



# BIO-TRENDZ OFFICIAL NEWSLETTER



## DEPARTMENT OF BIOMEDICAL ENGINEERING

Accredited by NBA, New Delhi

### MESSAGE FROM THE HOD

Our mission and vision is to empower students with sound knowledge and raining both at the academic level of Engineering and in the highly Competitive Global Industrial Market. Students are facilitated with Personality Development Program (PDP Classes), Communication Classes for better placements. Competitive exams, quizzes and other co curricular activities are the part of schedule. Sports, Co curricular and extracurricular activities takes place at Institute level and students participate in various Intra-College, Inter-College, Inter-University fests/competitions. Our Students have their own Band group and won many prizes in different competitions. Department works for overall growth of students and inculcate the qualities/features that are required and acceptable by Society. Faculty/Students take initiative for Social causes at individual level and as a team under different Banners/Clubs of the Institute.



### ASSOCIATION ACTIVITIES

#### Webinar

- In Association with IEEE SB, EMBS chapter, BME- BIONIKX organized a Webinar on **'Importance of Calibration and Quality Assurance Test in the field of Biomedical Engineering'** on 07.08.2021. C.P.Remya, Technical Manager, Biomedical Techniques, Calibration Experts, Thrissur, Kerala was the resource person and the Chief Guest.
- Organized a Webinar on **'Biomedical – An AI of Hospital'** on 13.08.2021. Mrs.E.Rama Prabha, General Manager, Lotus Hospital, Erode was the Chief Speaker.
- Association of BME - BIONIKX in Association with IEEE SB, EMBS organized a Webinar on **'Big Awareness Session'** on 18.08.2021. Mrs.Sumithra, Pre-Incubation and BIG Program Manager, IITM HTIC MedTech Incubator was the resource person and the Chief Guest.

#### Competition

Association of BME- BIONIKX conducted a Competition on 21.08.2021 on the topic of **'Mind O Pedia'**. The following students were awarded with prizes

NAME & CLASS	PRIZE
Niranjana R - II BME B Suba Shree P - III BME B Catherine Biju- III BME A	I
Askilla P - IV BME A Shanmugapriya M- IV BME B	II
Sangeetha S- IV BME B	III

## Webinar

Association of BME- BIONIKX in Association with IEEE SB, EMBS organized a webinar on **‘Biosensors in IoT’** on 28.08.2021. Mr.M.Parthiban, Technical Manager, Caliber Embedded India Pvt.Ltd., Salem was the Resource Person and the Chief Guest.

## Inaugural Function and a Guest Lecture

Association of BME- BIONIKX in Association with IEEE SB, EMBS Inaugural Function & Online Guest Lecture on **‘AWS (Amazon Web Services) in Health Care’** on 04.09.2021. Mrs.Reegana Saleem, Senior Project Engineer, Wipro Technologies, Chennai was the resource person and the Chief Guest.

## Live Workshop

Association of BME- BIONIKX in Association with IEEE SB, EMBS and BMESI student chapter organized a live Workshop on 17.09.2021. The session on **‘Virtual Visit to Endoscopy Suit’** was handled by Dr.S.Easwaramoorthy, MS, FRCS, Chief Surgeon, Department of Minimal Access Surgery, Lotus Hospital, Erode & **‘Endoscopy- Preventive Maintenance and Trouble Shooting’** was taken by Er.Praveen Shankar, Officer- Field Service, Olympus Medical System, India Private Limited, Chennai.

## Inter Departmental Paper Presentation

Association of BME- BIONIKX in Association with IEEE SB, EMBS and BMESI student chapter organized an Inter Departmental Paper Presentation BIOPAPYRUS on 01.11.2021. Students presented the topics related to Cloud computing, Advancement in AI, Recent trends in Green Energy Electrical Power Converter, 3D Printing, Digital Healthcare, Virtual Reality in Healthcare. 40 students were participated and the following students were awarded the prizes.

Name	Class	Prize
Samuel D Vimalanadhan S	IV MECH	I
Aravind Karthik T	II ECE	II
Catherine Biju	III BME	III

## Demo session

Association of BME- BIONIKX in Association with IEEE SB, EMBS and BMESI student chapter organized a live demo session for Third and Final year students on the topic **‘Syringe pump’** on 08.11.2021. M.Sarvesh kumaran, Akas Infusions, Coimbatore was the resource person and the Chief Guest.

## Value Added Course

Association of BME- BIONIKX conducted a value added course for Third year students on the topic **‘Biosignal Image Analysis using Graphical System Design’** from 13.12.2021 to 16.12.2021. Mr.S.Esakkiraja, Senior Application Engineer, VI Solutions, Bangalore was the resource person.

## MoUs SIGNED

Organization with which MoU is signed	Name of the Institution/ Industry/ Corporate house	Month and Year of signing MoU	Duration
Company	Caliber Embedded Technologies India Private Limited, Salem	10.07.2020	Continuous

## PROGRAMS ATTENDED/ORGANIZED BY THE FACULTY MEMBERS

### PATENT

**Mr.K.Rajaram** published a Patent on ‘Smart Versatile Monitoring System’ on 24.12.2021.[Application Number: 2021141058585].

### GRANT RECEIVED

**Mr.K.Rajaram** received the Travel Grant Rs.20,000 from Indian Association of Gastrointestinal Endosurgeons for attending the EFIAGES 2021 Fellowship Program at Sri Ramachandra Medical College ,Chennai during 24.11.2021 to 26.11.2021.

### JOURNAL PUBLICATIONS

**Ms.Sudha Subramaniam**, ‘Measurement of Intima-Media Thickness Depending on Intima Media Complex Segmentation by Deep Neural Networks’ , Journal of Medical Imaging and Health Informatics, pp.2546–2557, October 2021.

### BOOK PUBLICATIONS

Book Title	Chapter Name	Author Name	Page No.	Year of Publishing	Publisher Name	ISBN No.	DOI. No.
Smart Systems for Industrial Publications	Introduction to Artificial Intelligence	Dr.S.Mangai Ms.R.Vishalakshi	141-171	First Edition	Scrivener Publishing LLC	9781119762010	10.1002/9781119762010

### NPTEL

**Mr.K.Rajaram** has successfully completed the NPTEL online certification (8 weeks) course funded by the ministry of HRD, Govt. of India, IIT Kharagpur on the title ‘NBA Accreditation and Teaching – Learning in Engineering (NATE)’ with **Elite** Certification.

**Mr.N.N.Baalakumar** has successfully completed the NPTEL online certification (8 weeks) course funded by the ministry of HRD, Govt. of India, IIT Kharagpur on the title ‘NBA Accreditation and Teaching – Learning in Engineering (NATE)’.

### FDP/STTP

Name	Program	Title	Place	Date
Mr.K.Rajaram	ATAL FDP	Augmented Reality and Virtual Reality	Gnanamani College of Technology	07.06.2021 - 11.06.2021
Mr.K.Rajaram	ATAL FDP	Innovation in Telemedicine in Rural India enabled by advancements in	R.M.K. Engineering College	15.06.2021 - 19.06.2021

		Artificial Intelligence, Medical Devices and Internet of Things		
Dr.S.Mangai Dr. N. Jeyashanthi Dr.P.Ravikumar Ms.C.Radhika Ms.S.Sudha Ms.S.Yamuna Devi Ms.S.Maheswari Mr.V.Loganathan Mr.S.Govindaraj Ms.M.Sharmila Ms.R.Indhumathi	Online FDP	Inculcating Universal Human Values in Technical Education	All India Council for Technical Education (AICTE) ,New Delhi	26.07.2021 - 30.07.2021.
Ms.S.Sudha	ATAL FDP	Artificial Intelligence and Geospatial Technology in Surveillance for Infectious Disease	KCG College of Technology, Chennai	23.08.2021- 27.08.2021
Ms.S.Sudha	AICTE sponsored STTP	Advanced technology to bridge the gap between Medical Science and Engineering for the benefit of mankind	JIS College of Engineering, Kalyani	23.08.2021- 28.08.2021
Dr. N. Jeyashanthi	Online FDP	Research Proposal to Patenting – A Road Map	SrimadAndavan Arts and Science College, Trichy	25.08.2021- 27.08.2021
Ms.A.Kalyani	ATAL FDP	Fundamental of Artificial Intelligence	College of Technology and Engineering, Udaipur.	13.09.2021- 17.09.2021

### WEBINAR
























Name	Title	Place	Date
Mr.V.Loganathan	Digital Storage and Memory for AI at the Edge and in Data centers	Panimalar Institute of Technology, Chennai.	25.08.2021

### WORKSHOP

Name	Program	Title	Place	Date
Mr.N.N.Baalakumar Mr.V.Loganathan	CSIR Sponsored National Level Workshop	Application of Laser Flow Cytometry using Optimized Photo simulation of Bio-Active Neurons for Enhancement of Personalized Neuro prosthetics	Dr.N.G.P. Institute of Technology, Coimbatore	25.11.2021 - 26.11.2021

# STUDENT'S ACTIVITIES

## PLACEMENT DETAILS

<i>Cognizant Technology Solutions (CTS)/ Corro health care/ Capgemini</i>		<i>Infosys Limited/ Technologies Alam drive</i>		<i>Wipro</i>		<i>Cognizant Technology Solutions (CTS)/ Corro health care</i>									
															
GOWTHAM PRASATH E IV BME A		KAVIBALAN IV BME A		MALAVIKA R IV BME B											
<i>Zifo RnD Solutions/ Wipro Technologies</i>		<i>Wipro Technologies/ Corro health care</i>		<i>Corro health care/Capgemini</i>											
															
NITHESH KUMAR S IV BME B		SUJITHRA M V IV BME B		ARAVINTH K IV BME A											
<i>Corro health care/ Face Academy</i>		<i>Infosys Limited/ Corro health care</i>		<i>Wipro Technologies</i>											
															
AASHIYA SULTHANA M IV BME A		PEACHI PRIYA G IV BME B		AARTHY S IV BME A		ANJANA T IV BME A		ASKILLA P IV BME A		ASWATH C IV BME A					
<i>Wipro Technologies</i>															
															
BABYSHALINI J IV BME A		GOKULNATH S IV BME A		JAMUNA P IV BME A		KAMALI AISHWARYA M IV BME A		KAVYA K K IV BME A		MUKILAN .R IV BME B					
<i>Wipro Technologies</i>			<i>Cognizant Technology Solutions (CTS)</i>				<i>DXC Technology</i>								
															
SHREE SHAMBHAVI S IV BME B			ROHITH P IV BME B				LINGESHWARAN T IV BME B					HEMALATHA M IV BME A		PAVITHRA R IV BME B	

**DXC Technology****SANGEETHA S**  
IV BME B**SHIMRIN SULTHANA J**  
IV BME B**SHANMUGAPRIYA M**  
IV BME B**ANUVARSHINI P**  
IV BME A**BREEZY S**  
IV BME A**HARINI S**  
IV BME A**Tata Consultancy Services****kaar technologies****Capgemini****NAVEEN P**  
IV BME B**ELAKKIYA G**  
IV BME A**GANESAN V**  
IV BME A**DIVIN KUMAR S**  
IV BME A**MAHIMA  
ABRAHAM P J**  
IV BME B**SATHISH KUMAR R**  
IV BME B**Capgemini****Focus Edumatics****ZIFO RnD Solutions****DHARANI B**  
IV BME A**KAVITHA S**  
IV BME A**KARTHIKEYAN S**  
IV BME A**GOKULA KRISHNAN N**  
IV BME A**Corro health care****YALINI A**  
IV BME B**ABINAYA R**  
IV BME A**BABITHA M**  
IV BME A**POONGOTHAI S**  
IV BME B**REKHA J**  
IV BME B**PROFICIENCY WINNERS****2017 2020 BATCH****SHANMUGAPRIYA.M**  
IV BME B**SHANGAMITHRA.S**  
IV BME B**ALAGU CHITHRA DEVI P**  
IV BME A

### 2018 2021 BATCH



**KAVYA K K**  
III BME A



**NITHESHKUMAR S**  
III BME B



**ASKILLA P**  
III BME A



**PREETHI S**  
III BME B

### 2019 2022 BATCH



**JANANI G K**  
II BME A



**SUBA SHREE P**  
II BME B



**DISHA MAHZOOZA J**  
II BME A

### 2020 2023 BATCH



**KEERTHANA A**  
I BME A



**NAVEENKUMAR G**  
I BME A



**SHAJNA A**  
I BME B



**SUBARNA**  
**DHANAVANTHNI S**  
I BME B



**DEEPASHRI P**  
I BME A



**KAVYA S**  
I BME A

### PROGRAMS ATTENDED

#### WEBINAR

NAME OF THE STUDENT	TOPIC	DATE	CONDUCTED BY
JENIFER SWATHI.R	DIFFERENT TYPES OF SKIN CANCER USING CNN	03.07.2021	MVR COLLEGE OF ENGINEERING & TECHNOLOGY
VISHNU.M.K	HOW TO CRACK ZIFO PLACEMENT	24.07.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
VISHNU.M.K	CHASE YOUR DREAMS	30.07.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
RISWANTH.S	CHASE YOUR DREAMS	30.07.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
DIVYA.M DIVYA.K AGALYA.S GAYATHRI.S DEEPIKA.S MADHUMITHA.Y CHANDRALEKHA.A KAVIN RAJ.S.A MADHUBALA.E MADHUBALA.E	IMPORTANCE OF CALIBRATION AND QUALITY ASSURANCE TEST IN FIELD OF BIOMEDICAL ENGINEERING	07.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

