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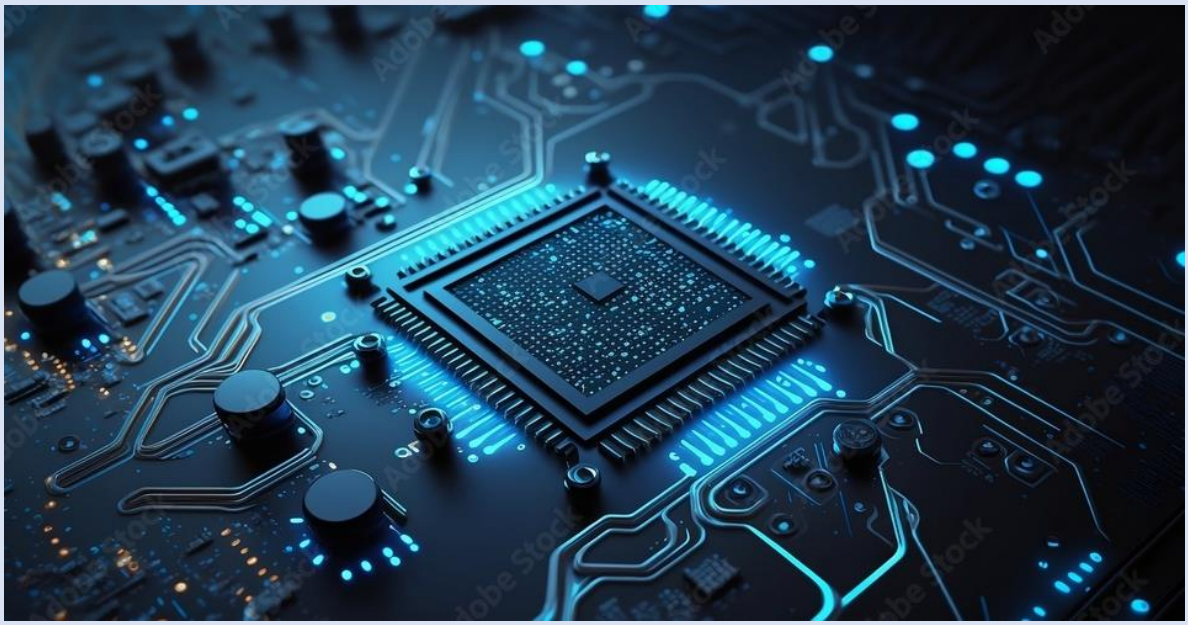
DEPARTMENT OF ELECTRONICS ENGINEERING

SARDAR VALLABHBHAI NATIONAL INSTITUTE OF TECHNOLOGY

SURAT, GUJARAT,INDIA



This issue covers:

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MESSAGE FROM HEAD OF THE DEPARTMENT

The Department of Electronics Engineering was established in the year 1982. The department offers B. Tech. program with an intake of 170, M. Tech (Communication Systems and VLSI & Embedded System) with an intake of 15 in CS and 30 in VLSI & ES and Ph. D. with a current strength of 70 research scholars. The research is carried out in various fields of Electronics and Communication Engineering such as artificial intelligence, machine learning, signal processing, wireless communication, microwave and optical communication, sensors, micro-nano devices, etc. Currently we have 28 skilled and experienced faculty members of various domains of Electronics Engineering.

The department has advanced research labs like VLSI design and TCAD lab, communication research lab, sensor research lab, machine learning & computer vision lab, Nanoscale Device and Circuit Research lab, 5G and Beyond lab useful to our PG students. Department is growing in all dimensions in terms of research facility, student strength, infrastructure, advanced teaching/learning methodologies, and industrial collaboration. The department has enthusiastic UG and PG students. Their aspiring minds has been helpful in taking the department to new heights. Their placement record has been improving year by year, most of our M.Tech. students are associated with renowned industries for their internship in the second year of their curriculum. Not only the research scholars and PG students are involved in the research activities but B.Tech. students also participate in various competitions and achieve appreciable results. We are rigorously putting our efforts to establish a bright culture and space for research and startups. This newsletter presents the various activities and achievements by the DoECE family. We, as a team are working meticulously to achieve the set standards for the overall growth of the department and its stakeholders committed to achieve the Mission and Vision of our department.

Prof. J. N. Sarvaiya
Prof. & Head, DoECE
SVNIT, Surat

Mission

The mission of the Electronics Engineering Department is to contribute to society and industry through excellence in education, research, innovations and ethics by stakeholders.

