

ConnEEEct



**"Technology is
like a Mobius
strip, it can be a
tool for
liberation or a
path to
destruction"**

**SCAN TO
VISIT US**



2023





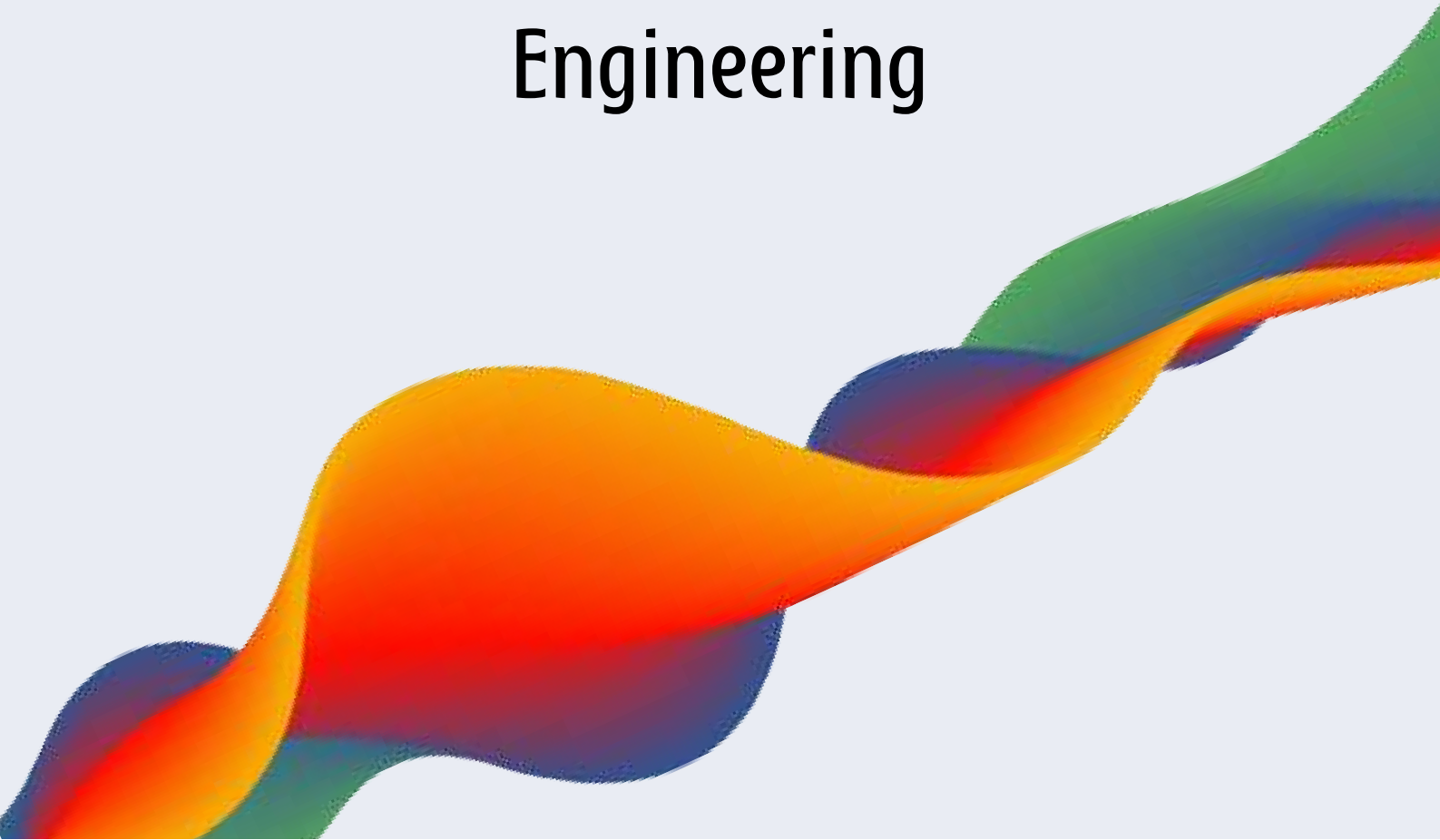
Veer Surendra Sai University of Technology, Burla

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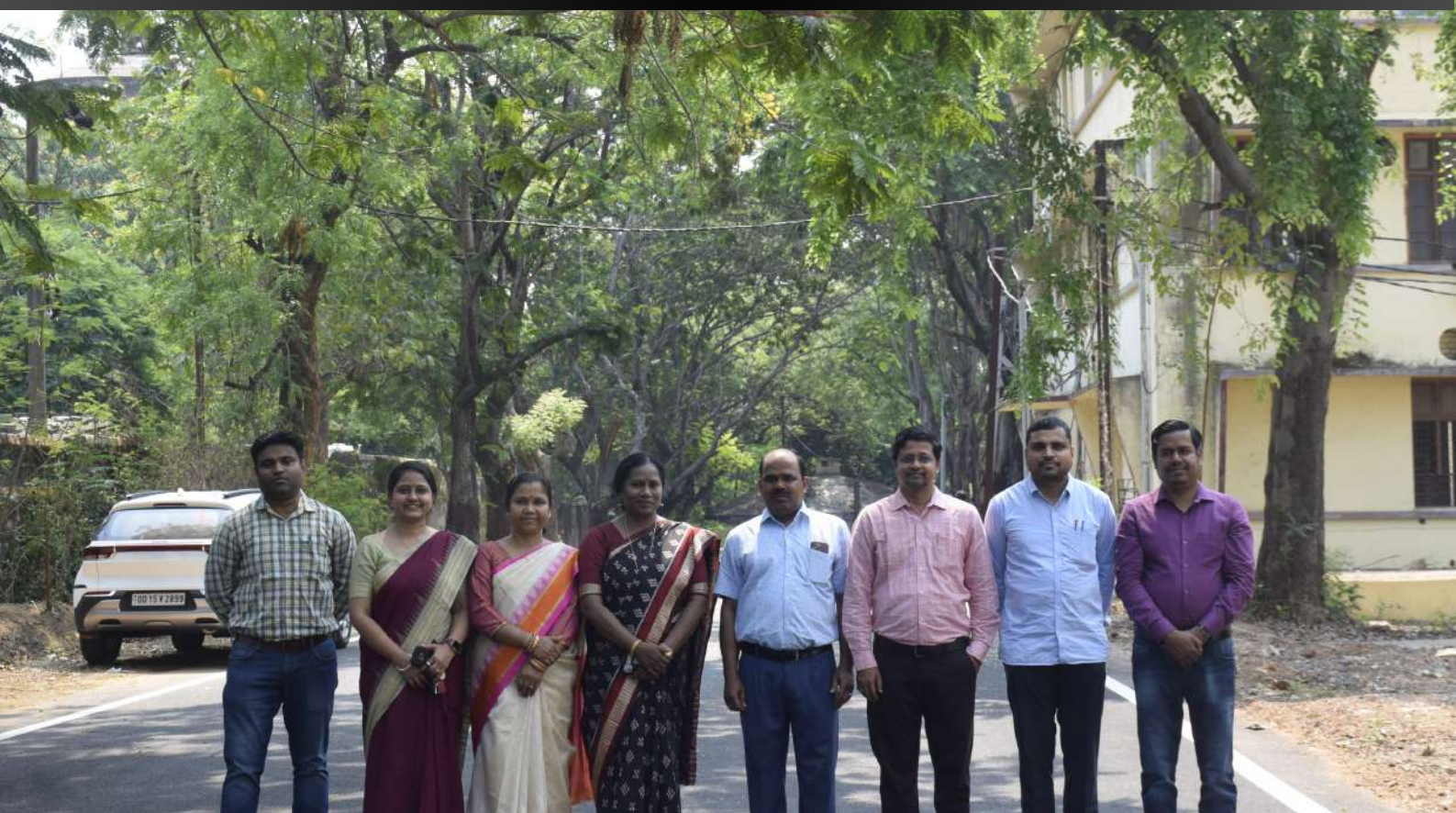


**The Annual Technical Magazine of the
Department
of**

**Electrical and Electronics
Engineering**



FACULTY MEMBERS 2K23



BATCH OF 2K22




Vice Chancellor's Message

Being part of a perfect happening is truly an unforgettable experience, and the branch technical symposium is no exception. The unity and integrity of the students who are organizing this spectacular event are simply inspiring, and it's clear that this year is already off to an incredible start, filled with energy and enthusiasm that's positively contagious. It is a celebration of the importance of the branch, and it's amazing to see how it's shining a light on the incredible events and activities that are happening within it.