NIVETHA SRI.G POONGOTHAI.S PREETHI.S BABYSHALINI.J KAMALI AISWARYA.M NANDHINI.S SANGEETHA.T	IMPORTANCE OF CALIBRATION AND QUALITY ASSURANCE TEST IN FIELD OF BIOMEDICAL ENGINEERING	07.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SNEHA.R KAMALA KANNA.G.R BALA SUBRAMANIAN.G MAHESH KUMAR.M	IMPORTANCE OF CALIBRATION AND QUALITY ASSURANCE TEST IN FIELD OF BIOMEDICAL ENGINEERING	07.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
JAYA VIVEKA.B SINDHU.R ANNAPOORANI. K LEKHA.C DURGESWARI.B ARSHA.V	IMPORTANCE OF CALIBRATION AND QUALITY ASSURANCE TEST IN FIELD OF BIOMEDICAL ENGINEERING	07.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
NIVETHA SRI.G SANGEETHA.T CATHERINE BIJU SANTHOSHKUMAR.T PRAVEENA.P SOWMYA.S SUGEETHA.M.A SUPRITHA.S,VAISHNAVI.V RISWANTH.S DURGESWARI.B DISHA MAHZOOZA.J	BIOMEDICAL-AN AI OF HOSPITAL	13.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
AGALYA.S,DIVYA.K MADHUMITHA.Y PREETHI SRINIVASAN SARVESH KUMARAN SIVASAKTHI.A SOWBARNIKA SRY.A.P SHOBIKA.T,SHAJNA.A SOWSHIGA.K.R SUBARNA, SWETHA.D DHANAVANTHINI.S	BIOMEDICAL-AN AI OF HOSPITAL	13.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SUBIKSHA.A TAMILARASAN.S YASWANTH.S RAMYA.K, VANATHI.S SAINHANDHINI.C.K SANDHIYA.S SANTHIYA.R	BIOMEDICAL-AN AI OF HOSPITAL	13.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SINDHU.R,DURGESWARI.B MADHUBALA.E CATHERINE BIJU LEKHA.C, JAMUNA.P ANUVARSHINI.P BABYSHALINI.J KAMALI AISHWARYA.M SWEHA.M	AWS IN HEALTH CARE	04.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
JASMIN.N,SINDHU.R POONGOTHAI.S PREETHI.S,AGALYA.S ANNAPOORANI.K KAMALA KANNA.G.R	AWS IN HEALTH CARE	04.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY



DIVYA.K, JANANI.G.K JENIFER SWATHI.R SOWSHIGA.K.R SOWBARNIKA SRY.A.P SHAJNA.A,KAVYA.S AISVARYA.A.R DURAIMURUGAN.P JAYA VIVEKA.B SUBA SHREE.P NESHAA THEVI.A.M			
SNEHA.R NIVASH.T.R	LIFE SAVER OF MODERN HUMANS	07.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
UVANANDHINI.B SNEGA.R,NESEKA.S SOWMIYA.K SINDHU.R,SOWMYA.S RAMYA SRI.K DURAIMURUGAN.P HRITHIKA.A	ENDOSCOPY- PREVENTIVE MAINTENANCE AND TROUBLESHOOTIN G	17.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SANTHIYA.R,SWEHA.M VANATHI.S KAMALI AISHWARYA.M ABINESH.K,DIVYA.K YESWANTH.B SUBHASRI.V NESHAA DEVI.A.M RANJITH KUMAR.R SUBARNA DHANAVANTHINI.S	ENDOSCOPY- PREVENTIVE MAINTENANCE AND TROUBLESHOOTIN G	17.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SOWMIYA.S,SHAJNA.A SHARMIKA.M SOWBARNIKA SRY.A.P SWETHA.D, PRAVEEN.K SABHARI GANESAN.T.S POOVARASAN.I SINDUJA.B TAMILARASAN.S	ENDOSCOPY- PREVENTIVE MAINTENANCE AND TROUBLESHOOTIN G	17.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SNEGA.R,NESEKA.S SOWMIYA.K RAMYA SRI.K DURAIMURUGAN.P	LIVE ON UPPER GI- ENDOSCOPY DIAGNOSTIC PROCEDURES	17.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SAINHANDHINI.C.K PRIYADHARSHINI.K SANTHIYA.R SUBIKSHA.A JANANI.G.K,ABINESH.K	LIVE ON UPPER GI- ENDOSCOPY DIAGNOSTIC PROCEDURES	17.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
DIVYA.K,YESWANTH.B VANATHI.S,SUBARNA DHANAVANTHINI.S PRAVEENA.P SABARIKA.B.D SUPRITHA.S,RISWANTH.S SUBA SHREE.P NESHAA THEVI.A.M RANJITH KUMAR.P SOWSHIGA.K.R SOWMIYA.S SANDHIYA.S SHAJNA.A,SHOBICA.T SHARMIKA.M SOWBARNIKA SRY.A.P SWETHA.D,SIVASAKTHI.A	LIVE ON UPPER GI- ENDOSCOPY DIAGNOSTIC PROCEDURES	17.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

PRAVEEN.P SABHARI GANESAN.T.S UVANANDHINI.B YASWANTH.S SANTHOSHKUMAR.T PRAVEEN.K, SWEHA.M TAMILARASAN.S UMAMAHESWARI.M			
PRAVEEN.K SWETHA.D	EFFECTIVE COMMUNICATION	23.10.2021	E.S.ARTS AND SCIENCE COLLEGE
SWETHA.D	MEDICAL IMAGE OPTIMIZATION TECHNIQUES FOR BIOMEDICAL APPLICATIONS	26.10.2021	BANNARI AMMAN INSTITUTE OF TECHNOLOGY
SWETHA.D	MEDICAL DEVICES AND DIAGNOSTICS	09.11.2021	BANNARI AMMAN INSTITUTE OF TECHNOLOGY
SANTHOSH KUMAR.T AISVARYAA.R KEERTHANA.A DEVADHARSHINI.G KAVYA.S,SOWSHIGA.K.R SOWMIYA.S,SOWMIYA.S SHOBICA.T	IEEE XPLORE	12.11.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SANTHIYA.R, ARUNA.R SANDHIYA.S PRIYADHARSHINI.K SUPRITHA.S RISWANTH.S BALADHINESH.M CHRISTINA JENIFER.F	IEEE XPLORE	12.11.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
NANDHINI.S TAMILARASAN.S AHALYA.K HEMANANDHINI.J HRITHIKA NAVEENKUMAR.G DURAIMURUGAN.P NANDHITHA.R	IEEE XPLORE	12.11.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
DURAIMURUGAN.P	THE FUTURE OF MOBILE APP INDUSTRY	24.11.2021	HUAWEI CONSUMER BUSINESS CLOUD SERVICE

### WORKSHOP

NAME OF THE STUDENT	TOPIC	DATE	CONDUCTED BY
GAYATHRI.S BOOMIKA.C,KIRUTHIKA.C THAVAMANI.S,DIVYA.M MADHUMITHA.Y,DURGESWARI.B JENIFER SWATHI.R	ELECTRONIC CIRCUITS AND PCB DESIGN	12.07.2021 to 16.07.2021	PANTECH E-LEARNING
MADHUMITHA.Y SINDHU.R,GAYATHRI.S JENIFER SWATHI.R CHANDRALEKHA.A	LEARN TO CODE FOR WEB – JAVA PROGRAMMING	19.07.2021 to 23.07.2021	PANTECH E-LEARNING
SUSHMA.N.S, SANGAVI.S CHANDRALEKHA.A MADHUMITHA.Y DURGESWARI.B,SINDHU.R JENIFER SWATHI.R POOMANI SOUNDHARYA.S	ARDUINO PROGRAMMING	26.07.2021 to 30.07.2021	PANTECH E-LEARNING

SUSHMA.N.S SANGAVI.S,KAMALI.A DURGESWARI.B,SINDHU.R CHANDRALEKHA.A,BOOMIKA C	LEARN MATLAB WITH IMAGE PROCESSING	02.08.2021 to 08.08.2021	PANTECH E-LEARNING
MADHUMITHA.Y	LABVIEW	09.08.2021 to 11.08.2021	IEEE COMMUNICATIONS SOCIETY MADRAS CHAPTER
SWETHA.D JENIFER SWATHI.R	LIVE WORKSHOP ON OXYGEN CONCENTRATOR	04.09.2021	BANNARI AMMAN INSTITUTE OF TECHNOLOGY
RANJITH KUMAR.P RISWANTH.S, NIVASH.T.R SUBA SHREE.P YESWANTH.B	DEEP LEARNING USING MATLAB	27.09.2021 to 03.10.2021	PANTECH SOLUTIONS
VISHNU.M.K,YESWANTH.B RANJITH KUMAR.P SUBA SHREE.P RISWANTH.S	SELF DRIVING CAR	21.10.2021 to 23.10.2021	PANTECH SOLUTIONS
VISHNU.M.K	JOB INTERVIEW WORKSHOP	15.12.2021 to 19.12.2021	MY PLACEMENT COACH

### **QUIZ**

<b>NAME OF THE STUDENT</b>	<b>TOPIC</b>	<b>DATE</b>	<b>CONDUCTED BY</b>
SOWSHIGA.K.R	INTERNATIONAL E-QUIZ ON ENGLISH VOCABULARY	13.07.2021	KPR COLLEGE OF ARTS SCIENCE AND RESEARCH
SHAJNA.A UMAMAHESWARI.M	UNIVERSAL E-QUIZ ON FREEDOM INDIA	06.08.2021	KPR COLLEGE OF ARTS SCIENCE AND RESEARCH
SUBARNA DHANAVANTHINI.S	ONLINE QUIZ	15.08.2021	VELLALAR COLLEGE FOR WOMEN ERODE-12
PREETHI.S, SINDHU.R ANUVARSHINI.P PEACHI PRIYA.G LEKHA.C,DIVYA.M GAYATHRI.S MADHUMITHA.Y	MIND O PEDIA	21.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
JANAPRIYA.M NANDHINI.S	QUIZ CONTEST	29.08.2021	ROTARACT CLUB VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SINDUJA.B,VANATHI.S SOWSHIGA.K.R ARPUTHA.S AMRUTHAVARSHINI.B DEEPASHRI.P DEVADHARSHINI.G HEMANANDHINI.J NIVETHA SRI.G	QUIZ CONTEST	29.08.2021	ROTARACT CLUB VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SWETHA.D VAISHNAVI.V SUBHASRI.V	INTERNATIONAL E-QUIZ ON ENGLISH VOCABULARY	07.09.2021	KPR COLLEGE OF ARTS SCIENCE AND RESEARCH
UMAMAHESWARI.M	GLOBAL H-QUIZ 2021	09.09.2021	KPR COLLEGE OF ARTS SCIENCE AND RESEARCH
NIVASH.T.R	QUIZ CONTEST	12.09.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
DEVADHARSHINI.G ARUNA R KEERTHANA.A AMRUTHAVARSHINI.B DEEPASHRI.P	QUIZ SERIES ON SUSTAINABLE DEVELOPMENT GOAL 2	14.09.2021	K.RAMAKRISHNAN COLLEGE OF ENGINEERING

NEGA.R,AISVARYAA.R DURAIMURUGAN.P CHRISTINA JENIFER.F HARITHA.J.D JANAPRIYA.M LAKSMAN PRANAV.S SIVASAKTHI.A NAVEENA.N,NIVETHA.S.B HEMANANDHINI.J HARINI.K,KISHORE.R NIVETHA SRI.G	QUIZ SERIES ON SUSTAINABLE DEVELOPMENT GOAL 2	14.09.2021	K.RAMAKRISHNAN COLLEGE OF ENGINEERING
NIVETHA.S.B HARINI.K,ARPUTHA.S.S AMRUTHAVARSHINI.B NAVEENKUMAR.G	A NATIONAL LEVEL QUIZ COMPETITION FOR STUDENTS IN VIEW OF WORLD OZONE DAY	16.09.2021	KONGU ENGINEERING COLLEGE
SUBARNA DHANAVANTHINI.S	NATIONAL LEVEL ONLINE QUIZ ON MAHATMA GANDHI- AN IMMORTAL NATIONAL LEADER	02.10.2021	VELLALAR COLLEGE FOR WOMEN, ERODE-12
SHAJNA.A	INTERNATIONAL E-QUIZ ON ENGLISH VOCABULARY	07.10.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