Vision

The vision of the Electronics Engineering Department is to Aim to achieve quality in education and research to create leading Electronics engineers, researchers and entrepreneurs.

DEPARTMENT CORNER

- **A Walk to Remember**
- **New Talent of DoECE**
- **Departmental Events**

A WALK TO REMEMBER

A walk to remember…

I am not good at saying Goodbyes. Actually, I wish that I should never get to say Goodbye. And yet… here I am… taking your leave… handling one of the most significant Goodbyes of my life. On the journey called life, my hand is held by destiny who walks side by side with me, guides me, distracts me, controls me. And I walk with her. Sometimes happily, and forcefully at others. Sometimes I appreciate her for her amazingly surprising ways of entangling people and situations and their timings and their places and sometimes I loathe her for the secrets she holds for the future. But today, as I step on the threshold of my career, I stop. I feel the 'lub-dub' of my throbbing heart. And I take a look back to my professional journey of 27 years.

Pause.

Play.

My first class of Basic Electronics in B. E. I (Mechanical Engineering) at Priyadarshini College of Engineering and Architecture (PCEA), Nagpur. On November 4th, 1997, I went to the class - little stressed, got up on the dais, and blew a layer of chalk dust from the teachers' table to put my attendance register and notes. Instantaneously, all the boys sang the Happy Birthday song. Everyone laughed and my mood got lightened. I promised them a basket of Cadbury Eclairs as a return gift and started teaching the difference between Metals, Semiconductors and Insulators. Haha! I started by teaching Semiconductors to first year-ites and I am concluding by teaching Semiconductor Physics to first year-ites. What a coincidence!

I always find myself comfortable with students and feel young and creative with them. So, I started a students' club called Tele-Era in PCEA. Last year I was invited by their current Faculty Advisor for silver jubilee celebrations. Felt grateful.

After serving PCEA till 2005 and GEC Surat till 2007, I joined SVNIT, Surat on July 19th, 2007.

Pause.

I remember everything quite vividly.

Play.

The call from the then HoD, Prof. B. R. Taunk, about my selection…

The warm welcome extended by Mdm Nila Desai…

My familiarization with the department…

Teaching Antennas and Wave Propagation to B. Tech. EC III…

And my acquaintance with all the faculty members, which turned into a friendship of lifetime. I must admit that I was a bit apprehensive about me - a Maharashtrian - being accepted by the well settled Gujju crowd. But they proved me wrong. They exceeded my expectations and made me feel quite homely very soon. They have created so many memories that I really fall short of words to pen them down. Our works, our events, our tea-club, our interactions, our evaluations, our togetherness, our unity and our harmony! We all have aged together and got gray hairs and shared happy memories and stood with each other during crisis. The nonteaching staff always extended strong support. My superb PG and PhD students whose hard work, learning nature and problem solving attitude always showed in their work will always be appreciated. DoECE family is and always will be in my heart. I wish it all the glory.

Pause.

Play.

The memories of starting IETE Students' Forum (ISF) in 2008 are still fresh. And why wouldn't they be? My association of 11 years with ISF has blessed me with a company of enthusiastic volunteers - creative, passionate, zealous, mischievous, and sometimes throwing tantrums, and demanding importance too. It is the vastness of human nature which I have learnt to appreciate due to my connect with ISF. And I am happy that almost all ISF executive body members are well placed today in their lives and professions. And even after so many years of graduation, they connect through email or come to meet personally. I feel grateful.

But grass is not always green.

In 2011-12, on the night of 23rd January 2012, we lost Sundeep Kumar Saini; yes; Sundeep with a 'u' and not an 'a', most enthusiastic and ever-smiling Co-Chair of ISF to a fatal heart condition. He was the driving force behind organizing circuit design and open project competition for all the circuit branch students. He brought a registration of 132 students for the event. A month later, with a heavy heart, the then ISF team started Sundeep Memorial Project Competition (SMPC). I always asked him why he spelt his name the way he did. He said 'Lambi story hai Ma'am; kabhi fursat me bataunga'. So, I learnt to live with the fact that I am never going to get that answer. It hurts that we lost him. But I am sure that his legacy will never ever be lost.

Pause.

Play.