Speaking of events, I can hardly contain my excitement for SPECTRUM, the fest organized by the student society of the Department of Electrical and Electronics Engineering. This tech-fest is going to be an absolute feast for the senses, a chance for young tech enthusiasts to indulge their passion for innovation and exploration, and to come away feeling refreshed and enlightened.

I am highly optimistic that the organizers of SPECTRUM will knock it out of the park, and I wish them all the very best as they put the finishing touches on this incredible event.



(Prof. B. Majhi)



**Prof. Banshidhar
Majhi**

Vice-Chancellor, VSSUT

HOD's Message

The Department of Electrical and Electronics Engineering is committed to provide our students with a great quality education that combines theory with practical knowledge. Our department is also actively engaged in research and innovation to find solutions to real-world problems.

I am immensely joyed to share with you about SPECTRUM which has taken its shape for the first time after EEE started functioning as a separate department. It shall provide a great platform to those technology enthusiasts who had something in their minds but did not have a proper platform to share it. I hope the event gets a huge success, all thanks to the efforts put in by the students, faculty members, and staff of the department.



(Dr. Shanti Behera)



Dr. Shanti Behera

**Head of Department,
Electrical and Electronics
Engineering**

Message of Dean, School of Electrical Sciences

I am enthusiastic to hear that the Electrical and Electronics Engineering (EEE) branch is organizing a branch technical symposium SPECTRUM for the first time as an independent society. This event will provide an excellent opportunity for the students to showcase their skills and talents while celebrating the spirit of collaboration and teamwork.

As the Dean of Electrical Sciences, I am proud of the hard work and dedication that is put into planning this event. I am confident that the efforts will result in an exciting and memorable occasion for everyone involved.

I encourage all EEE students to participate actively in this event, whether it's by showcasing your projects, presenting your research, or participating in fun and engaging activities. This is a chance to demonstrate the creativity, innovation, and passion that makes the branch stand out.

I wish all the best for a successful branch symposium. Let the events be truly unforgettable experiences.



(Dr. Sidhartha Panda)



**Dr. Sidhartha
Panda**

Dean, School of Electrical
Sciences

Message of Faculty Advisor

I am delighted to commence that our branch is set to organize a technical fest, which I am sure will be a huge success. As the faculty advisor for the event, I would like to extend my warmest congratulations to all those involved in its planning and execution.

Technical fests are a great way to showcase our talents and skills and I am confident that this event will provide an excellent opportunity for our EEE students to display their creative abilities, leadership skills, and teamwork. I encourage all the student members to participate actively in the event and make the most of this wonderful opportunity.

Finally, I would like to wish everyone involved in the event all the very best. Let this technical symposium SPECTRUM spread its colors from its inception and let's carry it forward and make our branch proud!



(Ms. Sarmila Garnaik)



**Dr. Sarmila
Garnaik**

Faculty Advisor ,
EEE Society

From the Editor's Desk

Being part of an exceptional journey is always the best thing one can experience. It has been my greatest privilege to be assigned as the chief editor of the annual technical magazine “ConnEEect SPECTRUM” of the Department of Electrical and Electronics Engineering.

The magazine shall shed light on the technical aspects that somehow remain furred and eventually exist but get obliterated from our minds. It is curated in a special manner such that every aspect binds the readers to it. The world today is advancing at an unimaginable pace. The magazine shall provide enough insights for anyone to know about technical happenings.

I would like to take this opportunity to extend my gratitude to all the members involved in the compilation of the magazine. Their determination, hard work, and positivity have resulted in the successful fulfillment of the task in a short period for the first time. No words of mine can match the immense level of passion the faculty members have shown throughout the process. I hope the magazine fulfills its purpose.



Sritam Sankalp

Editor-in-Chief,
Annual Technical Magazine
Electrical and Electronics
Engineering

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Teacher's Corner



**Prof. Rabindra
Kumar Sahu**

Professor Rabindra Kumar Sahu is a distinguished expert in the field of power system engineering. With over 20 years of experience, Professor Sahu has established himself as a leading authority in modeling, simulation, and analysis of power system operation and control, automatic generation control, FACTS devices, deregulation and restructured power systems, and the application of soft computing in electrical engineering. Professor Sahu is also a highly regarded teacher and has provided instruction to both graduate and postgraduate students. His guidance has resulted in 7 Ph.D. scholars receiving their degrees, with several achieving significant accomplishments including being listed among the top 2% of cited scientists by Stanford University and Elsevier in 2021 and 2022.

In addition to his academic achievements, Professor Sahu has also received numerous accolades and awards for his work, including being named a Fellow of the Institution of Engineers (India) in 2015 and receiving the Best Paper Award at the IEEE International Conference on Circuit, Power and Computing Technologies in 2013. He was also the Session Chair for the special session on "Power and Energy Systems" at the 4th International Conference on Computational Intelligence in Data Mining in 2017. Professor Sahu's contributions to the field of power system engineering have earned him a reputation as a highly respected and sought-after expert. His expertise is truly impressive and has made a significant impact in the field.



Dr. Gyan Ranjan Biswal

We are immensely prerogative to have Dr. Gyan Ranjan Biswal sir as our mentor for steering and enlightening our career in every. His hands-on approach to instructions is truly admirable because it allows us to connect theoretical ideas with real-world applications. His method of upskilling and commitment to dispense deets about the latest technologies makes learning exciting and more perceptive which helps us maintain a competitive advantage. We deeply value his realism because it inspires us to view the world's issues from new and useful perspectives.

Dr. Gyan Ranjan Biswal completed his B.Tech from Pt. RSU, Raipur after that he continued his quest for knowledge and completed his M.Tech from CSVTU, Bhilai, and then completed his Ph.D. from the Indian Institute of Technology, Roorkee. His passion for knowledge is incomparable. He has also done research in many areas that contributed to the well-being of society.

Some of his research areas include Power Generation and Sub-station Automation, Hydrogen Fuel Cell Backed hybrid energy systems, smart sensors, Internet of Things(IoT) and the list continues. The department feels honored to have him as a faculty member.



Dr. Santi Behera

Dr. Santi Behera is a distinguished professor and the Head of the Department of Electrical and Electronics Engineering at the Veer Surendra Sai University of Technology. She is a renowned authority on power systems and optimization techniques, having worked in academia for more than 22 years. Dr. Behera is devoted to providing chances for top-notch education and research as the department's head. She has created a fresh curriculum that takes into account the most recent developments in the area and utilized cutting-edge teaching strategies. She has published several research papers and has also been invited to speak at various conferences worldwide.