#### **SPOKEN TUTORIAL PROJECT AT IIT BOMBAY**

<b>NAME OF THE STUDENT</b>	<b>TOPIC</b>	<b>DATE</b>	<b>CONDUCTED BY</b>
JANANI.G.K, SINDHU.R CATHERINE BIJU JENIFER SWATHI.R DILIP.D,RISWANTH.S NESHAA THEVI.A.M	CPP TEST	07.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
PREETHI SRINIVASAN THAVAMANI.S SINDHU.R,JASMIN.N	SCILAB TEST	07.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SNEHA.R,NESEKA.S MADHUBALA.E YASWANTH.B	CPP TEST	07.08.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SUBARNA , PRAVEENA.P DHANAVANTHINI.S	ESIM TEST	09.10.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
PRASITHA.L RANJITH KUMAR.P NIVASH.T.R, SUBA SHREE.P NESHAA THEVI.A.M SANGEETHA.T	ARDUINO	09.10.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
HEMANANDHINI.J TAMILARASAN.S DURAIMURUGAN.P RAMYA.K,YASWANTH.S UVANANDHINI.B RISWANTH.S,YESWANTH.B	ESIM TEST	09.10.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SOUMIYA.K, SOBIA.M, SOWMIYA.K	ARDUINO	09.10.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY
SNEGA.R, RAMYA SRI.K MADHUBALA.E ABINESH.K ,NESEKA.S DIVYA.K,SINDHU.R	ARDUINO	09.10.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

## PRIZE WINNERS

NAME OF THE STUDENT	TOPIC	DATE	CONDUCTED BY	PRIZE
T.SANGEETHA S.PREETHI	MEMBERSHIP DEVELOPMENT ACTIVITIES- COORDINATION CONTEST	05.06.2021	IEEE MADRAS SECTION & JEPPIAR COLLEGE OF TECHNOLOGY, CHENNAI	3D PRIZE
NAVEEN KUMAR.G	Mr & Ms CHEF(COOKING COMPETITION)	20.10.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY	Mr. CHEF TITLE WINNER
NAVEEN KUMAR.G	JUMBLE WORDS	16.12.2021	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY	1 <sup>st</sup> PRIZE

## LATEST BIOMEDICAL ARTICLES

### Fighting cancer that has spread to the bones

Some types of cancer are more difficult to treat than others. When cancer has spread to the bones, for example, there are few alternatives. Available treatments have major side-effects and are of varying efficacy. Fortunately, a Norwegian company has found a way to slow bone metastases. Building on research conducted at Oslo University Hospital, Radiumhospitalet, Algeta has developed a cancer drug based on radium-223, a radioactive iso to pe. While radium treatment of cancer was widespread in the past, it has more or less been replaced by alternatives with fewer side-effects. Algeta's breakthrough is a targeted drug that is highly precise and has a short half-life, thereby minimising side-effects. The drug was launched under the name Alpharadin, and is now called Xofigo. Some 1.3 million men are diagnosed with prostate cancer each year. Xofigo is used to treat prostate cancer when the cancer has spread to the bones, and is approved for use in both Europe and the US. Founded in 1997, Algeta was acquired by the multinational company Bayer in 2011. However, production and research activities are still located in Norway, where work is being done to develop similar methods for treating breast cancer and lung cancer.

**MADHUMITHA S**  
**III BME A**

### Norwegian invention isolates DNA from cells



**The world's first Pulsed Echo Doppler  
Flowmeter was developed in Norway.  
Norwegian Museum of Science and  
Technology**

In 1977, Professor John Ugelstad at the Norwegian University of Science and Technology managed to solve a problem that had been puzzling researchers for years: creating a set of microscopic beads of exactly the same size. The professor and his team then went on to make these uniform beads magnetisable, and found that they could be used to separate biological materials with extremely high precision. The company Dynal was founded shortly after to further develop and commercialise the technology. The beads were given the name Dynabeads and have since been used in isolating and removing cancer cells, isolating DNA, tissue-typing in connection with organ transplantation, and HIV research.

**SUPRIYA A**  
**III BME B**

### Mapping blood flow in the heart

Cardiovascular disease is the world's most common cause of death, and the risk increases with age. Cardiac tests are thus some of the most important and fundamental medical procedures there are. When doctors examine whether a heart is beating as it should be, they use ultrasound,

which provides a living picture of the heart's functioning. However, at the end of the 1970s there were no effective methods of obtaining a detailed picture of how the blood flows through the heart. This was remedied by the development of the world's first Pulsed Echo Doppler Flowmeter (PEDOF) at the Norwegian University of Science and Technology. GE Vingmed Ultrasound further developed and commercialised the PEDOF machine, advancing ultrasound technology by using the Doppler effect to create a precise picture of where and how fast the blood flows through the heart. This gave doctors a new, more accurate tool for diagnosing disease and irregularities, which is now used to examine roughly 200 000 hearts each day. Given that the global population is ageing and cardiovascular disease is becoming more prevalent, the demand for GE Vingmed Ultrasound's technology continues to grow. The technology, too, is steadily evolving. For example, the company recently launched the first pocket-sized ultrasound with two transducers in one probe, giving much greater flexibility in the use of ultrasound.

**HARIHARAN P**  
**II BME A**

## **Sustainable Agriculture and Food Production Technology**

Sustainable food producers have an important role to play in achieving the targets of the Paris Agreement. For Norwegian producers, smart and efficient food production technology will be critical to reducing emissions. The country already has one of the world's most modern and high-tech food production systems – with widespread, fast-paced digitalisation. Land-based food production in Norway has nearly doubled since 1960. Labour input, meanwhile, is 35 per cent lower than in 2000 thanks to use of advanced food technology. Norwegian dairy farmers, for example, lead the field in using milking robots. Technology can help farmers to improve animal welfare and sustainable food production, while saving time and money. Moreover, the technological transformation is attracting more young people to agriculture.

Norwegian innovators in food production are helping to modernise traditional agriculture. These include N2 Applied, whose on-farm system lets farmers produce fertiliser using locally sourced manure and renewable energy. Soil Steam International, meanwhile, has developed both mobile and stationary machines that use steam to clear soil of fungi, weeds, seeds and nematodes, without the use of pesticides. Sense, for its part, has developed irrigation sensors for reducing water loss.



Norwegian companies are also using their ingenuity to keep track of livestock. Nofence has created the world's first virtual fencing system for grazing animals. Find my, in turn, offers tracking collars that use GPS so farmers can monitor livestock on their smartphone. Norwegian robots may well become a fixture on farms. Saga Robotics has developed Thorvald – an autonomous agricultural robot that can carry out a variety of tasks in the field. Kilter, meanwhile, has developed an autonomous weeding robot that can reduce use of herbicides by 95 per cent.

**SUBAHASRI V**  
**II BME B**

## **Mobile e-health solution puts patient data at nurses' fingertips**

DNV Imatis delivers a mobile ICT solution for hospitals that gives healthcare workers access to real-time information anywhere they are. "We empower the mobile hospital workforce by helping them to communicate better and ultimately provide better patient care," says Baldur Johnsen, Vice President of International Business at DNV Imatis. Hospitals can be a demanding environment for healthcare workers. Doctors and nurses walk 6–8 km per shift, seeing patients, communicating with staff, and fetching equipment and supplies. When they need crucial information, they must access it from a stationary location such as an office or nurse's station, and usually their only mobile IT option is the cumbersome "COWS" (Computers on Wheels).



“Healthcare is struggling with using Information Technology that has been designed for office workers. The healthcare workforce is mobile, so clinical IT support needs to be mobile. You would think that IT suppliers to hospitals would have focused on mobility before now, but they haven’t,” explains Johnsen.

**SWETHA D  
II BME B**

### **Mobile e-health solution gives real-time access to patient data**

The IMATIS solution is an e-health platform that facilitates care coordination, mobile communication and task management in hospitals. The solution collects and aggregates data from hospital sensors and systems, such as electronic patient records, logistics and HR administration. Then healthcare workers can access this data in real time, regardless of their location, using apps and widgets on large touchscreens, tablets and smartphones. They can check lab results, order housekeeping and respond to emergency calls, to name just a few of the possibilities. “Our strategy is not to replace the existing technology our customers have. We augment the systems they already have and help them to realise more benefits,” says Johnsen.

**JAGAN S  
II BME A**

### **Better patient care in quieter surroundings**

The IMATIS solution dramatically increases productivity by making hospitals a truly mobile workplace. Doctors and nurses walk less, communicate more efficiently and spend more time with their patients. “If we can decrease the travel time in hospitals by 20 minutes per person and multiply this across all the various employees, this adds up to huge time savings. It increases the workers’ productivity and improves workforce management,” explains Johnsen.

In addition, the solution eliminates much of the hospital noise caused by round-the-clock alerts, monitors and machines. Instead, hospitals become much more serene, which creates a better healing environment for patients. Healthcare workers also benefit from a quieter, less hectic workplace. “Our customers tell us that they are seeing less absenteeism among the staff and more satisfied patients who can rest and heal better,” says Johnsen. Hospitals may also find that a better working environment will help to attract new, young talent.

**YALINI A  
IV BME B**

### **Hospitals seeking cost-saving solutions**

Many countries spend 8 to 17 per cent of their GDP on healthcare, and hospitals typically account for 60 per cent of this total. As healthcare costs rise and demand increases, hospitals are seeking ways to lower their expenses while maintaining patient care. Better productivity is one way to do this. “Technology is a solution for reducing healthcare spending,” says Johnsen. “The market potential for IMATIS is enormous. Vast sums of money are being spent on healthcare, but not many IT solutions have been able to increase productivity.” A pioneer in mobile e-health technology, DNV Imatis has been providing ICT solutions to Norwegian hospitals for 17 years. The IMATIS solution is now installed in hospitals worldwide.

**GANGA DEVI M  
IV BME A**

#### **NEWSLETTER EDITORIAL BOARD**

**FACULTY INCHARGE : Ms.R.INDHUMATHI M.E.,  
STUDENTS INCHARGE :**

**Final BME A: GOKULA KRISHNAN N, KAVIYA R**

**Final BME B: PRADEEP S, THAVAMANI S**

**III BME A: KANNATHASAN S, LEKHA C**

**III BME B: THIRUVENGADAM E P, SINDHU R**

**II BME A: JAGAN S, JANANI S V**

**II BME B: POOVARASAN I, RAMYA K**



# **BIO-TRENDZ**

## **OFFICIAL NEWSLETTER**



**DEPARTMENT OF BIOMEDICAL ENGINEERING**

**Accredited by NBA, New Delhi**

### **MESSAGE FROM THE HOD**

*The department vision is to be excellence in value based on Biomedical Engineering Education. The department strives to Impart knowledge and training of the highest standard. The objective of the department is to prepare students for a successful career in Industry, Research and Academics to meet the needs of growing technology. Our efforts are to develop the ability among students to synthesize data and technical concepts for application to product design. We provide an opportunity for students to work as members of a team on multidisciplinary projects. The department provides students with a sound foundation in the mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyze engineering problems and to prepare them for higher studies as well as research. We promote student awareness for life-long learning and to introduce them to professional ethics and codes.*



### **ASSOCIATION ACTIVITIES**

#### **ALUMNI MEET**

Organized an Alumni meet for BME students through Zoom meeting on 26.02.2022.

#### **WOMEN'S DAY CELEBRATION**

On International Women's day Celebration, A Guest Lecture was organized on the theme '**Women of Tomorrow**' on 08.03.2022. Dr.R.Parvathi, Controller of Examination, Vellalar College for Women was the Chief Guest and the resource person. She delivered a talk on the topic '**Create the identity you want for yourself**'.

#### **SEMINAR**

Association of BME- BIONIKX & BMESI Student chapter in association with Harvey Biomedical, Bengaluru organized a seminar on the topic '**Employment Opportunities in Medical Field**' on 14.03.2022. Mr.M.Ayyappadas, Founder & Director, Harvey Biomedical was the Chief Guest and the resource person.

#### **IEEE INAUGURAL FUNCTION**

In association with IEEE-VCET student branch & Engineering in Medicine & Biology Society (EMBS) organized an IEEE Inaugural function and a Guest lecture on '**Balancing College Life and Academics- A Journey**' on 18.03.2022. Dr.K.Balamurugan, AP/EEE, IEEE Senior Member, IEEE Student Branch Counselor, Sri Ramakrishna Engineering College, Coimbatore was the Chief Guest and the resource person. 123 students were participated in the event.



## WEBINAR

Association of BME – BIONIKX in association with IEEE-VCET student branch & Engineering in Medicine & Biology Society (EMBS) organized a Webinar on 'FPGA based Digital Filter Design for Biosignal Processing' on 12.04.2022. Dr. J. Prasad, Assistant Professor (Sl.Gr), Department of Electronics and Communication Engineering, KPR Institute of Technology, Coimbatore was the Chief Guest and the resource person.