Out of seventeen years' service at SVNIT, I looked after Gardening and Campus beautification activities for a total of around eleven years. I am thankful to the authority of SVNIT for providing me this opportunity. When I started, most of the campus was jungle and unlevelled land. With the help of Gardening staff, Team members and under the guidance of various Deans (P&D) and Hon'ble Directors of the Institute, I tried to make most of it. I was an amateur and hobbyist when I started. I dare to take a little pride that I have become a plantsperson (not in real sense, but, upto a certain degree for a non-technical person) now. I really owe to three cyclones, many thunderstorms, Covid-19 pandemic and numerous activities of Gardening section for nurturing me over a long period and keeping me grounded. I learnt that one should always bow down in agreement with the nature.

Pause.

Play.

What do I say about the women employees of Institute! They are supremely talented, most honest, hard-working, compassionate, passionate, empathetic, able, determined, and the bravest of the braves. I have seen them following ‘saam-daam-danda-bhed’ to ensure that the students learn properly. I have also seen them giving a shoulder to cry when students are in distress. I have seen them scolding students for improper dressing. I have also seen them fighting fiercely for their safety and security. They are a constant source of inspiration. I like to call them ‘T4 - The Thick and Thin Team’.

Pause.

Play.

See, I told you I am not good at saying goodbyes. Rather, I am so bad that I am finding it difficult to wind up my farewell message. There is so much to say… to so many cabins… to so many classrooms… to so many labs… to so many trees… to so many students… to so many people…

And I feel completely lost. I feel hesitant. I feel humbled. I feel overwhelmed. I feel immensely indebted.

I really don’t know how to sign off.

Rasika Dhavse

Associate Professor

DoECE, SVNIT, Surat

NEW TALENT OF DoECE

Dr. Sandeep Mishra and Dr. Partha Das joined the DoECE family in October 2023.

Dr. Sandeep has done the M.Tech. from BPUT Rourkela and Ph.D. from NIT Meghalaya in VLSI Design. His Research Interest include VLSI Design, Memory Design, Mixed Signal Circuits, and Intelligent Transportation System. Besides he is also fond of Photography.

Dr. Partha Das completed his M.Tech. from Institute of Radio-physics and Electronics, Calcutta University in VLSI Design and Ph.D. in VLSI Devices from NIT Durgapur. His research interest include GaN based Devices (HEMT), Resistive Memory Devices (RRAM), Rectenna for Infrared Energy Harvesting,

GLIMPSES OF DEPARTMENTAL EVENTS

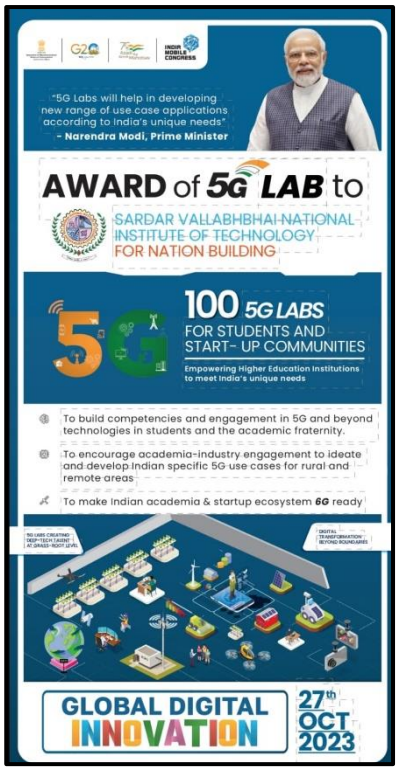
- **GANDHI NIRVAN DIN** was observed on 30th January 2023. The Father of our nation was remembered by the DoECE family members.

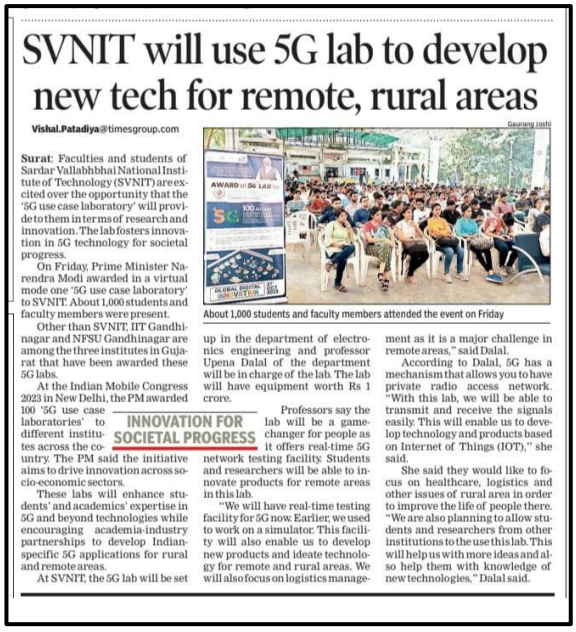
- **SWACHHATA PAKHWADA 2023** was observed from 23rd September to 7th October 2023 during which the department took Swachhata Pledge on 03/10/2023.