She has made significant contributions in the field of Voltage stability using intelligent techniques, Power quality, and Renewable energy sources. She is involved in community outreach projects that advance STEM education and has created policies and strategies that benefit students in the EEE department. Dr. Santi Behera is an experienced lecturer and a superb leader, to sum it up. Her commitment to diversity, education, and research has won her the respect and affection of everyone.



Ms. Sarmila Garnaik

Ms. Sarmila Garnaik is an esteemed teacher in the Department of Electrical and Electronics Engineering at VSS University of Technology, Burla, since August 2011. She is a teacher whom every student looks up to. She holds a B.Tech. degree in Electronics and Telecommunication Engineering from Utkal University and an M.Tech. degree in Communication System Engineering from VSS University of Technology.

Currently pursuing her Ph.D. in VLSI signal processing, her research interests include Digital Signal Processing, Speech Signal Processing, and Biomedical signal processing. She has published several research papers in various international journals.

In addition to her academic pursuits, Sarmila Garnaik is a certified "Yoga teacher and evaluator" by the Yoga Certification Board, Govt. of India, and a member of Rotary International. She is also known for her philanthropic ventures and environmental activism.

As a team player, she has contributed significantly to the development of the EEE department and the University in various positions. She is committed to the holistic development of the students and is highly regarded by her colleagues and students alike. It is an honor to have Sarmila Garnaik as a member of our faculty, and her contributions to the field of engineering are truly remarkable.



Dr. Lingraj Dora

Dr. Lingraj Dora is an exceptional teacher known for his exceptional teaching skills. His passion for the subject and ability to simplify complex concepts in a way that is easy to comprehend are truly inspiring. His teaching style has had a significant impact on our learning journey. His encouragement for class participation and creating a welcoming environment to make it easy for us to ask questions are the traits that everyone adores. We are grateful for his unwavering dedication to helping us achieve academic success, and we feel lucky to have had him as our teacher.

Dr. Lingraj Dora is a distinguished scholar with a remarkable academic background. He graduated from U.C.E, Burla, in 2006, with a Bachelor's degree in Electronics and Telecommunication Engineering. In pursuit of his passion for engineering, he then went on to complete his Master's degree in Communication System Engineering from VSSUT, Burla, in 2010. His educational journey culminated with a Doctor of Philosophy degree in Engineering, also from VSSUT, Burla, in 2019. He specializes in the fields of Medical Image Processing, Pattern Recognition, and Communication System Engineering. His expertise and dedication to his craft have led to numerous groundbreaking contributions in these areas. With his impressive qualifications and specialized knowledge, Dr. Lingraj Dora continues to be a valuable asset to his field of study.



Dr. Sasmita Behera

Dr. Sasmita Behera is an esteemed faculty member in the Electrical and Electronic Engineering (EEE) department at our university. She has over 9 years of industrial and 12 years of teaching experience, with a focus on power systems, renewable energy, and soft computing. With a Ph.D. in Electrical Engineering from VSSUT, She has published several research papers in prestigious journals and has been invited to speak at various conferences worldwide.

As a teacher, Dr. Sasmita Behera is known for her engaging lectures and hands-on approach to teaching. She inspires her students to pursue careers in the field and has played a key role in developing the EEE curriculum and securing funding for research projects. She has worked to create opportunities for underrepresented groups in the department and has helped to create a more welcoming and inclusive environment for all students. Dr. Sasmita Behera is a highly valuable asset to the EEE department and the university. Her contributions to research and teaching have made a significant impact in the field of electrical engineering, and her dedication to promoting diversity and inclusion has helped to create a better learning environment for all students.



Dr. Bibhuti Prasad Sahoo

A professor is a title given to a teacher or scholar who holds the highest academic rank in their field of expertise at a college or university. They play a crucial role in advancing knowledge and training the next generation of scholars. Dr. Bibhuti Prasad Sahoo is a highly experienced and friendly teacher specializing in Measurement and Instrumentation. He obtained his B.Tech degree in Electrical Engineering from NIT Rourkela in 2007, followed by an M.Tech in Measurement and Instrumentation from IIT Roorkee in 2011. He recently completed his Ph.D. in Electrical Engineering from VSSUT, Burla, in 2022.

He has more than ten years of expertise instructing undergraduate and postgraduate students in a variety of subjects, such as Power Electronics, Power System 2, Control System Engineering, Signals and Systems-1, and Control System Engineering 2. His research area focuses on the application of soft computing techniques for power system control. His works include load frequency control of power systems with a special focus on frequency regulation of renewable energy-based Microgrids. Additionally, he is a life member of the Odisha Bigyan Academy, an organization committed to promoting science education and research in the state of Odisha. Dr. Sahoo has taken on additional responsibilities at VSSUT as a member of the Training and Placement Council since May 2021 and NSS programme officer since September 2022 in addition to his usual teaching duties.



Mr. Prasanta Kumar Parida

Mr. Prasanta Kumar Parida is an esteemed faculty member of the Electrical and Electronics Engineering department with over 10 years of teaching experience at Veer Surendra Sai University Of Technology, Burla. He has completed his B. Tech in Electronics and Telecommunication Engineering in 2007 and M. Tech in Communication System Engineering in 2012 from VSSUT, Burla. Mr. Prasanta Kumar Parida brings a wealth of knowledge and enthusiasm to his classroom with great teaching skills in Digital Circuits and Design, Electromagnetics Theory, Control System Engineering, Digital Signal Processing, and Communication Systems. He not only challenges his students to think critically and creatively but also fosters a supportive learning environment where students feel encouraged to share their ideas and insights. Beyond the classroom, Mr. Prasanta Kumar Parida is involved in research with vast domains like image processing. We are proud to have Mr. Prasanta Kumar Parida as a faculty member of our department

Student Insights

UNLOCKING THE POTENTIAL OF METAVERSE

The Metaverse is a term that has been used to describe a virtual world where people can interact with each other in a virtual space. This space is created through the use of virtual reality (VR) technology and allows people to explore and interact with a digital environment [1]. The potential of the Metaverse is enormous, and it has the power to revolutionize the way we live and work.

One of the main benefits of the Metaverse is that it provides a new way for people to connect and collaborate with each other. This can be particularly beneficial for businesses, as it allows employees to work together in a virtual space, regardless of their physical location. This can lead to greater productivity and collaboration, as well as cost savings for businesses.

The Metaverse can also be used as a tool for education and training. Virtual classrooms and training programs can be created, allowing students and employees to learn in an immersive and interactive environment. This can lead to better retention of information and a more engaging learning experience.

Another potential use for the Metaverse is in entertainment. Virtual concerts, games, and other experiences can be created, allowing people to experience things that would not be possible in the physical world. This can also create new opportunities for artists and creators to monetize their work.

However, there are also some concerns surrounding the Metaverse, particularly around issues of privacy and security. As more and more of our lives move online, it is important that we are able to protect our personal information and data. It is also important that the Metaverse is accessible to everyone, regardless of income or background.

Overall, the Metaverse has the potential to revolutionize the way we live and work, but it is important that we approach its development in a responsible and ethical way. By doing so, we can unlock its full potential and create a better future for everyone.