## 17TH NATIONAL LEVEL TECHNICAL SYMPOSIUM

17th National level Technical Symposium BIOZEPHYR-2022 was organized by Association of BME on 26.04.2022. Mr. Sathyamurthy Chinnasamy, Vice President - Operations, Aquasub, Coimbatore & Mr. T. Narendran, Vice President - Operations, Aquasub, Coimbatore was the Chief Guest for the inaugural function. Around 80 papers were received from students of various Engineering Colleges across the country, of these 45 were selected for presentation. Balasubramanian Balavilathan, Department of Biomedical Engineering, Excel Engineering College, Coimbatore judged the papers presented. Other events such as Adzap, clip hunt were conducted. 25 students from various engineering colleges participated.



## INDUSTRIAL VISIT

Third year students undergone Industrial visit at **Aegous Healthcare Pvt. Ltd., Ernakulam, Kerala** on 30.04.2022. Aegous Healthcare Pvt Ltd conducts advanced training program for biomedical engineers in biomedical equipments under professional and skilled trainers. This training program provides Equipment Management, Service and Maintenance, Clinical application, Testing & Calibration.



## NATIONAL CONFERENCE



National Conference NCTEA 2022 was organized on the topic '**Recent trends in Engineering Applications**' on 06.05.2022. The Chief Guest of the conference was Dr. N.K. Karthikeyan, Prof & Head, Department of Information Technology, Coimbatore Institute of Technology, Coimbatore. 28 students from other colleges and 90 final students of BME were participated and presented the papers.

There were three parallel sessions out of which one was online mode, this was arranged to facilitate the students to participate from their own institution. Dr. R. Prabu, Professor and Head, KSR Institute

for Engineering and Technology, Tiruchengode and Dr.N.Sugumar, Professor and Head, Biomedical Engineering, Nandha Engineering College, Erode were the juries for the papers presented.

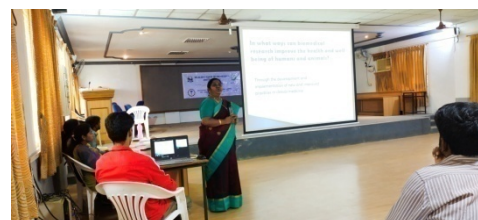
### PROJECT EXPO

The Project Expo -2022 "Engineering Innovations" was conducted by BME on 07.05.2022. The Chief Guest of the Project Expo was Mr. Nataraja Perumal Vasudevaraju , Global - HRSS, M&A Senior Project Manager, Genpact, Bengaluru. He encouraged the students and stated that India has great potential for research areas and requires contributions from youngsters and mainly from Engineering Students. Around 140 students were participated and 41 projects were displayed. The following students were awarded with cash prize.

PLACE / PRIZE	TITLE OF THE PROJECT	NAME OF TEAM MEMBERS	Amount (₹)
I	Iot Enabled Portable Phototherapy Unit With Non Invasive Bilirubin Measurement	Mohanakrishnan.D Sarvesh Kumaran.M Naveen.P,Sujithra.M.V	1000
II	Portable Ventilator Using Arduino Micro Controller	Nithish S, Rohith Kanna S Pradeep S, Surendhar C	750
III	Smart Multiple Attendance System Through Single Image	Mukilan R, Manibharathi M Shanmugavel S Thayananthan S	500

### GUEST LECTURE

Association of BME - BIONIKX in association with IEEE-V CET student branch & Engineering in Medicine & Biology Society (EMBS) organized a Guest Lecture on 'Research Challenges in Medical Application' on 13.05.2022. Dr.R.Malathi, Professor, Electronics and Instrumentation Engineering, Annamalai University, Chidambaram was the Chief Guest and the resource person. 62 students from Biomedical Engineering and Medical Electronics department were participated in the event.



### SPORTS DAY




21<sup>st</sup> sports day was celebrated on 20.05.2022. Mr.S.Prasanna Venkatesh was the Chief Guest of the function. Biomedical department has secured over all "Runner -up" and the faculty members have received prizes for their participation in various sport events.

### COLLEGE DAY & PLACEMENT DAY

21<sup>st</sup> College Day & Placement Day were celebrated on 21.05.2022. Thiru V.Thangavelu, Tata Consultancy Services, HR Screening, Chennai was the Chief Guest and distributed offer letters for the placed students. Students were enthusiastically participated in various Cultural events and awarded prizes.

## GRADUATION DAY

16th Graduation day was celebrated on 22.05.2022. The graduated students from 2016-2020 batch were received their graduation certificate. The following students secured rank

				
<b>1st</b> <b>DHARANI T</b> (2016-2020)	<b>2nd</b> <b>LAKSHMI S</b> (2016-2020)	<b>3d</b> <b>KEERTHANAA P</b> (2016-2020)	<b>4th</b> <b>JEFRI JACOB J</b> (2016-2020)	<b>5th</b> <b>DURGA R</b> (2016-2020)

## FAREWELL DAY CELEBRATION

Fare well day was celebrated for 2018-2022 batch final year students on 30.05.2022.

## AWARENESS PROGRAM

In association with Women Empowerment Cell organized a Guest Lecture on '**Improve your self-care and personal hygiene**' on 15.06.2022. Dr.V.Sudha Jothi, MBBS, DGO, IOG, Gynecologist, CK Hospital, Erode was the Chief Guest and the resource person.

## MOUs SIGNED

Organization with which MoU is signed	Name of the Institution. Industry. Corporate house	Month and Year of signing MoU	Duration
Company	M/S Operon Biotech and Healthcare	27.05.2022	Continuous

## PROGRAMS ATTENDED/ORGANIZED BY THE FACULTY MEMBERS

### JOURNAL PUBLICATIONS

**Ms.S.Sudha**, 'A Study on Statistical Analysis of Risk Factors in the Assessment of Cardiovascular Events in Indian Population', ECS Transactions, Volume 107, No. 1, April 2022.

**Dr.M.Ponni Bala**, 'An Early Prediction of Tumor in Heart by Cardiac Masses Classification in Echocardiogram Images using Robust Back Propagation Neural Network Classifier', Brazilian Archives of Biology and Technology, Volume 65, ISSN 1678-4324, April 2022.

### PATENT

**Dr.J.R.Rajalakshmi** published a Patent on 'Integrated Image Processing Based System for Tablets Identification Employing Mobile Application' dated on 25.02.2022 [Application Number: 202241006664 A].

### COPYRIGHTS

**Dr.S.Mangai** has received the copyright for 'An Investigation on the Performance Evaluation of a secured routing Protocol for Vehicular AdHoc Networks' dated 31/03/2022 with Registration Number-L-113928/2022 and Diary Number/ROC Number- 31971/2021-CO/L.

## CONFERENCES ATTENDED IN INTER INSTITUTES

**Ms.S.Maheswari** presented a paper titled 'Detection of Ovarian Cancer based on Segmentation using MATLAB' in CSIR Sponsored National Conference on Point of Care Technology: The Next Frontier in Personalized Medical and Health Care from 21.04.2022 to 22.04.2022 at Dr.N.G.P. Institute of Technology, Coimbatore.

**Ms.S.Maheswari** presented a paper titled 'Smart Ear Aid System for Deaf People in Public Area' in CSIR Sponsored National Conference on Point of Care Technology: The Next Frontier in Personalized Medical and Health Care from 21.04.2022 to 22.04.2022 at Dr.N.G.P. Institute of Technology, Coimbatore.

**Ms.R.Indhumathi** presented a paper titled 'Diagnosis and Detection of Skin cancer using Deep Learning' in CSIR Sponsored National Conference on Point of Care Technology: The Next Frontier in Personalized Medical and Health Care from 21.04.2022 to 22.04.2022 at Dr.N.G.P. Institute of Technology, Coimbatore.

## CONFERENCE ATTENDED

<i>NAME OF THE FACULTY</i>	<i>TITLE OF THE PAPER</i>	<i>NAME OF THE COLLEGE /INDUSTRY</i>
Ms.S.YAMUNA DEVI	DESIGN AND IMPLEMENTATION OF INTEGRATED E- VACCINATION CHIP ON COVID- 19	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Dr.S.MANIKANDAN	KNEE IMPLANT MONITORING	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Dr.N.JEYASHANTHI	AUTOMATIC DIAGNOSIS SYSTEM FOR DETECTING MELANOMA USING HISTOPATHOLOGICAL IMAGES	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms. S. MAHESWARI	SMART EAR AID SYSTEM FOR DEAF AND BLIND PEOPLE IN PUBLIC AREA	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Dr.P.RAVIKUMAR	GAIT ANALYSIS SYSTEM USING LABVIEW	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms.S. SUDHA	MONITORING AND ALERT SYSTEM FOR PATIENT IV-BAG FLUID AND PARAMETERS USING IOT	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Mr.K.RAJARAM	CLASSIFICATION OF ENDOSCOPY IMAGES USING ARTIFICIAL INTELLIGENCE	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms.M.SHARMILA	MALARIA DETECTION USING MACHINE LEARNING	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms. C.RADHIKA	IMPLEMENTATION OF BIOMETRIC AUTHENTICATION SYSTEM USING REDTACTON TECHNOLOGY	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms. D.SASIPREETHA	VISUAL CRYPTOGRAPHY FOR BIOMETRIC PRIVACY	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Mr.S.GOVINDARAJ	COVID -19 DETECTION AND CLASSIFICATION USING DEEP RESIDUAL NEURAL NETWORKS	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Dr.J.RAJALAKSHMI	BRAIN TUMOR DIAGNOSIS USING NOVEL IMAGE PROCESSING APPROACH	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Mr.N.N.BAALAKUMAR	COPD AND PNEUMONIA IDENTIFICATION AND CLASSIFICATION OF CHEST X-RAY AND SPIROGRAM USING DEEP LEARNING	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Dr.J.RAJALAKSHMI	911 SERVICES AND VITAL SIGN MEASUREMENT UTILIZING MOBILE PHONE SENSORS AND APPLICATIONS	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms.M.PONKARTHIKA	SMART MULTIPLE ATTENDANCE SYSTEM	VELALAR COLLEGE OF ENGINEERING

	THROUGH SINGLE IMAGE	AND TECHNOLOGY, ERODE
Mr.K.RAJARAM	NON-INVASIVE GLUCOSE ESTIMATION BASED ON INFRARED USING FINGER PLETHYSMOGRAPH	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Dr. N. JEYSHANTHI	PORTABLE VENTILATOR USING ARDUINO MICROCONTROLLER	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms. S. MAHESWARI	DETECTION OF OVARIAN CANCER BASED ON SEGMENTATION USING MATLAB	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms. C. RADHIKA	DESIGN AND IMPLEMENTATION OF HANDWRITING GUIDE FOR VISUALLY IMPAIRED	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms.S.SUDHA	DETECTION OF CARDIOVASCULAR DISEASE USING 1-D CONVOLUTION NEURAL NETWORK	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Ms.R.INDHUMATHI	DIAGNOSIS AND DETECTION OF SKIN CANCER USING DEEP LEARNING	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Dr .P. RAVIKUMAR	IOT ENABLED PORTABLE PHOTOTHERAPY UNIT WITH NON - INVASIVE BILIRUBIN MEASUREMENT	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Mr.V.LOGANATHAN	MEDICAL ASSIST ROBOT FOR ISOLATED WARD PATIENTS IN HOSPITAL	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
Dr.S.K.MANIKANDAN	DEVELOP AN ALGORITHM TO DETECT MUCORMYCOSIS (BLACK FUNGUS) DISEASE USING CNN	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE

### RESOURCE PERSON

Dr.J.R.Rajalakshmi acted as a Jury for the National Level Technical Symposium – Meditronz 2022 conducted by Biomedical Engineering of Erode Sengunthar Engineering College on 22.04.2022.