The Department won first prize for the Best Clean Department.

- **AWARD of 5G USE CASE LAB**

  The department received 5G use case laboratory from DoT. The grand handover event was arranged by Ministry on 27th October, 2023. Our honourable PM Sh. Narendra Modi addressed the students and staff fraternity via video conferencing from Pragati Maidan, New Delhi. The clips of this event covered by media are presented for our readers.





SVNIT will use 5G lab to develop new tech for remote, rural areas

Vishal.Patadiya@timesgroup.com

Gaurang Joshi

Surat: Faculties and students of Sardar Vallabhbhai National Institute of Technology (SVNIT) are excited over the opportunity that the '5G use case laboratory' will provide to them in terms of research and innovation. The lab fosters innovation in 5G technology for societal progress.

On Friday, Prime Minister Narendra Modi awarded in a virtual mode one '5G use case laboratory' to SVNIT. About 1,000 students and faculty members were present.

Other than SVNIT, IIT Gandhinagar and NFSU Gandhinagar are among the three institutes in Gujarat that have been awarded these 5G labs.

At the Indian Mobile Congress 2023 in New Delhi, the PM awarded 100 '5G use case laboratories' to different institutes across the country. The PM said the initiative aims to drive innovation across socio-economic sectors.

These labs will enhance students' and academics' expertise in 5G and beyond technologies while encouraging academia-industry partnerships to develop Indian-specific 5G applications for rural and remote areas.

At SVNIT, the 5G lab will be set up in the department of electronics engineering and professor Upena Dalal of the department will be in charge of the lab. The lab will have equipment worth Rs 1 crore.

About 1,000 students and faculty members attended the event on Friday

INNOVATION FOR SOCIETAL PROGRESS

Professors say the lab will be a game-changer for people as it offers real-time 5G network testing facility. Students and researchers will be able to innovate products for remote areas in this lab.

"We will have real-time testing facility for 5G now. Earlier, we used to work on a simulator. This facility will also enable us to develop new products and ideate technology for remote and rural areas. We will also focus on logistics management as it is a major challenge in remote areas," said Dalal.

According to Dalal, 5G has a mechanism that allows you to have private radio access network. "With this lab, we will be able to transmit and receive the signals easily. This will enable us to develop technology and products based on Internet of Things (IOT)," she said.

She said they would like to focus on healthcare, logistics and other issues of rural area in order to improve the life of people there. "We are also planning to allow students and researchers from other institutions to the use this lab. This will help us with more ideas and also help them with knowledge of new technologies," Dalal said.

अतुल्य हिन्दुस्तान

www.atulyahindustan.com

सूरत की एसवीएनआईटी को 5G प्रयोगशाला के लिए मौका मिला, मोदीजी ने वर्चुअली सौंपा : डॉ. उपेना दलाल

अतुल्य हिन्दुस्तान संवाददाता

सूरत, 27 अक्टूबर, 2023 को अंतर्राष्ट्रीय मोबाइल सम्मेलन 2023 के उद्घाटन के दौरान, मा. प्रधानमंत्री श्री नरेंद्र मोदीजी ने वर्चुअल कॉन्फ्रेंस मोड में पूरे भारत के विभिन्न 100 इंजीनियरिंग कॉलेजों को 100 5जी प्रयोगशालाओं का उद्घाटन किया और उन्हें सौंपा। इसमें गुजरात के तीन संस्थानों में एसवीएनआईटी, सूरत भी शामिल है।

यह कार्यक्रम सुबह 9.30 बजे से दोपहर 12.30 बजे के दौरान आयोजित किया गया। एसवीएनआईटी के लगभग 1000 छात्र और संकाय इस उद्घाटन के गवाह बने इस 5G उपयोग केस लैब के लिए 1 करोड़ रुपये के 5G लैब उपकरण इलेक्ट्रॉनिक्स इंजीनियरिंग विभाग को सौंपे जाएंगे। डॉ. उपेना दलाल इस परियोजना की पीआई हैं और सह-पीआई के रूप में पांच अन्य संकाय सदस्यों की टीम है।