Reff. - [1] <https://www.techtarget.com/whatis/feature/The-metaverse-explained-Everything-you-need-to-know>

-Tanmay Nayak (1st Year)

THE NEW GEN POWER HUB

The piezoelectric effect is the induction of an electric charge in response to an applied mechanical strain. It is a reversible process that results from the linear electromechanical interaction between the mechanical and electrical states in crystalline materials with no inversion symmetry. Lead Zirconium Titanate sensors or PZT sensors are the most common and economical man-made materials used for energy conversion processes, and the use of the HX711 transducer has enhanced the efficiency. Research has been conducted on energy scavenging techniques, such as a focused spring action between two tiles, which converts mechanical input onto the transducers and converts this input into electrical output. Results showed 600 μ W harvested from the 10Hz frequency and 10cm amplitude linear motion.

The piezoelectric pre-stressed bending mechanism for Impact Driven Energy Harvester is designed to increase the output wattage and maximize the output voltage. A 3D model with a middle hole has been designed to give space and support to the piezoelectric transducer during the bending process, which increases the electrical energy that had been generated. The output voltage for the 3D model without the middle hole or 0 mm in diameter only produces 5.40V in AC form. The author tried to increase the impact by using a spring retention action to increase the frequency in order to improve its efficiency.

The scope of this testing is to enhance the voltage output of the piezoelectric transducer before it is further used for footstep application. After the use of the device, the output voltage is 34.4V. The idea of energy harvesting has caught many people's interest, with ideas such as shoes that convert walking movements into heat, cell phones that charge themselves from body movements, roads that power streetlights, contact lenses that capture energy when you blink, and even gadgets that make energy from the pressure of falling rain. However, the amount of energy you could recover and the efficiency gain you would make for the money spent are minuscule. To save energy from cars, it is important to address the inefficiencies of car transportation much earlier in the process [1].

Reff - [1]<https://www.explainthatstuff.com/piezoelectricity.html>

-Debankar Subhram (2nd Year)

5G ANTENNA

Designing antenna arrays for 5G networks is a complex process that requires a thorough understanding of the individual antenna unit's behavior and its interaction with the surrounding environment. The process starts with assessing the antenna unit's performance on its own and then repeating the process with an infinite antenna array's periodic element. This helps engineers optimize the antenna array's properties like gain, return loss, side lobe, and beam steering. To design real-world antenna arrays, engineers must build a simulation that accurately describes the antenna units' interaction with each other and the edge of the array. This is done using the domain decomposition method (DDM), which allows engineers to assess the coupling of nearby antenna array units.

Once the mesh is created, simulation software like HFSS is used to optimize the antenna's performance. This involves optimizing properties like gain, return loss, side lobe, and beam steering using the Finite Array Beam Angle Calculator. The next step is to design the power distribution circuit across the array. This involves deciding on a target phase relationship and amplitude and designing the power feed network within HFSS until the goal is achieved.

Once the antenna array's power distribution circuit is optimized, engineers can connect all their work together into one simulation. They can add phase shifters to control the signal and perform a linear network analysis (LNA) to assess the return loss for this nearly completed simulation. To evaluate the antenna design's performance in its environment, engineers perform a system-level study using HFSS shooting and bouncing ray (SBR) technology [1]. This study tests the antenna's ability to send and receive signals within a large environment, such as a city block. The final result is a comprehensive and optimized antenna design that meets the demands of 5G networks. The process requires a deep understanding of individual antenna units, their interaction with each other and their environment, and the use of advanced simulation software and technology to optimize the antenna's performance.

Reff - [1] <https://www.ansys.com/blog/how-to-design-antenna-array-5g-applications?>

-Debankar Subhram (2nd Year)

THE FUTURE OF ORGAN PRINTING: 3D PRINTING

You might have heard of printing papers, ever heard of printing organs? Bravo! So have we reached the stage of becoming God? We will get to know this.

Organ printing, also known as bioprinting, is a rapidly developing field that uses 3D printing technology to create functional living tissues and organs. The technology involves printing layers of living cells onto a scaffold to create structures that mimic the shape and function of natural tissues and organs. While still in its early stages, organ printing has the potential to revolutionize healthcare by providing a new source of organs for transplant and advancing personalized medicine. Here are some potential future developments in the field of organ printing:

Improving cell viability: One of the biggest challenges in organ printing is maintaining the viability of the printed cells [1]. To function properly, the cells must be able to grow and differentiate into the various types of cells found in natural tissues and organs. Researchers are exploring ways to improve the viability of printed cells by optimizing the printing process, developing better cell preservation techniques, and using new types of bio-inks that can support cell growth.

Advancing organ complexity: While current organ printing techniques can create simple structures like skin and blood vessels, more complex organs like the heart, liver, and kidneys are still a long way off. Researchers are working on ways to print multiple types of cells together to create complex tissues and organs that can function properly. This will require new techniques for printing and manipulating cells, as well as a better understanding of how cells interact and communicate with each other.

Advancing personalized medicine: One of the biggest promises of organ printing is the ability to create customized organs that are tailored to each patient's unique needs. By using a patient's own cells to create the organ, the risk of rejection can be greatly reduced, and the organ can be designed to fit the patient's specific anatomy. Researchers are exploring ways to use advanced imaging techniques and computer modeling to create precise organ designs that can be printed to exact specifications.

After concluding the fact, the future of organ printing is exciting and full of promise. While there are still many challenges to overcome, the potential benefits for patients and healthcare are enormous. As technology continues to evolve and improve, we may see a day when printed organs are a routine part of medical care, providing a new source of hope for patients in need of life-saving treatments. Alas, we are not gods, but we definitely are the offspring of a god.

Reff - [1] <https://fortune.com/well/2023/02/15/3d-printed-organs-may-soon-be-a-reality/>

-Ashish Pradhan (1st Year)

EMBEDDED SYSTEMS

Embedded systems are computer systems that are designed to perform specific functions and are integrated into devices or products. These systems are found in everyday objects such as cars, home appliances, medical equipment, and industrial control systems. They are optimized for low power consumption, compact size, and real-time performance, making them ideal for applications where traditional computers are not suitable [1].

The key feature of embedded systems is their ability to perform dedicated tasks efficiently and reliably. This is achieved through the use of specialized hardware and software designed to meet the specific needs of the application.

Embedded systems often incorporate microcontrollers or microprocessors as their primary control unit. These devices are integrated circuits that contain a CPU, memory, and input/output peripherals, all on a single chip. Microcontrollers are designed to be low-cost, low-power, and high-performance, making them ideal for use in embedded systems. Microcontrollers can be programmed using various languages, including C, C++, and assembly language, to control the operation of the device. The code is stored in the device's non-volatile memory and executed by the CPU in real time. In addition to microcontrollers, embedded systems can also use other types of controllers, such as programmable logic controllers (PLCs). PLCs are used primarily in industrial automation and control systems.

There are several challenges associated with developing embedded systems. The first is the need for high reliability and safety, particularly in applications such as medical devices and automotive systems. The second is the need for low power consumption, as many embedded systems are battery-powered or rely on energy harvesting techniques. The third is the need for real-time performance, as many embedded systems operate in environments where delays or errors can have significant consequences.

Despite these challenges, embedded systems have become an essential part of modern life, with new applications emerging all the time. They are used in everything from consumer electronics to critical infrastructure, and the demand for skilled professionals in this field is growing rapidly.

Reff - [1] <https://www.geeksforgeeks.org/introduction-of-embedded-systems-set-1/>

-Chandan Kumar Dash (3rd Year)

THE IMPACT OF IOT ON THE MODERN WORLD

The Internet of Things (IoT) is a rapidly growing technology that has transformed the way we live and work. This brief thesis explores the impact of IoT on the modern world by examining the various applications of this technology in industries such as healthcare, agriculture, transportation, and manufacturing [1].