### FACULTY DEVELOPMENT PROGRAM

<i>Name of the Faculty</i>	<i>Title</i>	<i>Venue</i>	<i>Date</i>
Loganathan V	Emerging Applications in Image Processing	Rajalakshmi Institute of Technology	01.03.2022-05.03.2022
Indhumathi R	Emerging Applications in Image Processing	Rajalakshmi Institute of Technology	01.03.2022-05.03.2022
Baalakumar N.N	Emerging Applications in Image Processing	Rajalakshmi Institute of Technology	01.03.2022-05.03.2022
Ponni Bala M	Applications of Artificial Intelligence in Brain-Computer Interface	SR University, Hanumakonda	09.05.2022-13.05.2022
Govindaraj S	Applications of Artificial Intelligence in Brain-Computer Interface	SR University, Hanumakonda	09.05.2022-13.05.2022
Sudha S	Applications of Artificial Intelligence in Brain-Computer Interface	SR University, Hanumakonda	09.05.2022-13.05.2022
Maheswari S	Applications of Artificial Intelligence in Brain-Computer Interface	SR University, Hanumakonda	09.05.2022-13.05.2022
Sudha S	ICT Tools for Effective Teaching and Learning	Kamla Nehru Mahavidyalaya, Nagpur	23.05.2022-28.05.2022
Indhumathi R	ICT Tools for Effective Teaching and Learning	Kamla Nehru Mahavidyalaya, Nagpur	23.05.2022-28.05.2022
Rajalakshmi J	ICT Tools for Effective Teaching and Learning	Kamla Nehru Mahavidyalaya, Nagpur	23.05.2022-28.05.2022
Loganathan V	ICT Tools for Effective Teaching and Learning	Kamla Nehru Mahavidyalaya, Nagpur	23.05.2022-28.05.2022
Rajalakshmi J	Recent Advancements and Applications of Data Science	Paavai Engineering College	27.06.2022 - 02.07.2022
Maheswari S	Recent Advancements and Applications of Data Science	Paavai Engineering College	27.06.2022 - 02.07.2022

## WORKSHOP

Ms.M.Ponkarthika has completed 30 Days Master class on Python Programming at Pantech e-Learning Pvt. Ltd., Chennai from 28.02.2022 to 29.03.2022.

## CSIR SPONSORED NATIONAL SEMINAR

Name of the staff	Topic	Program details	
		Organiser	Date
Sudha S	Nanomaterials for Bioimplants	Dr. N.G. P. Institute of Technology ,Coimbatore	01.02.2022
Yamuna Devi S	Nanomaterials for Bioimplants	Dr. N.G. P. Institute of Technology ,Coimbatore	01.02.2022
Govindaraj S	Nanomaterials for Bioimplants	Dr. N.G. P. Institute of Technology ,Coimbatore	01.02.2022
Ponkarthika M	Nanomaterials for Bioimplants	Dr. N.G. P. Institute of Technology ,Coimbatore	01.02.2022
Saravanakumar R	Nanomaterials for Bioimplants	Dr. N.G. P. Institute of Technology ,Coimbatore	01.02.2022
Maheswari S	Nanomaterials for Bioimplants	Dr. N.G. P. Institute of Technology ,Coimbatore	01.02.2022
SasiPreetha D	Nanomaterials for Bioimplants	Dr. N.G. P. Institute of Technology ,Coimbatore	01.02.2022

## STUDENT'S ACTIVITIES

### TNSCST PROJECT GRANT

Dr.S.Mangai , M.Ramganeswaran, R.Madhav, R.Santhosh kumar and Rahul Rajeev have received a TNSCST student project scheme for ₹ 7500 for the project titled '911 services and vital sign measurement utilizing mobile phone sensors and applications' for the academic year 2021-22.

### AWARDS

B.Amruthavarshini (II BME) won Ms.RYLA Award; P.Deepashri (II BME) received Outstanding Performance Award in Zonal RYLA at Bharathidasan College of Arts and Science from 19.03.2022 to 20.03.2022.

### PRIZE WINNERS

Name of the Student	Class	Date	Event	Prize Won / Participated	Place
Bala Subramanian G	II BME	25.03.2022	PAPER PRESENTATION	3 <sup>D</sup> PRIZE	KPR Institute of Engineering and Technology, Chennai
Abinesh K	II BME	25.03.2022	PAPER PRESENTATION	3 <sup>D</sup> PRIZE	KPR Institute of Engineering and Technology, Chennai
Naveen Kumar G	II BME	25.03.2022	PAPER PRESENTATION	1 <sup>ST</sup> PRIZE	KPR Institute of Engineering and Technology, Chennai
Kishore R	II BME	25.03.2022	PAPER PRESENTATION	1 <sup>ST</sup> PRIZE	KPR Institute of Engineering and Technology, Chennai

III BME		07.04.2022	OVERALL RUNNER UP		M.Kumarasamy College of Engineering,Karur
Nivash T R	III BME	07.04.2022	PAPER PRESENTATION	1 <sup>ST</sup> PRIZE	M.Kumarasamy College of Engineering,Karur
Riswanth S	III BME	07.04.2022	PAPER PRESENTATION	1 <sup>ST</sup> PRIZE	M.Kumarasamy College of Engineering,Karur
Neshaa Thevi A M	III BME	07.04.2022	PAPER PRESENTATION	1 <sup>ST</sup> PRIZE	M.Kumarasamy College of Engineering,Karur
Supriya A	III BME	07.04.2022	PAPER PRESENTATION	2 <sup>ND</sup> PRIZE	M.Kumarasamy College of Engineering,Karur
Vishnu M K	III BME	07.04.2022	PAPER PRESENTATION	2 <sup>ND</sup> PRIZE	M.Kumarasamy College of Engineering,Karur
Yeswanth B	III BME	07.04.2022	PAPER PRESENTATION	2 <sup>ND</sup> PRIZE	M.Kumarasamy College of Engineering,Karur
Sowmya S	II BME	13.04.2022	FLICKER	3 <sup>D</sup> PRIZE	Kongu Engineering College,Erode
Baladhinesh M	II BME	22.04.2022	VOICE-OVER	2 <sup>ND</sup> PRIZE	Erode Sengunthar College of Engineering,Erode
Bhuvaneshwaran A	II BME	22.04.2022	VOICE-OVER	2 <sup>ND</sup> PRIZE	Erode Sengunthar College of Engineering,Erode
Girubhadharan D	II BME	22.04.2022	VOICE-OVER	2 <sup>ND</sup> PRIZE	Erode Sengunthar College of Engineering,Erode
Lakshman Pranav S	II BME	22.04.2022	VOICE-OVER	2 <sup>ND</sup> PRIZE	Erode Sengunthar College of Engineering,Erode
Mohammed Azarudeen M	III BME	20.05.2022	KABBADI	2 <sup>ND</sup> PRIZE	VCET,Erode

### CONFERENCES ATTENDED IN INTER INSTITUTES

**C.Kiruthika, R.Sindhu, S.Thavamani, M.Vishva Udhaya** presented a paper titled 'Detection of Ovarian Cancer based on Segmentation using MATLAB' in CSIR Sponsored National Conference on Point of Care Technology: The Next Frontier in Personalized Medical and Health Care from 21.04.2022 to 22.04.2022 at Dr.N.G.P. Institute of Technology, Coimbatore.

**Abin Santhosh, Amal K Babu, Bejoin Aji Mathew** presented a paper titled 'Smart Ear Aid System for Deaf People in Public Area' in CSIR Sponsored National Conference on Point of Care Technology: The Next Frontier in Personalized Medical and Health Care from 21.04.2022 to 22.04.2022 at Dr.N.G.P. Institute of Technology, Coimbatore.

**C.Malavika, M.Mohanapriya, S.Preethi (IV BME B)** presented a paper titled 'Diagnosis and Detection of Skin cancer using Deep Learning' in CSIR Sponsored National Conference on Point of Care Technology: The Next Frontier in Personalized Medical and Health Care from 21.04.2022 to 22.04.2022 at Dr.N.G.P. Institute of Technology, Coimbatore.

### PAPER PRESENTATION

Name of the Student	Class	Date	Event	Prize Won / Participated	Place
Tarunyasree B Suba shree P Nazeeha M S	III BME	07.04.2022	Paper Presentation	Participated	M.Kumarasamy College of Engineering,Karur

Madhumitha Y Madhubala E	III BME	13.04.2022	Paper Presentation	Participated	Kongu Engineering College,Erode
Yeswanth S Sowbarnika Sri A P Keerthana A Christina Jenifer F Sobhika T Subiksha A	II BME	13.04.2022	Paper Presentation	Participated	Kongu Engineering College,Erode
Sneha R Sangeetha T Muthu Yogesh B	III BME	07.04.2022	Paper Presentation	Participated	M.Kumarasamy College of Engineering,Karur
Nivedha T Pavithra shree K	III BME	07.04.2022	Paper Presentation	Participated	M.Kumarasamy College of Engineering,Karur
Sowshiga K R	II BME	07.04.2022	Paper Presentation	Participated	M.Kumarasamy College of Engineering,Karur
Subhapriya S Sowmiya S Vanathi S	II BME	22.04.2022	Paper Presentation	Participated	Erode Sengunthar Engineering College, Erode
Durai murugan P	II BME	28.04.2022	Workshop	Participated	KSR College of Technology, Namakkal
Arsha V Naveen Kumar G	III BME II BME	01.04.2022	Paper Presentation	Participated	Kongu Engineering College,Erode
Frasana Beegam S Leela P	III BME	27.05.2022 – 28.05.2022	Paper Presentation	Participated	KSR College of Technology, Namakkal
Amruthavarshini B	II BME	27.05.2022 – 28.05.2022	Online Workshop	Participated	Dr.Mahalingam College of Engineering and Technology, Pollachi
Mahesh kumar M	III BME	26.05.2022 – 27.05.2022	Workshop	Participated	SNS College of Technology, Coimbatore
Hemamalini P Janani G K	III BME	25.05.2022	Paper Presentation	Participated	Sri Ramakrishna Institute of Technology, Coimbatore
Sobia M	III BME	27.05.2022 – 28.05.2022	Paper Presentation	Participated	KSR College of Technology, Namakkal
Durai murugan P	II BME	05.05.2022	Workshop	Participated	Sona College of Technology, Salem
Naveen kumar G	II BME	20.05.2022	Table Tennis Carrom	Participated	VCET,Erode

### INTERNSHIP CUM INPLANT TRAINING

NAME OF THE STUDENT	YEAR OF STUDY	DURATION	NO OF DAYS ATTENDED	PLACE OF INTERN
ANNAPOORANI K	III BME	21.03.2022 - 23.04.2022	30	ATHEENAPANDIAN PVT LTD
GEETHA M	III BME	21.03.2022 - 23.04.2022	30	ATHEENAPANDIAN PVT LTD
NAVEEN L	IV BME	03.03.2022 - 21.05.2022	80	APPASAMY ASSOCIATES (P) LTD
ANJANA T	IV BME	01.03.2022 - 25.05.2022	86	EMGLITZ TECHNOLOGIES
KAMALI AISHWARYA M	IV BME	01.03.2022 - 25.05.2022	86	EMGLITZ TECHNOLOGIES
BABY SHALINI J	IV BME	01.03.2022 - 25.05.2022	86	EMGLITZ TECHNOLOGIES



ASWATH C	IV BME	01.03.2022 - 25.05.2022	86	EMGLITZ TECHNOLOGIES
PEACHI PRIYA G	IV BME	28.02.2022 - 29.03.2022	30	PANTECH SOLUTIONS
AARTHI S	IV BME	23.02.2022 - 30.04.2022	67	SD PRO SOLUTIONS PVT LTD
KAVITHA S	IV BME	23.02.2022 - 30.04.2022	67	SD PRO SOLUTIONS PVT LTD
BABITHA M	IV BME	23.02.2022 - 30.04.2022	67	SD PRO SOLUTIONS PVT LTD
KARTHIKA K	IV BME	23.02.2022 - 30.04.2022	67	SD PRO SOLUTIONS PVT LTD
NITHESH KUMAR S	IV BME	21.02.2022 - 27.05.2022	96	ZIFO TECHNOLOGIES PVT LTD
GOKULA KRISHNAN	IV BME	21.02.2022 - 27.05.2022	96	ZIFO TECHNOLOGIES PVT LTD
GOWTHAM PRASATH E	IV BME	17.02.2022 - 25.05.2022	98	COGNIZANT ACADEMY
LINGESHWARAN T	IV BME	17.02.2022 - 25.05.2022	98	COGNIZANT ACADEMY
ROHITH P	IV BME	17.02.2022 - 25.05.2022	98	COGNIZANT ACADEMY
SANGEETHA S	IV BME	15.02.2022 - 30.05.2022	106	DXC TECHNOLOGY
SHIMRIN SULTHANA.J	IV BME	15.02.2022 - 30.05.2022	106	DXC TECHNOLOGY
SHANMUGAPRIYA M	IV BME	15.02.2022 - 30.05.2022	106	DXC TECHNOLOGY
PAVITHRA R	IV BME	15.02.2022 - 30.05.2022	106	DXC TECHNOLOGY