इस अवसर पर उन्होंने बताया कि 5G तकनीक से उद्योग क्रांति हुई है और हम आगामी समय में लॉजिस्टिक सेवाओं को बेहतर से बेहतर बनाने की दिशा में काम करेंगे। 4.0 कि यह क्रांति नई दिशा प्रदान करेगी।

- **VIGILANCE AWARENESS WEEK** was observed from 30-10-2023 to 05-11-2023 during which department took pledge for being vigilant against corruption on 30/10/2023. A quiz and slogan competition were organized by the department. Dr. Shilpi Gupta and Dr. Shivendra Yadav were the winners of the slogan and quiz competition respectively.

FACULTY CORNER

- Journal and Conference publications
- Book and Book Chapter Publications
- Sponsored Projects
- Other Achievements

Journal Publications

The details of publications by faculties in reputed journals and conferences during the year 2023 is as follows:

1. Krishnan B. Iyengar, Raghavendra Pal, Upena Dalal, A dual phase genetic algorithm for improved initial access in 5G millimeter wave communication, Physical Communication, Volume 59, 102081, ISSN 1874-4907, 2023, doi:10.1016/j.phycom.2023.102081.
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12. Shubham Anjankar, Rasika Dhavse, "Design and optimization of MOS capacitor based radiation sensor for space applications" in Arabian Journal for Science and Engineering, accepted in Dec 2023.
13. S. Anjankar and R. Dhavse, "Extensive thermal-range simulation study of interface traps and oxide charges in an oxide optimized MOS-capacitive radiation sensor for space applications," Journal of Korean Physical Society, Springer , accepted in Dec 2023.
14. Anushtha Nimavat, Aman Sah, Tushar Pokhra, Abhishek Tripathi, Shilpi Gupta, “Analysis of Hermite-Gaussian and Laguerre–Gaussian modes in mode division multiplexing based FSO system”, *International Journal of Optoelectronics and Advanced Materials*, vol 17, 2023.
15. Krupali Umaria, Shweta Shah, “Dual iterative algorithm for hybrid beamforming in mmWave downlink massive multi-user MIMO systems”, *Analog Integrated Circuits and Signal Processing*, 115, 111–123, 2023, doi:10.1007/s10470-022-02131-x.
16. Srivastava, Shobhit, et al. "Understanding the Impact of Extension Region on Stacked Nanosheet FET: Analog Design Perspective." *Solid-State Electronics* 208: 108758, 2023.

17. Abhishek Acharya, et al. "Epitaxial Layer-Based Si/SiGe Hetero-Junction Line Tunnel FETs: A Physical Insight." *Advanced Ultra Low-Power Semiconductor Devices: Design and Applications*: 165-186, 2023.
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Conference on Embedded Systems (VLSID), Hyderabad, India, 2023, doi: 10.1109/VLSID57277.2023.00041.