IoT has found applications in various industries such as healthcare, agriculture, transportation, and manufacturing. In healthcare, IoT devices are used to monitor patient health remotely, track medication adherence, and manage chronic conditions. In agriculture, IoT sensors are used to monitor crop growth, soil moisture levels, and weather patterns to optimize crop yields. In transportation, IoT is used to monitor vehicle performance, improve traffic flow, and reduce accidents.

In healthcare, IoT devices are used to collect data on patient health and provide personalized care. IoT-enabled devices such as wearable health trackers, smart beds, and smart inhalers, are used to monitor vital signs, track medication adherence, and manage chronic conditions. IoT devices are also used to monitor the health of elderly patients and improve their quality of life by providing assistance with daily tasks. IoT is also used in the development of smart hospitals, where sensors and devices are used to optimize patient flow, manage resources, and reduce the risk of infection.

In agriculture, IoT sensors and devices are used to collect data on soil moisture levels, weather patterns, and crop growth to optimize crop yields. IoT devices are also used to monitor the health of livestock, track the movement of machinery, and manage the use of water and fertilizers. IoT technologies such as precision agriculture and smart irrigation systems are transforming the way farmers work and are leading to more sustainable farming practices.

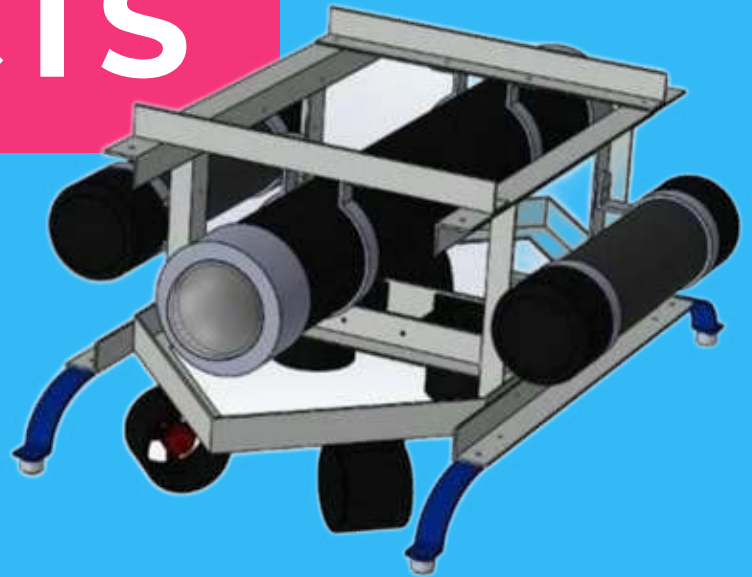
In transportation, IoT technologies are used to monitor vehicle performance, improve traffic flow, and reduce accidents. IoT-enabled devices such as connected cars and intelligent transportation systems are used to collect data on vehicle location, speed, and fuel efficiency. This data can be used to optimize routes, reduce emissions, and improve safety. IoT is also used in the development of autonomous vehicles, where sensors and devices are used to navigate roads and avoid obstacles.

Reff - [1] <https://www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/>

-Pramit Singh (3rd Year)

CLUB PROJECTS

ROBOTICS SOCIETY



ROUV(REMOTE OPERATING UNDERWATER VEHICLE)

The sole motto for designing this project is to surveillance of condition of Hirakud Dam and detection of the cracks. Due to high underwater pressure and turbulent flow of water, it has proved really difficult and risky for the divers to investigate the current condition of the Dam. ROUVs provide a safe alternative to exploring dangerous areas for divers both from shore or by divers in the water. A ROUV can be deployed underwater to gather remains and collect data. When divers are needed, ROUVS can inspect critical areas, while the diver determines the safest possible route. ROUVs are robust and rugged in design, built to withstand harsh water environments, and require minimal maintenance.

{Trilochan Basantia (EEE), Abhyuday Das(EE), Abhips Raj(EE), Ritulagna Tripathy(EE), M.Vamsi(EE), Ajit Kumar Jena(ETC), Saisumit Samantray(EE), Suraj Rai(EE), Asmi Jena(ETC), Nitindra Sahoo(EEE)}

ROBOTICS SOCIETY



ELECTRIC CYCLE

1) Electric Cycle is one of the effective solutions to tackle the global menace of Environmental Pollution & increase in the prices of Petrol and Diesel.

2) Equipped with a Li-on battery, DC motor, and Controller, It has various features:- a) Rechargeable battery which gets fully charged in 2 hours. b) Battery is getting charged by pedaling, so there is no problem with the battery draining. c) Attains a maximum speed of 20 kmph with a Payload of 65 Kg. d) Has mileage of 20-25 Km in one full charge. e) Price of the Cycle is very cheap.

3) Further here, we are planning to modify this cycle and make it a self-balancing one so that it will be user-friendly for differently abled people.

{Trilochan Basantia(EEE), Aditya Ranjan Sahoo(EEE), Ayushi Aggarwal (ChE), Debashish Pal(ME), Mahak Poddar(EEE), Mukesh Padhan(EEE), Om Sarangi(EEE), Ranjit Parida(EEE), Ritik Aggarwal(EEE), Om Parmar(CE)}



PROSTHETIC ARM

For the more than 5 million people worldwide who have undergone an upper-limb amputation, prosthetics have come a long way. Beyond traditional mannequin-like appendages, there is a growing number of commercial neuroprosthetics highly articulated bionic limbs, engineered to sense a user's residual muscle signals and robotically mimic their intended motions. But this high-tech dexterity comes at a price. Neuroprosthetics can cost tens of thousands of dollars and are built around metal skeletons, with electrical motors that can be heavy and rigid. It is an effort to replicate the movements of the human hand using a plastic 3D printed hand simulation (hand frame), using flex sensors and servo motors at a low cost. The flex sensors and servo motors coordinate with ARDUINO as their mediator to achieve this. The sensor sends the value to the ARDUINO the ARDUINO processes the data and sends it to the servo motors. Based on the values provided the motor moves and hence pulls the hand simulation, hence replicating the motion of the hand.

{Ritik Aggarwal(EEE), Ayush Singh(PE), Mahak Poddar(EEE), Priyanshu Aggarwal(EEE), Siddharth Panda(), Simran Das(EEE), Jyotirmayee Bhol(EEE), Trilochan Basantia(EEE), Suraj Rai(EE), Devjyoti Biswal(IT)}

AEROTECH



Team AeroTech, an official club of VSSUT Burla recently took part in Workshop-3 (UAV Fabrication Workshop) conducted by SAEISS at Vellore Institute of Technology, Chennai on the 20th and 21st of January 2023. The workshop was conducted under two categories, Class-Regular and Class-Micro. The Workshop dealt with manufacturing aircraft parts and assembling them all together along with the required equipment. The next day, the flight test of the manufactured aircraft was conducted. The Workshop was a great success and proved fruitful to both the teams of AeroTech and the members of EEE who were a part of it. The team is also focussing on research and is trying to find the applications of UAVs in various sectors such as agriculture, rescue operations & industrial inspections. Team AeroTech is now working on its new project and has begun preparations for SAE DDC 2023 (Drone Development Challenge).