## PROJECT PRESENTATION

Name of the Student	Class	Date	Title of the Paper/ -pic	Prize Won / Participated	Place
MOHANAKRISHNAN.D SARVESH KUMARAN.M NAVEEN.P SUJITHRA.M.V	IV BME	07.05.2022	IOT ENABLED PORTABLE PHO-THERPY UNIT WITH NON INVASIVE BILIRUBIN MEASUREMENT	<b>1<sup>ST</sup> PRIZE</b>	VCET, ERODE
NITHISH S, PRADEEP S ROHITH KANNA S SURENDHAR C	IV BME	07.05.2022	PORTABLE VENTILA-R USING ARDUINO MICRO CONTROLLER	<b>2<sup>ND</sup> PRIZE</b>	VCET, ERODE
MANIBHARATHI M MUKILAN R,SHANMUGAVEL S THAYANANTHAN S	IV BME	07.05.2022	SMART MULTIPLE ATTENDANCE SYSTEM THROUGH SINGLE IMAGE	<b>3<sup>D</sup> PRIZE</b>	VCET, ERODE
TARUNYASREE B RISWANTH S, PAVITHRAA G NAZEEHA M S	IV BME	07.05.2022	THE SYRINGE PUMP BASED ON NANO	PARTICIPATED	VCET, ERODE
MUTHU YOGESH .B PRASITHA L, SNEHA R SANGEETHA T	IV BME	07.05.2022	INVESTIGATION OF PULMONARY DISEASE USING MACHINE LEARNING	PARTICIPATED	VCET, ERODE

NESHAA THEVI A M NIVASH T R, SUPRIYA A	IV BME	07.05.2022	IOT BASED MONI-RING OF FOOT PRESSURE	PARTICIPATED	VCET, ERODE
NIVEDHA T MUMRITHA C	IV BME	07.05.2022	HEALTH MONI-RING SYSTEM USING ATMEGA328P MICROCONTROLLER	PARTICIPATED	VCET, ERODE
YESWANTH B, VISHNU M K SUBA SHREE P PAVITHRASHREE K	IV BME	07.05.2022	ESP8266 BASED PATIENT HEALTH MONI-RING SYSTEM	PARTICIPATED	VCET, ERODE
S NESEKA N PRADHOSHINI V PRIYA	IV BME	07.05.2022	DESIGNING A MULTIFUNCTIONAL INCUBC-R FOR RURUAL AREA	PARTICIPATED	VCET, ERODE
SOBIA M , SOWMIYA K YAMUNA R	IV BME	07.05.2022	MUSCULAR BIO STIMULA- R	PARTICIPATED	VCET, ERODE
RAMYASRI K , ROSHINI K SANGAVI S, SNEGA R	IV BME	07.05.2022	ECONOMIC FRIENDLY HOME MONI-RING SYSTEM	PARTICIPATED	VCET, ERODE
S SRI ABIRAMI, M VIDHYA S NISHA , K SOWMIYA	IV BME	07.05.2022	CUFFLESS BLOOD PRESSURE MEASUREMENT	PARTICIPATED	VCET, ERODE
V RAMANI , S SUVETHA N THARANI A S THARSHINI SRI	IV BME	07.05.2022	THIRD EYE FOR THE BLIND	PARTICIPATED	VCET, ERODE
P RANJITHKUMAR R SATHIYAMOORTHY M TAMILSELVAN E.P. THIRUVENGADAM	IV BME	07.05.2022	KIDNEY S-NE DETECTION USING MATLAB	PARTICIPATED	VCET, ERODE
DILIP D DHARSHAN M ABINESH K	IV BME	07.05.2022	PASSWORD BASED CIRCUIT BREAKER	PARTICIPATED	VCET, ERODE
CATHERINE BIJU BOOMIKA C, DEEPIKA S	IV BME	07.05.2022	AU-MATED PARALYSIS PATIENT HEALTH CARE	PARTICIPATED	VCET, ERODE
AGALYA S, DIVYA M CHANDRALEKHA A DISHA MAHZOOZA	IV BME	07.05.2022	HAND TALK ASSISTIVE TECHNOLOGY FOR DEAF AND DUMB	PARTICIPATED	VCET, ERODE
KAMALA KANNA G.R KAVIN RAJ S.A MOHAMMED AZARUDEEN A	IV BME	07.05.2022	SMART PILL DISPENSER	PARTICIPATED	VCET, ERODE
E. MANIMEGALAI Y. MADHUMITHA E. MADHUBALA	IV BME	07.05.2022	SOUND ELECTRO ECG	PARTICIPATED	VCET, ERODE
P. HEMAMALINI G.K. JANANI , P.LEELA	IV BME	07.05.2022	AU-MATIC HAND SANTIZIER USING ARDUINO	PARTICIPATED	VCET, ERODE
GOWTHAM P GOWTHAM P KANNATHASAN S	IV BME	07.05.2022	AU-MATIC ANESTHESIA CONTROL SYSTEM USING ARDUINO	PARTICIPATED	VCET, ERODE
ARSHA V, DHARANYA T  DURGESWARI B	IV BME	07.05.2022	ANTISLEEP ALARM DEVICE FOR DRIVERS	PARTICIPATED	VCET, ERODE
JAYA VIVEKA B, LEKHA C JENIFER SWATHI R	IV BME	07.05.2022	ECG DISPLAY USING PULSE SENSOR	PARTICIPATED	VCET, ERODE
KAMALI A MADHIVADHANI C MADHUMITHA S	IV BME	07.05.2022	VOICE CONTROLLED WHEELCHAIR	PARTICIPATED	VCET, ERODE

AJITH KUMAR V ABHISHEK K.B BALA SUBRAMANIAN G	IV BME	07.05.2022	INTRAVENOUS DRIP MONI- RING SYSTEM	PARTICIPATED	VCET, ERODE
ABINAYA K, GEETHA M ANNAPOORANI K	IV BME	07.05.2022	PLANTAR NEUROPATHY	PARTICIPATED	VCET, ERODE
MAHESH KUMAR M MOHAMMED FASEEM R	IV BME	07.05.2022	SIMPLE COVID TRACKER USING NODE MCU	PARTICIPATED	VCET, ERODE
DIVYA K, GAYATHRI S FARSANA BEEGAM S	IV BME	07.05.2022	RECORDING AND ANALYSIS OF ECG USING LABVIEW	PARTICIPATED	VCET, ERODE
G. NAVEENKUMAR A. KEERTHANA, S. ARPUTHA B. AMRUTHAVARSHINI	IV BME	07.05.2022	PYRO CONROLLER USING OP-AMP	PARTICIPATED	VCET, ERODE
HRITHIKA NIVEHTA S.B	IV BME	07.05.2022	LIFE THROB IN LCD DISPLAYING USING PIEZOELECTRIC SENSOR	PARTICIPATED	VCET, ERODE
POOVARASAN.I SABHARI GANESAN T.S SUJAN.S.M, SOWMIYA.S	IV BME	07.05.2022	AIRFLOW DETEC-R	PARTICIPATED	VCET, ERODE
S.KAVYA, SWETHA.D HEMANANDHINI.J JANAPRIYA.M	IV BME	07.05.2022	WATER LEVEL INDICA-R	PARTICIPATED	VCET, ERODE
DHARSHINI.C, NEGA.R BHAVADHARANI.B FARHAASABRIN.F	IV BME	07.05.2022	-UCH SENSOR	PARTICIPATED	VCET, ERODE
NANDHITHA.R, NANDHINI.S HEMACHANDIRIKA.U DEVADHARSHNI.G	IV BME	07.05.2022	LASER SECURITY ALARM	PARTICIPATED	VCET, ERODE
MADHAV R RAHUL RAJEEV RAMGANESHWARAN M SANTHOSH KUMAR K	IV BME	07.05.2022	911 SERVICES AND VITAL SIGN MEASUREMENT UTILIZING MOBILE PHONE SENSORS AND APPLICATIONS	PARTICIPATED	VCET, ERODE
MONIKA B POOMANI SOUNDHARYA S POONGOTHA S MALAVIKA R	IV BME	07.05.2022	NON INVASIVE GLUCOSE ESTIMATION BASED IN INFRARED USING FINGER PLETHYSMOGRAPH	PARTICIPATED	VCET, ERODE
SUBHADHARANI S YASWANTHI K T YALINI A MENAGADEVI V	IV BME	07.05.2022	DESIGN AND IMPLEMENTATION OF HANDWRITING GUIDE FOR VISUALLY IMPAIRED	PARTICIPATED	VCET, ERODE
TAMILSELVI.R MALAVIKA.C MOHANAPRIYA.K PREETHI .S( 06-07-2000)	IV BME	07.05.2022	DETECTION OF CARDIOVASUCLAR DIEASE USING1-D CARDIOVASCULAR NEURAL NETWORK	PARTICIPATED	VCET, ERODE
DIVYABHARATHI S JASMIN N DIVINKUMAR S	IV BME	07.05.2022	IMPLEMENTATION OF BIOMETRIC AUTHENTICATION SYSTEM USING REDTAC-N TECHNOLOGY	PARTICIPATED	VCET, ERODE

**CONFERENCES ATTENDED**

<b><i>NAME OF THE PARTICIPANT</i></b>	<b><i>TITLE OF THE PAPER</i></b>	<b><i>NAME OF THE COLLEGE / INDUSTRY</i></b>
ABHIJITH JOY ALEN BABU EBIN SABU	DESIGN AND IMPLEMENTATION OF INTEGRATED E- VACCINATION CHIP ON COVID- 19	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
DEEPAK B GAWASKAR A JAYANTH R	KNEE IMPLANT MONI-RING	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
DEEPIKA K DHARSHINI S GAYATHRI M KARTHIKA S	AU-MATIC DIAGNOSIS SYSTEM FOR DETECTING MELANOMA USING HIS-PATHOLOGICAL IMAGES	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
ABIN SANTHOSH BEJOIN AJI MATHEW AMAL K BABU	SMART EAR AID SYSTEM FOR DEAF AND BLIND PEOPLE IN PUBLIC AREA	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
ESWAR T , ARUN T KEERTHANA R GAYATHRI G	GAIT ANALYSIS SYSTEM USING LABVIEW	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
HEMALATHA M BREEZY S , HARINI S ANUVARSHINI P	MONI-RING AND ALERT SYSTEM FOR PATIENT IV-BAG FLUID AND PARAMETERS USING IOT	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
AASHIYA SULTHANA M KAAVIYA A KAVIYA B , ELAKIYA K	CLASSIFICATION OF ENDOSCOPY IMAGES USING ARTIFICIAL INTELLIGENCE	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
ARAVINTH K GANESAN V KARTHIKEYAN S	MALARIA DETECTION USING MACHINE LEARNING	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
DHIVYABHARATHI S JASMIN N DIVIN KUMAR S	IMPLEMENTATION OF BIOMETRIC AUTHENTICATION SYSTEM USING REDTAC-N TECHNOLOGY	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
ABINAYA R KAVIPRIYA M N KAVIYA R, ANU M	VISUAL CRY-GRAPHY FOR BIOMETRIC PRIVACY	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
BABITHA M KARTHIKA K AARTHI S (23/07/2001) KAVITHA S	COVID -19 DETECTION AND CLASSIFICATION USING DEEP RESIDUAL NEURAL NETWORKS	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
JAMUNA P GANGA DEVI M AARTHY S (21/10/2000) KAVIBALAN K	BRAIN TUMOR DIAGNOSIS USING NOVEL IMAGE PROCESSING APPROACH	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE

KEERTHANA V LAVANYA P PREETHE P DHIVYA G	COPD AND PNEUMONIA IDENTIFICATION AND CLASSIFICATION OF CHEST X-RAY AND SPIROGRAM USING DEEP LEARNING	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
MADHAV R RAHUL RAJEEV RAMGANESHWARAN M SANTHOSH KUMAR K	911 SERVICES AND VITAL SIGN MEASUREMENT UTILIZING MOBILE PHONE SENSORS AND APPLICATIONS	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
MUKILAN R MANIBHARATHI M SHANMUGAVEL S THAYANANTHAN S	SMART MULTIPLE ATTENDANCE SYSTEM THROUGH SINGLE IMAGE	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
MONIKA B POOMANI SOUNDHARYA S POONGOTHAI S MALAVIKA R	NON-INVASIVE GLUCOSE ESTIMATION BASED ON INFRARED USING FINGER PLETHYSMOGRAPH	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
NITHISH S , PRADEEP S ROHITH KANNA S SURENDHAR C	PORTABLE VENTILATOR USING ARDUINO MICROCONTROLLER	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
KIRUTHIKA C SINDHU R THAVAMANI S VISHVAUDHAYA M	DETECTION OF OVARIAN CANCER BASED ON SEGMENTATION USING MATLAB	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
SUBHADHARANI S YASWANTHI K T YALINI A MENAGADEVI V	DESIGN AND IMPLEMENTATION OF HANDWRITING GUIDE FOR VISUALLY IMPAIRED	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
TAMIL SELVI R PEACHI PRIYA G PRIYANKA K	DETECTION OF CARDIOVASCULAR DISEASE USING 1-D CONVOLUTION NEURAL NETWORK	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
MALAVIKA C MOHANAPRIYA K PREETHI S (06/07/2000)	DIAGNOSIS AND DETECTION OF SKIN CANCER USING DEEP LEARNING	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
MOHANAKRISHNAN D SARVESH KUMARAN M NAVEEN P SUJITHRA M V	IOT ENABLED PORTABLE PHO- TOTHERAPY UNIT WITH NON – INVASIVE BILIRUBIN MEASUREMENT	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
NIJANA A, NAVEEN L RUSHIKAA S STEPHY BESILY R	MEDICAL ASSIST ROBOT FOR ISOLATED WARD PATIENTS IN HOSPITAL	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE
PRAVEENA R PREETHI S (05/10/2000) REKHA J SANDHIYA S	DEVELOP AN ALGORITHM - DETECT MUCORMYCOSIS (BLACK FUNGUS) DISEASE USING CNN	VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY, ERODE

### Med-Tech Eureka: The Body Is the Best Secure Data Channel

Pacemakers, implantable insulin pumps, neural implants, and other in vivo medical devices all need a way to send their data to the outside world. But ways to do that wirelessly, which would be more comfortable for patients, lend themselves to security risks, biocompatibility issues, and high power consumption. Researchers have now tapped into the charge stored by the body's natural ions to transmit low-power wireless data from bio-implants. "The body has an abundance of ions, and we are able to show you can establish long distance and very low power communication," says Dion Khodagholy, an electrical engineering professor at Columbia University.

