and 16th 2017

PhaseShift- 2017

MED BUZZ

PhaseShift is the annual technical symposium of BMSCE. The motive of this grand symposium is to primarily develop inquisition, a better scientific temper and the desire to consume knowledge as well as solicit both knowledge and the relevant skills from the collaborating industries to produce masterpieces well beyond our time.

The 4th edition of PhaseShift was held on 15th and 16th of September 2017, with collaborative efforts between 15 departments and 5 clubs of the institution

SENSORS IN CONSUMER'S LIFE

The Department of Medical Electronics conducted 3 events and 2 workshops during this tech symposium. The events and workshops were conducted and sponsored by various companies, namely TMI SYSTEMS, ITIE KNOWLEDGE SOLUTIONS, CONSILIENCE CONSULTANTS, PHILIPS and VI SOLUTIONS.

All the events were based on the theme of PhaseShift 2017 - ‘Senses and Sensors’. The theme was used as a platform and the events were derived from it like , marketing, testing the participant’s technical knowledge through quizzes ,MCQs and so on. The Workshop was designed for the participants to gain knowledge about biomedical signal acquisition using biomedical sensors and LabView programming concepts. A hands on workshop was conducted by Philips, which focused on introduction to new technology and progress.

CRIMINICAL CASE 2.0

LAB VIEW AND MYDAQ

A department stall was set up to exhibit the medical devices and projects of the department . Biomedical instruments like heart rate monitor, sphygmomanometer, brain computer interface, defibrillator, pulse oximeter, ECG recorder were exhibited. The posters in the stall showcasing departmental activities and CIME lab educated the visitors about the achievements of the department and its students

The mission of PhaseShift is to provide it's participants with the necessary exposure to help them become technically proficient and instill a sense of motivation in young entrepreneurs.

The Department of Medical Electronics worked in this regard to bring out the camouflaged abilities of the students throughs various seminars, workshops and events. The events and workshops were triumphant with the collaboration and teamwork of the teachers, volunteers, and coordinators.

TRIPLE DECKER

What takes us back to the past are the memories.
What brings us forward is our dreams.
-Jeremy Irons

CLASS PHOTOGRAPHS

2017-2018

1st YEAR

2nd YEAR

3rd YEAR

4th YEAR

M Tech

FACULTY

WORKSHOP ON BIOMEDICAL ETHICS
Batch of 2014-2015

VISIT TO NIMHANS
Batch of 2014-2015

VISIT TO ENABLE INDIA
Batch of 2014-2015

VISIT TO INNACEL
Batch of 2014-2015

NIMHANS VISIT

We, the students of 2nd semester,M.Tech, Biomedical Signal Processing and Instrumentation, were privileged enough to get an opportunity to pay a visit to the NIMHANS research center and the brain museum on the 28th of April 2017, alongside our two esteemed professors, Dr. K.Vijayalakshmi and Dr.Suma M S.

Upon our arrival, Shwetha gave us a brief introduction about the anatomy and physiology of the human brain and a comparison of the human brain with that of other organisms and how it has evolved over the years. She walked us through the various structural and functional attributes of the human brain. Dr. Anita, a professor at NIMHANS walked in during the lecture, with whom we had an interactive session in the end during which she answered the numerous and various doubts that we had regarding the human brain, its functions, its disorders and the various means to detect those disorders and provide means to cure them. The hot topic for the day was “Epilepsy”. We were all very curious about the different measures the people at NIMHANS adopt to detect the stage of epilepsy, the region of origin and the different means available to cure them.

Post the theory session, we had an anatomy class wherein we had a chance to touch, feel and look deep into the most exciting and speculative part of the human body – “The Brain”. We could see for real the various regions of the brain, the development of scaffolds, the presence of the grey and white matter and the various interconnections present in between them. This helped us understand better about the structure of the brain and the reason why an abnormality affects a particular region of the brain. We were lucky enough to even learn the anatomy of the other various organs present in the body like the heart, lungs, kidneys and the liver, by looking at the organs preserved by them.

Once we were adept with the anatomy of the brain, Dr. Anita took us to the brain museum where we could see the preserved brains of various diseased patients. This helped us know how each disease, like that of Alzheimer’s, Schizophrenia, Hypertension or trauma could affect which part of the brain. This was a very informative session as this helped us know why a particular scan is preferred over the others, for a particular type of disease.

Soon, we came towards the end of our visit and Dr. Anita concluded by suggesting each one of us to be a donor and enlightening us about the various organs that we could donate. All in all, we had a very wonderful and an informative time at the NIMHANS Research Center.