{ Alok Behera(EEE), Jitendra Oram(ME), Jyotirmayee Patra(ME), Chandan Shaw(ME), Soumya Ranjan Behera(EEE), Sachin Panigrahi(EEE), Debashish Das(EEE) }

IDEA & INNOVATION CELL



The team is working towards

- To inculcate multidisciplinary approach for applied research in problem solving.
- Sustainability comprises students who are curious problem solvers, responsible and team players have a vision for environment for better living satisfying United Nation's sustainable development goals (SDGs).

The team has designed a lowcost hand press for handmade paper from waste paper from the university such as old files, documents, cartons, old examination papers, and assignment papers etc. The target is to upcycle the waste with value addition for different applications. The scope of the team is not limited to waste paper, it will also take up other technical issues in handling the waste for a sustainable future. This will reduce the waste and also help in socio-economic growth when it will extend to nearby society.

{ **Saroj kumar Samal (EEE)**, Swadhin Jena (ETC), Sandipan Mohanty (ETC), Baibhav R. Moharana (CE), Subhashis S. Behera (CE), **A. Narayan Subudhi (EEE)**, **Md. Tasik (EEE)**, Ankita Panigrahi (EE), Shreevidya Joshi (EE), Purbasha Kar (MME) mentored by **Dr. Sasmita Behera (EEE)** and **Dr. Santi Behera (EEE)** under Idea and Innovation Club. }

IDEA & INNOVATION CELL

HIMAT - Human Identification Model Artificially Trained

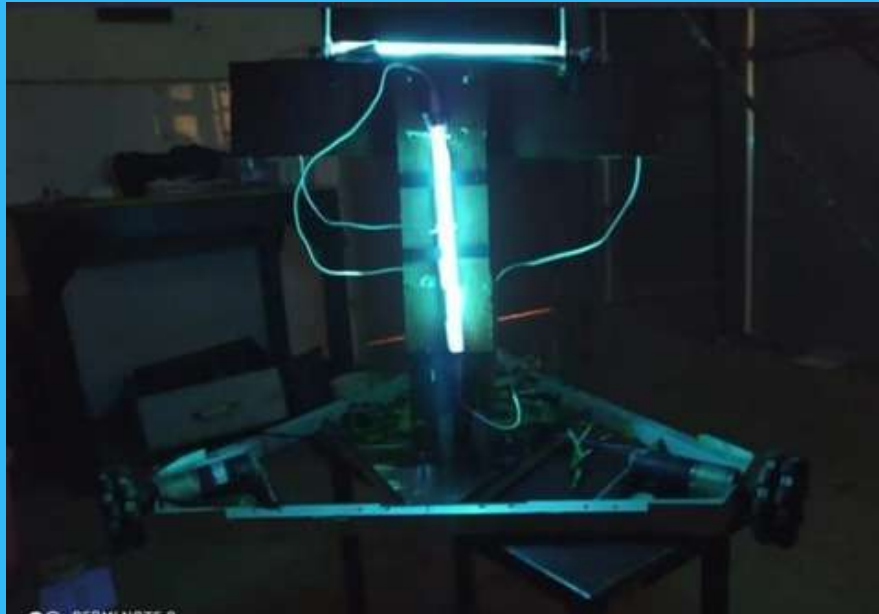
The idea of a model-based gait recognition method using data collected by a flash lidar camera could effectively improvise the surveillance system. However, in order to be more precise the errors in joint location needed to be minimised. GlidarCo takes an unorthodox approach, by way of a filtering mechanism that corrects faulty skeleton joint positions to effectively improve the quality of joint localization and gait recognition. Moreover, to incorporate motion dynamics, robust statistics are integrated that can effectively improve the performance of the designed features that only employ traditional feature moments over the gait cycles.

This Project Own 3rd Prize in Dare to Dream challenge organised by the Defence Research and Development Organisation, DRDO India.

Submitted Research Paper on “Controlling Wideband frequency synthesizer using PIC microcontroller” to Advanced Sensor and Signal Processing Division of Vikram Sarabhai Space Centre, ISRO, Thiruvananthapuram.

{Punyaslok Swain and team}

ROBOTICS SOCIETY



UVRAS

UVRAS is a remotely operated robot that emits UV rays for disinfection by performing omnidirectional motion in an unmanned space-planning-based project that was developed keeping the needs of the COVID-19 situation in view. The robot can be operated with a remote control set to enable the user to sanitize the area without coming in contact with objects.

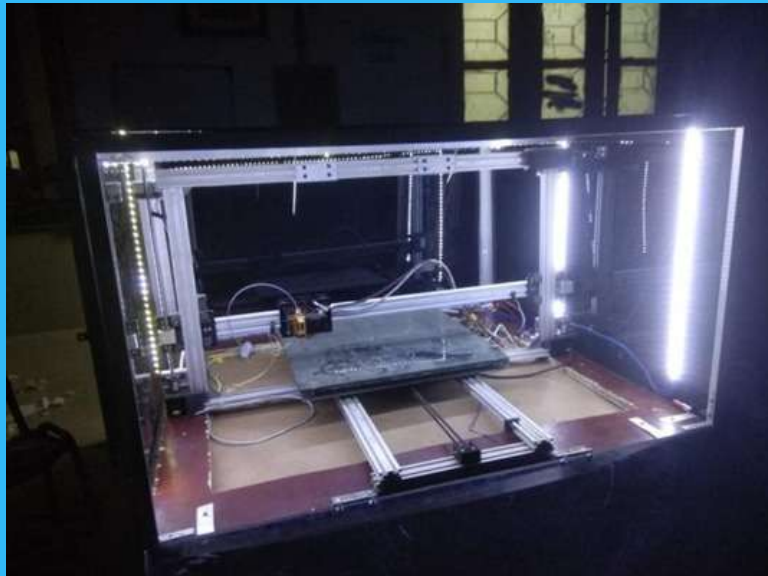
Since the bot is omnidirectional, it can move to any part of the targeted area for sanitization work. It is fitted with a camera to provide real-time feed on your mobile.

The UVRAS emits UV light to disinfect enclosed areas such as hospital rooms, doctors' chambers, operation theatres, restaurants, and meeting spaces. This device also has a camera that gives a real-time video of the area where it will be deployed for sanitization. The tool provides the best solution to our problem.

production applications and using this we also print differently.

{Trilochan Basantia(EEE), Abhyuday Desh(EE), Abhips Raj(EE), Ayush Singh(PE)}

ROBOTICS SOCIETY



3D PRINTER

3D printing is a form of additive manufacturing Technology. It means that it is created by laying down successive layers of ma

It is Odisha's low-cost student-made 3D printer by VSSUT Robotics. The only printer in Asia that can support printing of 80 by 80 which is very large in size is quite a commendable achievement of our club. This 3D printer is actually a 3 in 1, multitasking printer, i.e., by default, it is a 3D printer, apart from that it is a CNC as well as a Laser Engraver. It is commonly used for modeling, and production applications, and using this we also print different parts of the robots. In this world of innovation, we are sure that this technology can revolutionize and reshape the world in a better way.

The benefits of the 3D printers are-

Advance time-to-market turnaround, Save on tooling costs with on-demand 3D printing, Reduce waste with additive manufacturing, Improve lives, one customized part at a time, Save weight with complex part designs, and Reap the benefits of 3D printing.