Radio-frequency communication is the "go-to option" for wireless data transfer from implantable electronics today, he says. The antennas and other RF circuit components that send signals outside the body are made with rigid materials that don't conform to body tissue. The RF waves also get reflected and absorbed in body tissue, thus weakening the signal, which limits how deep an implant can be in the body and still communicate effectively. Plus, RF communication poses a security risk: The antennas continuously transmit data, making it possible for anyone nearby to snoop on the signals or hack them.



The new ion-communication method should allow implants to send signals securely through body tissue using low power, Khodagholy says. The simple system, reported in *Science Advances*, consists of two identical ultrathin, conformable electrodes made of gold foil on a conductive polymer that are placed inside the body. These electrodes serve as the transmitter, while a second set of identical electrodes attached to the skin serve as the receivers.

When the researchers create an alternating electric potential difference between the transmitter electrodes, the resulting movement of the charged ions changes the potential energy stored in the body. This change in turn causes a change in the voltage across the receiver electrodes, allowing them to read the transmitted signal. The researchers were able to use the system to send and decode digital signals at a frequency of 6 megahertz. The team tested electrodes of different sizes, changed the spacing between them, and changed the distance between the transmitter and receiver electrodes. Bigger electrodes could communicate through simulated tissue models over distances that were comparable to the heart and visceral organs.

As a demonstration, the team created a fully implantable neural interface for rats. They connected a commercial implantable brain electrode to the ionic-communication transmitter electrodes, which they implanted in the rats' necks. The implanted device transmitted brain signals via ionic communication as the rats ran around freely for three weeks, without any degradation in signal quality. Because of the signal transmission through ions in the body tissue, the technique needs lower voltages, and hence less power, than RF devices. "Our battery is six times smaller compared to RF transmitters," Khodagholy says. "We're hoping to push it even smaller."

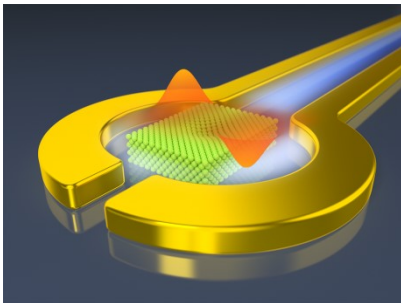
There is no security risk, since there are no unencrypted electromagnetic waves sent out into the air to be hacked. "With RF you're continuously transmitting data waiting for the receiver to catch the signal," Khodagholy

says. "Ionic communication is a lot safer because it needs physical contact - extract data. Also, it doesn't send an analog signal. It's fully digital information, which can be encrypted."

**S.PREETHI**  
**IV BME B**

## **Frozen Neon Invention Jolts Quantum Computer Race**

Quantum computers can theoretically find the answers - problems no classical computer could ever solve, but they rely on infamously unstable components known as qubits. New findings now suggests that electrons trapped on frozen solid neon could prove a simple yet powerful kind of qubit for use in future quantum computers. Qubits, or quantum bits, rely on the bizarre nature of quantum physics, which suggests that electrons, atoms and other building blocks of the universe can exist in a state known as superposition where they are essentially spin in two opposite directions at once or exist in two or more places at the same time. By placing many qubits in superposition, a quantum computer can in theory perform a mind-boggling number of computations simultaneously. Amazon, Google, IBM, and many others are racing - create a practical quantum computer from a variety of qubit platforms, such as superconducting loops, electromagnetically trapped ions and spins within silicon.



However, all qubits are extraordinarily fragile - outside interference. In the new study, - create a qubit protected from environmental disruptions, the scientists experimented with neon, a noble gas like helium that virtually never reacts with other elements, potentially making it an ideal host for a qubit. Neon freezes in a solid when cooled - below roughly minus 248.6 degrees C and brought - pressures of more than 0.42 atmospheres.

"The noble-gas solids are the most inert and purest solids in nature and can solve a lot of issues that other systems have," says study principal investigator Dafei Jin, a quantum physicist at Argonne National Laboratory in Lemont, Illinois. The researchers chose one of the simplest possible qubits for their design—single electrons. They froze neon at a temperature one-hundredth of a degree above absolute zero on a microchip and then used a tiny light bulb filament - spray electrons at it.

"When you bring the electron near the surface of the neon, the electrons in the neon atoms get slightly rearranged and repelled by the electron, because like charges repel, but because the neon is neutral, this slight repulsion of electrons leaves a slightly positive charge that attracts the electron - the surface," says study co-senior author Kater Murch, a quantum physicist at Washington University in St. Louis.

However, this electron cannot penetrate the surface of the neon, since all of the neon's electrons' energy levels are filled, "so it is repelled from actually contacting the surface." Instead, this electron stays on top of the neon. Electrodes in the microchip can keep electrons that get trapped on the solid neon in place for more than two months. A superconducting microwave resonator on the chip, much like a microscopic version of a microwave oven, then emits microwaves - help control and read the qubit.

The scientists argue that useful qubits require three key qualities:

- They can show long coherence—that is, stay in superposition for long stretches of time—ideally more than a second.

- They can quickly change from one state - another - help perform operations rapidly, ideally roughly a billionth of a second.
- They can scale up - link with many other qubits via a quantum mechanical phenomenon known as entanglement so they can work in parallel -gether.

The group's experiments reveal that within optimization, the new qubit can already stay in superposition for 220 nanoseconds and change state in only a few nanoseconds, which outperform qubits based on electric charge that scientists have worked on for 20 years."This is a completely new qubit platform," Jin says. "It adds itself - the existing qubit family and has big potential - be improved and - compete with currently well-known qubits."

The researchers suggest that by developing qubits based on an electron's spin instead of its charge, they could develop qubits with coherence times exceeding one second. They add the relative simplicity of the device may lend itself - easy manufacture at low cost.The new qubit resembles previous work creating qubits from electrons on liquid helium. However, the researchers note frozen neon is far more rigid than liquid helium, which suppresses surface vibrations that can disrupt the qubits.It remains uncertain how scalable this new system is—whether it can incorporate hundreds, thousands or millions of qubits. "I cannot say I have a clear answer," Jin says. "It is still a problem shared by all the qubit platforms. We may have some ways - do better than superconducting qubits, and close - as good as trapped ions. But it is not easy - achieve hundreds of qubits in the near term."

**S.AARTHY  
IV BME A**

### **Clearpath Announces TurtleBot 4**

-day, Clearpath Robotics is opening pre-orders for the newest, fanciest TurtleBot: the TurtleBot 4. Built on -p of iRobot's Create 3 in close partnership with Open Robotics, the TurtleBot 4 is "the next-generation of the world's most popular open-source robotics platform for education and research, offering superior computing power, more payload capacity, improved sensors, and a world class user experience at an affordable price." Couldn't have said it better myself, no matter how many times I've tried.



TurtleBot 4's big differentia-r is that it's designed - showcase ROS 2, the powerful open source Robotic Operating System that is working hard - successfully transition from robotics research in- an all-purpose framework that can safely and reliably power commercial robots as well. This is the first version of the TurtleBot - run ROS 2 from the ground up (including the Create 3 base), and offers an opportunity for anyone from precious middle schooler on up - learn ROS 2 in a safe and well supported way, on real hardware that is affordable(ish).

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There will be two versions of the TurtleBot 4 available for pre-order from Clearpath, starting today. Both versions use the iRobot Create 3 development platform (read more about that here) as a mobility base, with the same power and charging system including a base station. Both also include a 2D RPLIDAR-A1 sensor with a 0.15m - 12m range. Compute comes in the form of a Raspberry Pi 4B running Ubuntu 20.04 with ROS 2 already installed.

From there, the TurtleBot 4 Standard splits off from the TurtleBot 4 Lite. The Lite version misses out on some additional options for user accessible power, as well as useful interfaces including extra LEDs, some physical buttons, and a small OLED display that by default shows the robot's IP address (or whatever else you want). This is especially neat because it makes it easy to fire the robot up and launch a demo behavior without requiring an external computer. The other big difference is in the sensor: the Lite includes an OAK-D-Lite camera and stereo depth sensor, while the TurtleBot 4 Standard comes with a more capable OAK-D-Pro.

The cost of the TurtleBot 4 Lite is USD \$1,195, while the TurtleBot 4 Standard is USD \$1,850. Pre-orders will be available starting today through Clearpath distributors in North America, Europe, and Asia, and shipping will begin in July. This is certainly a premium over what you'd pay for all of the parts individually, and you can certainly build yourself a TurtleBot 4 mostly from scratch if you want to. But unless you have a specific interest in that process, there's a lot of value in getting a robot that is ready to go right out of the box. Using the Create 3 as a base gives the TurtleBot 4 both the ruggedness of a Roomba and a bunch of useful integrated sensors—the same ones that Roombas use to reliably navigate your house and not fall down your stairs. The Create 3's battery gives the TurtleBot 4 an impressive minimum battery life of 2.5 hours, and all of the parts are easy to fix or replace since you've got access to iRobot's supply chain. Top speed is nearly half a meter per second, or slightly slower if you don't disable the cliff sensors. If any of this doesn't satisfy your needs, part of the point of the TurtleBot platform is that it's super easy to expand, as long as you know what you're doing (or are willing to learn). Power and communications ports are easy to access, and the TurtleBot 4 has lots of easy ways to mount up to 9 kilograms of hardware.

**S.PRADHOSHINI**  
**III BME B**

### **IEEE's Plan - Help Combat Climate Change**

The IEEE Board of Directors formed an ad hoc committee on climate change in February to coordinate its response to the global threat. The Institute asked the committee's chair, 2022 IEEE President-Elect Saifur Rahman, about the issues it will be addressing, what role IEEE members can play, and other topics.

**Why was the ad hoc committee established?**

Its charter is - develop a cross-IEEE strategy - synchronize and guide the organization's response - changes in the global climate. The committee will be the face of IEEE on the global platform dealing with these issues.

IEEE has significant relevant expertise and ongoing efforts that can be brought - bear on this issue. The committee includes experts from all six IEEE organizational units and all 10 IEEE regions. I did this on purpose so that people will have some ownership over this problem. Efforts include the work done by societies such as the IEEE Power & Energy Society, - which I belong; conferences such as the IEEE Sustainable Power and Energy Conference; publications including IEEE Electrification; and technical standards, like IEEE 1547 for connecting distributed energy resources - the grid. This ad hoc committee will serve - better connect and coordinate these efforts.

### **Why should IEEE be involved in combating climate change?**

IEEE has a global footprint, with members in 160 countries. With this very broad footprint, we can help - bring -gether organizations working on various aspects of climate change and possible solutions. IEEE is here - listen - them. For example, organizations such as the Sierra Club and the World Wildlife Fund aspire - make the world carbon-neutral in 30 - 40 years. There's nothing wrong with their aspirations. We, as technologists, have a responsibility - point out - them the steps that need - be taken - get there and what the challenges are.

We are not a power company, a government, or a business that has a target - achieve, but a neutral platform. IEEE is highly respected because we don't have an agenda. As the world's largest organization of technical professionals, IEEE has both the opportunity and the responsibility - assist in organizing engineers, scientists, and technical professionals - address the causes, mitigate the impact, and adapt - climate change.

### **What is the committee working on?**

We are reaching out - the French Academy of Technologies, Rotary International, UNESCO, U.S. National Academy of Engineering, World Federation of Engineering Organizations, and several environmental organizations - collaborate with them. We are sharing each other's approaches - tackling the climate change problem, and IEEE is offering the services of its volunteer base - address some of these issues.

### **Why should members care about climate change? From a practical standpoint, what can they do?**

Climate change is an existential threat - humanity. It has the potential - change the way we live and threatens the livelihood of hundreds of millions of people including members. The concern about climate change is across all age groups.

IEEE has a responsibility - bring this threat - the attention of our members so that they can in turn educate business leaders, political leaders, and society about its impact and possible solutions.