- M.Tech (2017-2019)

KERALA DIARIES

Thiruvananthapuram, popularly known as Trivandrum, is a quaint city located on the coastline of Kerala. It is the capital city of the state. We were very excited about the prospect of visiting Trivandrum, for the workshop, 'Avenues of Engineering in Biomedical Research', which was held at Shree Chitra Tirunal Institute of Medical Science and Technology.

A group of 14 of us, from the department of Medical Electronics, with our teachers, Dr. Suma M.S and Mr. Niranjan K.R, set out for the journey in high spirits; and with lots of expectations, we arrived in Trivandrum.

The next two days comprised of the workshop. During the first day, there were a lot of lectures scheduled. They dealt with topics like- 'Medical device development in the Indian healthcare industry', 'Indian medical devices scenario', and, 'How is a medical device unique?'. These lectures were very informative and helped us understand better, about the rules and regulations to be followed while designing a medical device, the problems faced, and also about how the development of a medical device is an interdisciplinary process.

We were also taken to their state-of-the-art labs, where many innovative devices have been designed. We were shown the artificial heart valve, that had been developed and we also had the opportunity to interact with the experts, who were part of the development team. We were also shown a hydrocephalous shunt, and a working model of the heart. Then, we had a session on precision fabrication, followed by a lab visit for the same. At the end of Day 1, we were told about the 'Ideate' group activity, which would be held the second day. The whole audience was divided into number of groups and a list of topics (problems) were given, from which we had to select one and pitch in an innovative idea, as our solution, the following day.

Day 2 began with a talk about designing medical devices, after which we visited a 3D bioprinting laboratory. We also had sessions describing future opportunities and career prospects in this field. Post lunch, the idea pitching session started. We had to present our solutions in front of an esteemed panel of judges. At the end of the session, the results were announced and we were all very pleased to hear that one team from our college had won 1st place. The workshop was concluded with a valedictory speech.

We decided to mix work with pleasure, and make the most out of our time in Thiruvananthapuram. So, the following day, we paid a visit to the famed Ananthapadmanabhaswamy Temple, which was a great spiritual experience. The same noon, we set off for Poovar Island, which is a tourist town located at the southern tip of Thiruvananthapuram. We took the backwater boat ride, along the mangrove shores to visit the estuary, one of the highlights of Poovar, which we enjoyed thoroughly.

On the final day of our stay, we set off to visit Ponmudi Hills, which is surrounded by a thick, dense forest range. The climb up to the peak was an exhilarating experience and the view from the top provided us a scenic view of the mountain range. On the way back, we stopped at Meenmutty Waterfalls, which is nestled in the peaks and the trek to visit the falls was thrilling and exciting. Finally, it was time to pack our bags and set off on our journey home, with a heavy heart and brain full of knowledge and memories.

- SUMAN S MURTHY
MEGHNA KULKARNI

Behind you, all your memories ,
before you, all your dreams,
around you, all who love you,
within you, all you need.

Here is a glimpse of the years spent in college by the Batch of 2018.

FUTURE BOUND

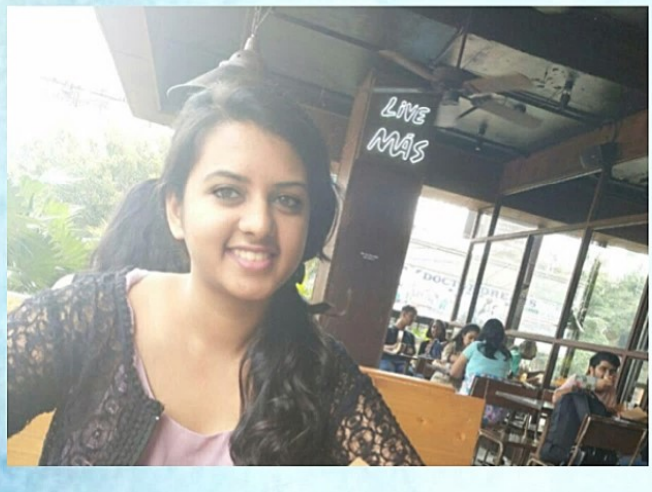
VINUTHA G N

Four years of engineering have been fantastic for me and I am grateful to my college, department, professors and my friends for this. I have made innumerable memories during UTSAV, PhaseShift, trips, industrial visits and not to forget, during exams. Today, when I look back at all those, it brings a smile on my face.
I will cherish all of them forever. Thank you BMS

MEGHANA A

“It’s ok to have your eggs in one basket as long as you control what happens to that basket”
- Elon Musk

SPANDANA SKANDAN



From feeling lonely and weird on the first day of college to finding my best friend in someone I sat next to on the same day- it's been a long way.I would like to thank my professors for helping me evolve and gain a lot of knowledge by arranging a lot of technical workshops and industrial visits . BMS is an emotion in itself.