The disadvantages of 3D Printers are-

Limited Materials. While 3D Printing can create items in a selection of plastics and metals the available selection of raw materials is not exhaustive
Restricted Build Size Post Processing, Large Volumes, Part Structure, Reduction in Manufacturing Jobs, Design Inaccuracies, Copyright Issues

{Trilochan Basantia(EEE), Ritik Aggarwal(EEE), Samvas Majhi(IT), Suraj Rai(EE), Subhalaxmi Mishra(EEE), Mahak Poddar(EEE), Arman Bhanja(EEE)}



Prof. Rabindra Kumar Sahu

1. Received best paper award at IEEE International Conference on Circuit, Power, and Computing Technologies (2013).
2. MHRD, Govt. of India fellowship in 2000 and 2004.
3. Name listed in top cited(top 2%) scientists by Stanford University and Elsevier

Dr. Gyan Ranjan Biswal

1. Fellow of IE (India) in the year 2019; Senior Member- of IEEE, USA in the year 2017, and Life Member of ISTE, India in the year 2004.
2. Adapted one international edition book, Digital Fundamentals, Pearson India.
3. Recipient of MHRD Fellowship, and Centre for International Cooperation in Science (CICS) jointly awarded by INSA-CSIR-DAE/BRNS-CICS.
4. Recognized as Outstanding Contributions in Reviewing by ISA Transactions and Int. J. Hydrogen Energy, Elsevier for the year 2017



Dr. Santi Behera

1. State award: Institution prize 2019: Power quality analysis of the hybrid SPV-wind integrated system with the use of FC and STATCOM.
2. Institution award in 2020 for detection and classification of fault in DG system by NEURO-FUZZY.
3. Institution award in 2005, at 46th annual technical session, Institution of Engineers(INDIA), ODISHA

Dr. Sasmita Behera

1. BEST PAPER AWARD at the International Symposium of the Asian Control Association on Intelligent Robotics and Industrial Automation
2. Member Institution of Engineers (India), Life Member ISTE, INDIA, Life Member Odisha Bigyan Academy.



Dr. Bibhuti Prasad Sahoo

1. Awarded MHRD Fellowship, 2009-11
2. Won Best Paper award at National Conference on Recent Advanced Trends in Electrical, Electronics and Information Technology



SUDHANSU PANIGRAHI

Final Year Undergrad

3RD PRIZE IN Dare to Dream 3.0 Pan India Innovation Contest organized by DRDO.

Team Members: Siddharth Mohanty, Anshuman Mohapatra

TRILOCHAN BASANTIA

Final Year Undergrad

2nd Prize in Smart India Hackathon
1st Prize in Applied singularity all India Hackathon



K PIYUSH KUMAR

Final Year Undergrad

Volunteered as IEEE Ambassador and stood in the top 20 in whole student branches.

JYOTSANA KUMARI GUPTA

Final Year Undergrad

Was in the Top 30 all India in Tata Steel Women of Mettle
2nd Prize in Skill-A-Thon pitch perfect
Secured 3rd position in Dare to Dream 2.0
East Zone Finalist in TATA CRUCIBLE



RITIK AGRAWAL

Final Year Undergrad

1st Prize in Deep Tech Ideathon - 2021

ARYAN PATEL

Final Year Undergrad

Among the top 40 student developers selected across the country in the GDC software engineering fellowship organized by AICTE



Achievements

PALLAVI SHARMA
Pre-Final Year Undergrad

1ST PRIZE in Badminton tournament by IIM SBP.
1st position in discuss throw & javelin throw,
3rd Position in 100 mtr & shot put - Illumina 2022
1st position in discuss throw
2nd position in shot-put and kabbadi inter-house competition
1st position in inter-house badminton and kho kho tournament. -
Illumina 2023.



SNEHA SINGH
Pre-Final Year Undergrad

56th position in TechGig Geek Goddess 2022

NITINDRA KUMAR SAHOO
Pre-Final Year Undergrad

1st Prize in Designing IOT, AI&ML
Systems Competition



DILIP KUMAR JENA
Pre-Final Year Undergrad

Finalist in Smart India Hackathon
Got selected for further rounds in Mars Rover Challenge by
NASA and prototype round in CANSAT by ISRO

SOURAV SAHIL EKKA
Pre-Final Year Undergrad

2nd in men's relay, 3rd in mixed relay,
2nd in 800m in Illumina 2022
1st in inter-house football+top goal
scorer in Illumina 2023



OUR START-UP



Nerdbytes



Nerdbytes is a group of budding engineers formed to address real-time issues and bring out cost-effective and highly efficient solutions with the implementation of advanced technology. Nerdbytes is on the verge of being the 2nd Registered Startup based in VSSUT, Burla.

The company is focused on extensive inter-disciplinary research and product development based under the Department of Electrical and Electronics Engineering, VSSUT, Burla in the field of MEMS applied Sensing technologies, Optoelectronics, and Process Automation to cater to the needs of the major sectors of the Indian economy like Aerospace, Defence and Power Sectors, etc.

The company is cofounded by Er. Soumya Debashis Das, Junior Research Fellow, EEE, Mr. Siddharth Mohanty, B-Tech (Final Year) EEE, Mr. Ahwan Pradhan, B-Tech (Final Year) EE, and Mr. Binay Mohanta, B-Tech (Final Year) ME and is currently being mentored by Dr. Gyan Ranjan Biswal, Associate Professor, EEE.

Active Collaborations:

- International collaboration with Prof. Harald Haas, Father of LiFi, LRDC, University of Strathclyde, Glasgow, UK.
- National Collaborations and mentorship with Prof. Bidyadhar Subudhi, IIT Goa and Prof Narayan Prasad Padhy, Director, MNIT Jaipur respectively.

Achievements of Team Nerdbytes:

- 2 (Two) Published Patents out of which 1 has been approved for Transfer of Technology.
- 2nd Runners up in Dare to Dream 3.0 Innovation Contest organized by DRDO for the project entitled "Mobile detection of CBRNe agents"
- Winners AAKAR organized by IEEE AES Bombay Chapter for the project on " Gas Density Monitoring System for Industrial Gas Pipelines"
- Finalists' 5th Edition of Techgium organized by Larsen and Toubro Technology Services (LTTS) for prototyping a " Dynamic Charging and Battery Management System for Electric Vehicles"

With an experience of facing a few setbacks, the motive of the team is to consider constructive criticism and obstacles as a part of winning the game and not giving up the urge to take up problems and solve them efficiently

Projects are undertaken/ongoing:

- Development of a Gas density monitoring and leakage detection system for industrial pipelines.
- Integration of Optical Wireless Power Transfer for self-powered operation of sensing technologies.
- Development of a MEMS-based chemo-sensor module for the detection of explosive vapors
- Modelling and dynamic charging of a mini-Unmanned Ground Vehicle (UGV) to be deployed in war zones for the detection of CBRNe agents.