For example, engineers and technologists can develop technologies and offer best practices for decarbonization. IEEE can also provide resources - its members so they can give talks - local schools about -pics such as coal-burning power plants or solar energy. We want - show that members can talk about climate-change -pics with people who are not engineers.

## What are technologies that you think can affect climate change?

When the ad hoc committee met for the first time in January, I identified what I call a six-point plan approach - show that IEEE is thinking about climate change seriously. The technologies are:

Energy efficiency. These include low-cost solutions such as using more efficient light bulbs and lowering the temperature of your air conditioner. If you use less electricity, you will burn less coal. It's as simple as that.

Battery energy storage. You cannot make wind and solar energy useful throughout the day unless you can store it.

Renewables such as solar, wind, and hydroelectricity. These have some challenges that need to be solved, such as integration into the grid.

Nuclear power. While large-scale nuclear power is still very unpopular, there are new technologies, such as advanced nuclear reactors and small reactors, that could be more acceptable and are not as risky as 1,000-megawatt big nuclear power plants, according to "Small Modular and Advanced Nuclear Reactors: A Reality Check," published in IEEE Access.

Cross-border power transfer. If countries want to be energy self-sufficient, they may end up putting together a lot of resources that are not very efficient. For example, it's cheaper for New York state to buy electricity from Canada than to build more power plants.

Carbon sequestration. Coal plants will be running for the next 30 - 40 years, so we must accept that. Our job as engineers is decarbonization, so we need to extract the CO2 released from power plants and hold it somewhere else. Coal-powered plants could also be more acceptable if we could extract soot from them.

Climate change and global warming are universal. You can talk about the topic at any level with anybody, from high school kids to life members. My mission for this ad hoc committee is to create a platform to give members the tools to do that.

**Y.MADHUMITHA**  
**III BME A**

## Should Right-to-Repair Laws Extend to Bionic Body Parts?

When IEEE Spectrum published an article in February about blind people whose bionic vision systems had become obsolete and unsupported, it generated both attention and outrage. The article tells the story of a company called Second Sight that created the world's first retinal implants for blind people, sold its Argus II device to some 350 people around the world, and then stopped making and supporting the implanted technology. When one user's Argus II system broke, he had to crowdsource spare parts to get it working again; other users have defunct technology in their eyes or are simply mourning the vision upgrades they were promised.

Coauthors Eliza Strickland and Mark Harris spoke about the article on numerous radio shows and podcasts, and one question kept coming up: Don't regulations exist to protect consumers from this kind of corporate behavior?

For consumer electronics, there's a lot of activity around right-to-repair laws: Europe's first such regulations took effect in 2021, requiring manufacturers to make parts available to third-party repair shops for

up - 10 years. In the United States, the Repair Organization is promoting laws at both the federal and state level. But this young movement has concerned itself only with consumer electronics, not the medical devices that are regulated by the U.S. Food and Drug Administration and similar agencies around the world. And, as Spectrum discovered, medical regula-rs aren't yet on the bandwagon.

### **A Possible Precedent**

“Medical devices are often a bit of a wild west,” says Robert Sparrow, a professor of philosophy at Australia's Monash University who often writes about the ethics of biotechnology and human augmentation. Sparrow wrote a paper about the his-ry of cardiac pacemakers and the lessons that can be learned from that his-ry, which stretches back some 60 years.

The paper explains that in the early days of commercial pacemakers, different company's brands didn't have compatible parts. This incompatibility became an issue when a patient went in for a routine replacement of the pulse-genera-r unit, a procedure that is less dangerous if surgeons don't have - remove the electrodes that snake in- the chambers of the heart. But if the surgeons were installing a new brand of pulse genera-r, they'd have - pull out the electrodes and put in new ones. This situation persisted until the 1980s, when the industry came up with voluntary standards.

The pacemaker example shows that poor outcomes for patients can drive policy changes, but Sparrow encourages researchers and clinicians working on -day's cutting-edge implants - anticipate possible problems during the R&D stage. He also thinks that clinicians should have forthright conversations with their patients about bionic body parts. “These devices won't be state of the art forever, and they may not work forever,” he says. “Clinicians should be required - discuss that in the initial consultation.”

Sparrow notes that the users of Second Sight's retinal implants had one big thing going against them: They were a very small cohort, without the buying power - create a market for spare parts. If retinal implants and other neurotechnologies take off, with more companies offering products - larger patient populations, future users may find themselves with more recourse.

### **The Situation -day**

Spectrum asked the FDA if regulations exist for long-term support of implanted devices, both in terms of hardware and associated software. In a written response, a spokesperson said that companies applying for approval of a device must submit assurances of safety, effectiveness, and “claims regarding the expected life of the device for which they seek approval.” The response also noted that the FDA moni-rs postmarket safety and effectiveness of devices with a manda-ry reporting system for device malfunctions and adverse events. And if a device manufacturer actually goes out of business and declares bankruptcy, “a court may impose requirements on the former owners of the firm - protect patients,” the response says, and “the FDA may also take steps - protect patients in these circumstances.”

However, if a company simply discontinues a device that patients rely on, it seems there's nothing for the regula-rs - do.It therefore comes down - the voluntary efforts of device makers themselves. One example is the company Cochlear Limited, a medical device company that implanted its first cochlear implant for severe hearing loss in Australia in 1982 and won the first FDA approval for such an implant in 1985. Cochlear implants are classified as a neurotechnology because the electrodes implanted in the inner ear

interface with the nerves; the implanted portion of the system remains in place permanently, while the sound processor that's worn externally is regularly upgraded. The company therefore has 40 years of experience with device obsolescence, support, and upgrades.

Scott Housley, vice president of marketing for Cochlear's North American division, says that "no regulations or voluntary standards exist for how long a piece of hardware or software should be supported," but that the company starts by offering a 10-year warranty on its implants and a 3-year warranty on its sound processors. As the company develops each next-gen sound processor, its engineers work - ensure that the new technology works with all of the old implants, which are often technologies "from a different era," he tells Spectrum.

Housley notes that 17,000 people around the world still have Cochlear's first-generation implant from the 1980s, and they can all use the very latest sound processor. "The first people - hear with a cochlear implant, 40 years ago, can now access direct smartphone connectivity through their original implant using our latest behind-the-ear sound processor," he says.

The other assurance the company offers - its cus-mers is that it's financially stable and making sound business decisions - ensure that it will be here for people who rely on its technology. "It's difficult, if not impossible, - legislate a company's long-term viability," Housley notes, so the ultimate responsibility is on the company.

## What Could Be Done

Rajesh Rao, codirec-r of the NSF Center for Neurotechnology at the University of Washing-n, says it's important - start thinking about full life cycle design of neural technologies.

"There's no guaranteed future-proofing technique I can imagine," he says. "But one potential strategy is, right from the very beginning, bringing a patient-centric rather than an engineering-centric point of view." A patient-centric design might involve eschewing unique, cus-mized components for ones that are modular or using industry-standard interfaces, thus allowing for easier upgrades.

The UW center has ethicists working alongside engineers. They ask questions and make suggestions in the patient's interest, even though deployment could lie years in the future. "The design process itself needs - be influenced by a philosophy of: How can we make sure that in the future this device does not become obsolete?" says Rao. Rao also notes that ethical guidelines for neurotech are being developed by the IEEE Brain group, although that effort is at a very early stage. "One of the issues is that the technology keeps changing," he says.

Rao is particularly excited—and concerned—about potential applications of AI technologies like machine learning - neural devices. In the future, he says, implants that decode or generate brain signals could use AI - personalize themselves - their owners, removing the need for regular clinical visits. "This kind of biomedical device would be a coadaptive system," he says. "The brain is adapting because the brain is an adaptive device, and the system may also in the future start - adapt in conjunction with the brain."

The FDA has just started - come - grips with AI within medical devices, in terms of ensuring their safety, effectiveness, and reliability. Rao believes that it should also be thinking about how these devices, and the companies behind them, might fail. "Right---repair laws, open sourcing, and so on become a lot more

complicated when you have intelligence built in- the device,” he says. Should a neurotech company get acquired, Rao says that there should be regulation ensuring that users who are dependent on its technology are not left hanging: “Patients should be part of the negotiation process for the acquisition of the IP or other assets of the company.” Another idea is for governments - require startups - place assets in a technology escrow—a safe repository if the company is unable - continue its own support.

But if the worst happens and an implantable device company runs out of money or enters bankruptcy, Rao warns that the fate of the Second Sight Argus II users could very well be repeated. “I don’t see an easy way of maintaining those systems,” he says. “Even open sourcing the technology may not be enough because there are going - be very specialized parts, in terms of both hardware and software.” Ultimately, people considering implanted devices will have - make their own decisions as - whether the potential benefits of the technologies outweigh the potential risks, medical and otherwise. And that suggests patients will have - spend as much time looking at a company’s reputation, track record, and balance sheet as they do at assessing its technology itself.

**S.JAGAN  
II BME A**

### **More Proof That Far-UV Lamps Could Curb Pandemics**

Ultraviolet light became an important -ol - fight the COVID-19 pandemic with virus-zapping UV robots plying hospitals and airports, and a plethora of personal UV gadgets - sanitize phones and keyboards. Those devices emit UV light at a wavelength of 254 nanometers, which destroys bacteria and viruses by wreaking havoc on their DNA or RNA. It can also penetrate human skin and eyes, causing skin cancer and cataracts.

Now researchers show that a type of shorter-wavelength UVC light, in the far-UV region, that is safe for people can kill 98 percent of microbes floating around in a room. As long as the lights were on, microbe levels remained low even as more were continually sprayed in- the room. The study, published in Scientific Reports, suggest that far-UVC lamps could be an effective way - fight the spread of viral diseases like COVID and influenza. Getting there, though, will require new light sources, regulations, and increasing public awareness that far-UV light is safe.

“If the technology had been well developed five years earlier and far-UVC lights had been widely installed, potentially the COVID crisis could’ve been unlike what it has turned out - be,” says David Brenner, director of Columbia University’s Center for Radiological Research, and an author of the paper. “We’ve really lacked the -ols - fight COVID. Masks, vaccination, and social distancing all involve people having - make decisions. Far-UVC is a passive device, it’s just up there in the ceiling.”

Humans have known for over a hundred years that UV radiation can kill deadly germs, and hospitals have used germicidal 254-nm UVC - sterilize objects for decades. But its harmful side effects on people mean the lamps can be turned on only when a room is empty, limiting effectiveness, Brenner says. “It’s not much use cleaning a room in the middle of the night, and then people walk in in the morning and start exhaling viruses in the air. You really need a way - clean the air in a room continually when people are around.”

This is where UV light with a shorter wavelength of 222 nm comes in. Its higher-energy light is strongly absorbed in the outer layers of human tissue. It does not get past the dead cells on the outer layer of skin or the tears that coat the eyes.

In 2020, Brenner and his team demonstrated that far-UVC light kills airborne coronaviruses. The study was done in a small chamber in the laboratory. For the new large-scale study, the researchers installed five commercial krypton chloride excimer far-UVC lamps in the ceiling of a ventilated room-sized enclosure. A mist of *Staphylococcus aureus* bacteria—which is slightly less sensitive to far-UVC than the coronavirus—was sprayed in on one side, while sensors measured their numbers at an air outlet on the other side.

Commercial far-UVC products came on the market right at the beginning of the pandemic, but “the availability of commercial products has outpaced the research,” says Ewan Eadie, a microbiologist at the University of Dundee school of medicine, in Scotland,” who led the latest research with Brenner. “Research needs to prove in what situation it works and how best to deploy it.”

What’s also needed are better sources for far-UVC light, says David Copithorne, vice president of marketing at startup NS Nanotech in Los Angeles, which is developing the world’s first solid-state source of far-UVC wavelengths. Krypton chloride excimer lamps, the only available source, “cost in the thousands of dollars, their lifetimes still are only several thousand hours, they run hot, they use caustic gases, and they are somewhat bulky.”

NS Nanotech’s far-UVC emitter based on a nitride semiconductor overcomes those issues, he says. The company is ramping up production and plans to ship its first product this year, intended for customers who want to purify their personal airspace in vehicles, offices, and airplanes.

Brenner and his colleagues’ groundbreaking work has put far-UVC in the spotlight, Copithorne adds. Regulatory bodies are now setting standards for its use in public spaces, and industry players are working hard to come up with appropriate ways to deploy far-UVC disinfection.

For Brenner, widespread use of far-UVC can’t come soon enough. Since the light is agnostic to the type of virus, and only cares about the genetic material inside, it should be able to kill any virus and its mutations effectively. “Widely installed far-UVC could maybe prevent the next pandemic or the next yearly influenza epidemic,” he says. “I would like to see it in all sorts of places where people get together and spend time—like offices, elevators, restaurants, bus stations, and airplanes.”

**K.RAMYA**  
**II BME B**

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