SRI RAJIV N

BMSCE-The best platform to explore the vivid opportunities around and to develop various skills. It is not just the academics- the events, lectures from experts around the world, who visit college and share their experience, and training on technical topics, all of which will lead you to achieve something bigger than what you can imagine. And this prepares you to face the world and handle tough situations.

PRADYUMNA M

The best decisions aren't made with your mind but with your instinct.

- Lionel Messi

SWETHA LAKSHMI A

BMSCE has given me the best memories of my life. I have got the best set of friends after entering BMSCE. The birthday celebrations, outings and picnics with friends, being tensed for projects and presentations, silly fights and then the patchups, taking selfies with the craziest filters, all have made life at BMSCE more colorful. Volunteering and participating for the technical fest, PhaseShift and cultural fest, Utsav is always exciting. Thanks to BMSCE ,for all the wonderful memories that I will cherish throughout my life.

JAHNAVI B GOWRI

Engineering at BMSCE has been an uplifting journey. The memories made and memories shared here will always remain among the most cherished ones. It has been an amazing experience to be a part of Medical Electronics Department, which was more like home to us.

KHATHIJA ADIL

In these four years at BMSCE, I have made amazing friends and have made some great memories with them. I would give anything to turn time around and go back to the first day of college. Medical Electronics Department is a complete family by itself and I am proud to be a part of it.

P.S: But every time I got a haircut no one knew.

AMRUTHA R

" It was fiery and pure, the time I long for. Do you hear me? If you hear me, answer, my '90s Me. - Yoon Jae"

MANAN SINGHAL

A PFET loses its identity without its circle ..... so FIND your circle and know that some things are unstoppable despite the circumstances.

SUSHMITHA UDAYA GUDIGAR

BMSCE is one of the best places to experience college life. It gives us a wonderful atmosphere and a great learning experience from the learned teachers and professors here. The college as a whole, provides us with so much knowledge and enlightens the heart and soul. The cultural diversity in the college has helped many students including me in opening up to many new thoughts and ideologies.During the four years, I have made quite a few memories in college by taking part in all feats hosted by college and other co-curricular activities. . Thank you everyone for making me a part of BMSCE. There will never be a place like BMSCE ever!

VAISHNAVI T N

Being a part of BMSCE for four years was an incredible journey -alongside my classmates, teachers, and seniors, who always extended their support. Four years of engineering feels like a very short period, because of all the good times we've had. I have made some of the best memories during this journey. The most enjoyable moments were those spent with our seniors during the tests. It was a privilege being the placement coordinator for ML 2017-2018.

Art is the accomplishment of our desire to find ourselves among the phenomena of the external world.
-Richard Wagner