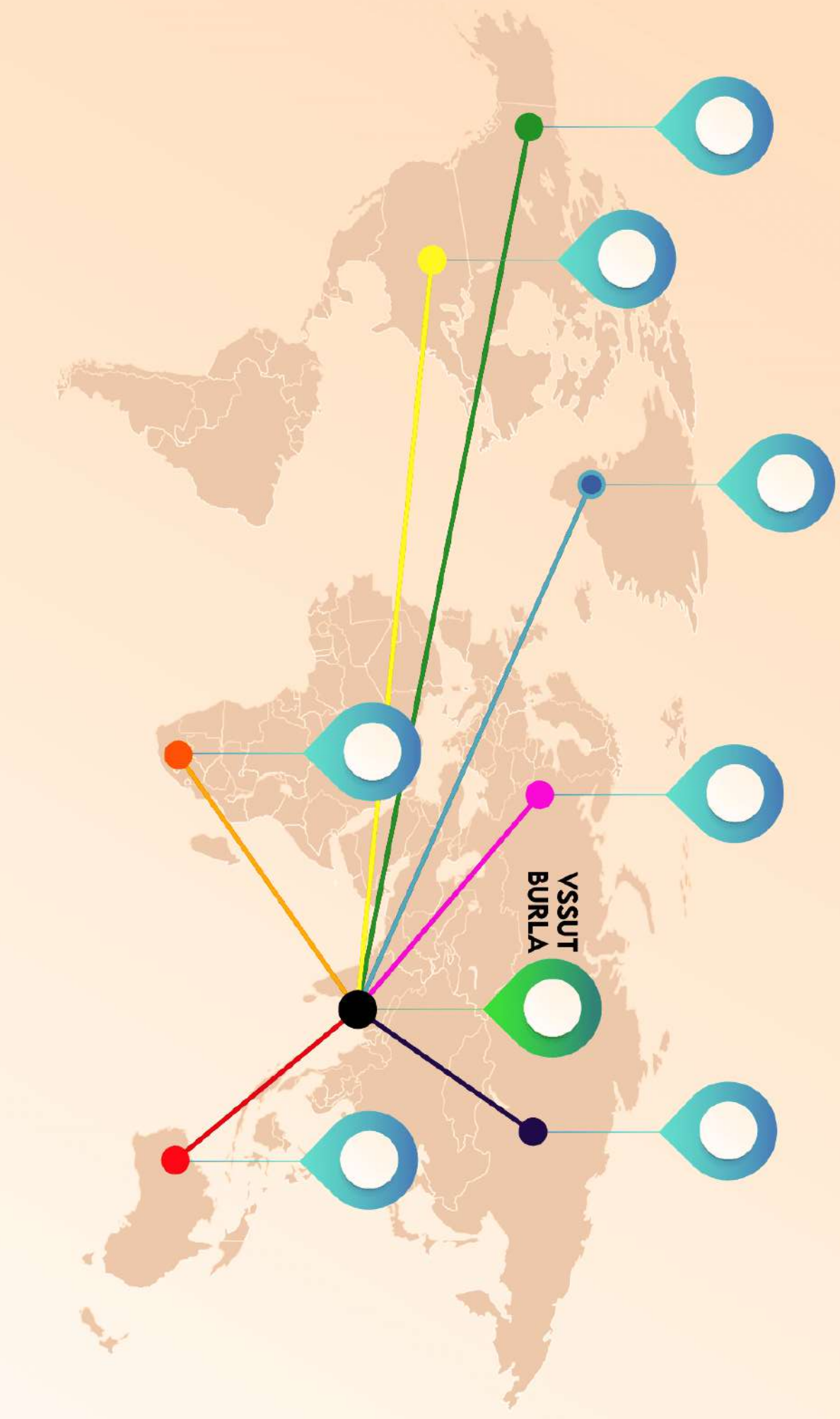
Future Plans and Collaborations:

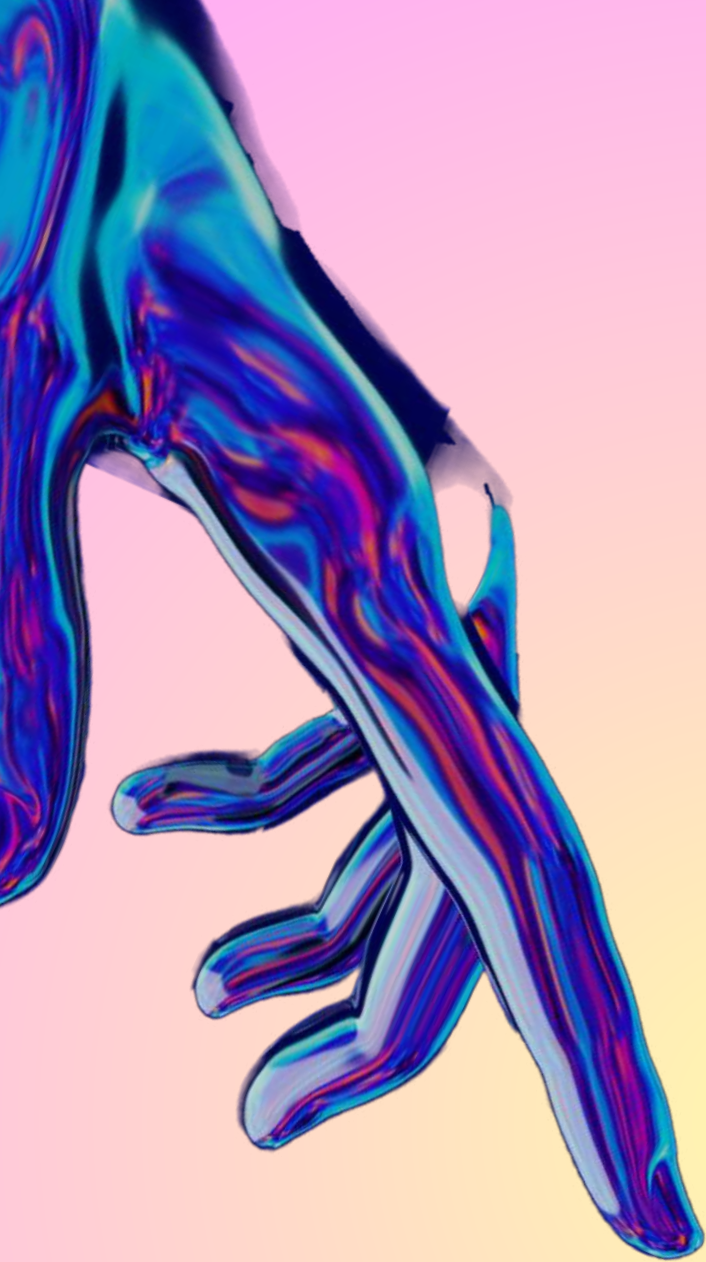
- Establishment of a full-scale national-level startup with R&D facilities for extensive research and product development is under progress.
- Talks for Progressive Collaboration and MoU with General Electric, India, CPRI, Bengaluru, NML Jamshedpur (CSIR Lab), JMI, New Delhi, CEERI Pilani & VIT, Vellore is under progress.

FACT CHECK

1. The Möbius strip is a non-orientable surface with only one side and one boundary. This means that if you were to travel along its surface, you would eventually end up back where you started, but with a twist - literally.
2. The Möbius strip is named after the German mathematician August Ferdinand Möbius, who discovered it in 1858. However, the concept of a one-sided surface had been explored by others before him.
3. The Möbius strip is often used as a symbol of infinity since it has no beginning or end. It is also used as a symbol of unity since its surface is continuous and connected.
4. The Möbius strip has several interesting properties. For example, if you cut a Möbius strip down the middle, you will not get two separate pieces, but rather one longer Möbius strip with twice the number of twists.
5. Another interesting property of the Möbius strip is that it has only one edge, despite appearing to have two. This is because the strip is formed by twisting and gluing the ends of a strip of paper together.
6. The Möbius strip is also used in mathematics and science to study topology, the branch of mathematics that deals with the properties of objects that do not change under continuous transformations.
7. The Möbius strip has practical applications in engineering and materials science, where its one-sided surface and unique properties have been used to create specialized materials and structures, such as Möbius-shaped nanoribbons and Möbius-shaped tires.

CONNECTING ALUMNI OVERSEAS





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