ARTIST'S CORNER

ANVITHA
3rd YEAR

ANVITHA
3rd YEAR

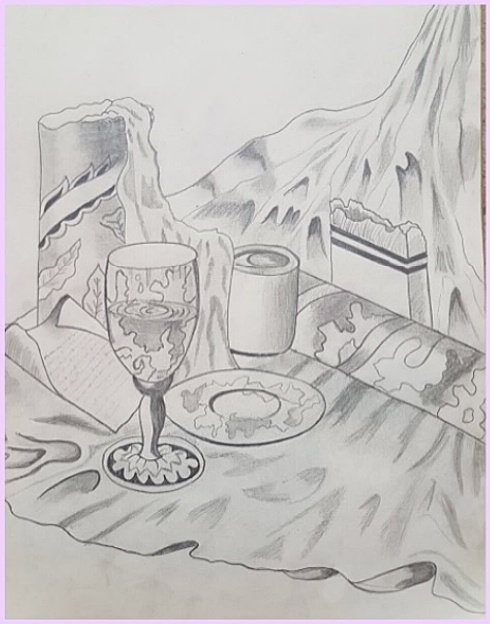
SUMAN S MURTHY
3rd YEAR

SUMAN S MURTHY
3rd YEAR

SUMAN S MURTHY
3rd YEAR

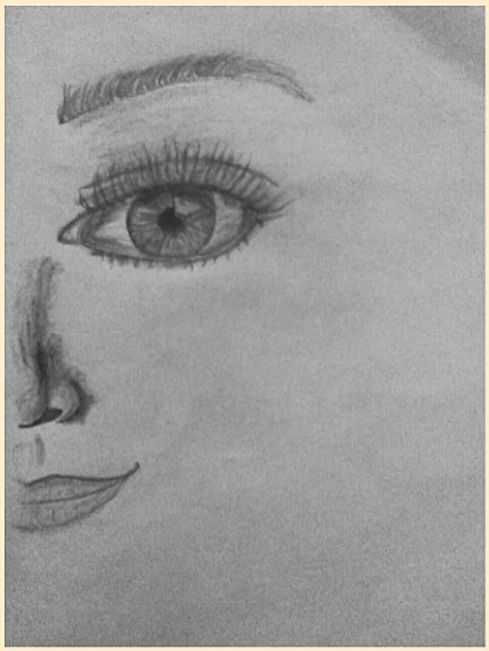
SUMAN S MURTHY
3rd YEAR

ANVITHA
3rd YEAR



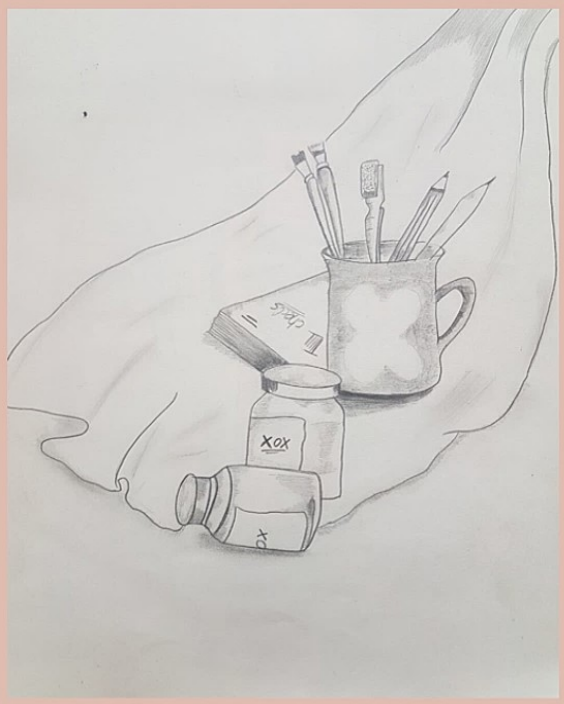
ANANYA MADHAV
1st YEAR

NEHA SHREEDHARALA
1st YEAR



NISARGA ANIL
2nd YEAR

DHEERAJ P
2nd YEAR



ANANYA MADHAV
1st YEAR

NISARGA ANIL
2nd YEAR

DHEERAJ P
2nd YEAR

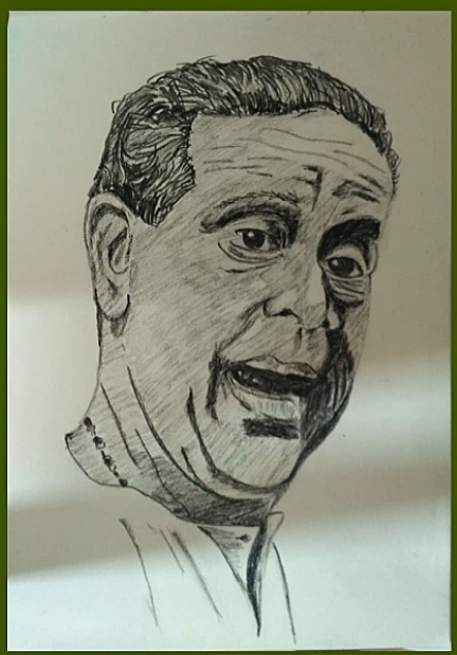
SANDEEP KUMAR
2nd YEAR

AVINASH
3rd YEAR

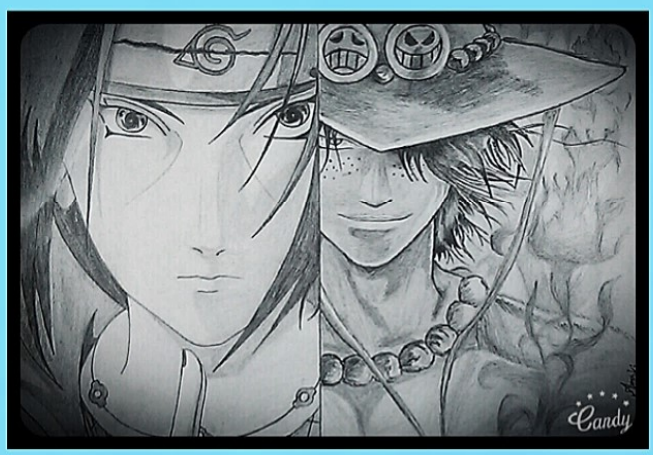
AVINASH
3rd YEAR

SANDEEP KUMAR
2nd YEAR

PRAJNA SHETTY
2nd YEAR



PRAJNA SHETTY
2nd YEAR



AVINASH
3rd YEAR


RAMAIAH
Workshop