3. P. N. Patel and A. S. Goteti, "Performance Analysis of MultiUser MIMO Indoor Visible Light Communication Systems," *2023 2nd International Conference on Paradigm Shifts in Communications Embedded Systems, Machine Learning and Signal Processing (PCEMS)*, Nagpur, India, 2023, doi: 10.1109/PCEMS58491.2023.10136075.
4. Sudhanshu Janwadkar and Rasika Dhavse, "XOR-Free Approach Towards Realization of Low Pass FIR Filter in Bio-Medical Signal Acquisition", IEEE 20th India Council International Conference (INDICON), Dec 2023.
5. Ramya R, Shilpi Gupta, "Circularly Polarized Sector Patch Antenna with Fractal Defected Ground Structure", *Proceedings of 4th International Conference on Emerging Technology Trends in Electronics, Communication and Networking in LNEE* (Springer), 2023.
6. Aishwarya, Abhishek Tripathi, Shilpi Gupta, "Performance analysis of OFDM based wireless over Fiber Communication System", *Proceedings of 4th International Conference on Emerging Technology Trends in Electronics, Communication and Networking in LNEE* (Springer), 2023.
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8. Swati, Dheeraj Verma, Jigna Prajapati, and Pinal kumar Engineer, "Quantization Effects on a Convolutional Layer of a Deep Neural Network", *Proceedings of Congress on Control, Robotics, and Mechatronics: CRM 2023*, March 25-26, 2023
9. Mitul Sudhir kumar Nagar, Rahul Kumar and Pinal kumar Engineer, "Parallelizing Non-Neural ML Algorithm for Edge-based Face Recognition on Parallel Ultra-Low Power (PULP) Cluster", *12th Mediterranean Conference on Embedded Computing (MECO),* June 6-10, 2023
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21. Hitarth Narsi Patel, Rajesh Kumar Sharma, Deepak Joshi, Vivek Garg, "Prospective Performance Enhancement of Cu2BaSn(S,Se)4 Based Solar Cell by Optimizing Buffer Layer and Metal Contact", *40th European Photovoltaic Solar Energy Conference*, Lisbon, Portugal, 2023.
22. Mahesh B. Hasani, Kirti Inamdar, "Study of Electromagnetic Interference Shielding Effectiveness of Conductive Polymer Composites", *IEEE Microwaves, Antennas, and Propagation Conference (MAPCON),* Ahmedabad, Gujarat*,* 2023.
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30. A. Samanta, S. Yadav, S. K. Pandey, G. Siddharth, and Vivek Garg, Numerical Simulation: Design and Optimization of CsSnI3 and Cs3Sb2Br9 based Multijunction Solar Cell, "40th European Photovoltaic Solar Energy Conference", Lisbon, Portugal, 2023.
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33. Sujit Kumar, Vivek Garg, S. K. Pandey, “Numerical Investigation of Lead-Free Halide Perovskite with All-Inorganic Transport Layer”, *40th European Photovoltaic Solar Energy Conference*, Lisbon, Portugal, 2023.
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37. Nithin Chatterji, and Pradeep R. Nair, “Minimum bandgap criteria for carrier selective layers in Si solar cells”, *40th European Photovoltaic Solar Energy Conference*, Lisbon, Portugal, 2023.

Published Book

1. Parekh, Rutu and Dhavse, Rasika, Nanoelectronics: Physics, Technology and Applications, IOP Publishing, 2053-2563. ISBN: 978-0-7503-4811-9, 2023.

Published Book Chapters

1. Pathak, Ketki C., Jignesh N. Sarvaiya, and Anand D. Darji. "Enhanced Hierarchical Prediction for Lossless Medical Image Compression in the Field of Telemedicine Application." *Biomedical Signal and Image Processing with Artificial Intelligence*. Cham: Springer International Publishing, 207-229, 2023.
2. Raj Shah and Rasika Dhavse, "CMOS Compatible Single-Gate Sigle Electron Transistor (SG-SET) Based Hybrid SETMOS Logic", in Nanoscale Field Effect Transistors: Emerging Applications Edited by Ekta Goel and Archana Pandey, Bentham Books, pp 139-156, Dec 2023, DOI 10.2174/9789815165647123010010
3. Raj, R., Kumar, A., Mandloi, A., Pal, R., “Applications of Machine Learning and 5G New Radio Vehicle-to-Everything Communication in Smart Cities” in *Internet of Everything for Smart City and Smart Healthcare Applications. Signals and Communication Technology. Springer,* 2023. doi.org/10.1007/978-3-031-34601-9_5.
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Sponsored Research Projects

The details of Research Projects sanctioned during 2023 is as follows:

1. Department of Electronics Engineering was awarded a Research Project of approx. Rs. 1 crore entitled 'Development of logistics use case under 5G use case lab initiative' funded by the Department of Telecommunications. The team members are Prof. U. D. Dalal (PI) and Co-PIs are Dr. Shilpi Gupta, Dr. Shweta N. Shah, Dr. Raghavendra Pal, Dr. Suresh Dahiya and Dr. Sankita Patel.
2. Dr. Anand Darji was awarded by a funded research project entitled 'Onboard spectra preprocessing for multispectral image compression using FPGA' of Rs. 18.62 Lacs by ISRO-RACS.
3. Dr. Rasika N. Dhavse and Mr. Shubham Anjankar were awarded by a funded research project entitled 'Synthesis and analysis of capacitive sensor for ionizing radiation detection' by NUP-i2i, MeitY, GoI.
4. Dr. Shilpi Gupta was awarded by a funded research project entitled 'Polarization Tunable Circularly Polarized Antenna with Graphene for Ka-Band applications' of Rs. 71,500 by SAC ISRO, Ahmedabad.
5. Dr. Raghavendra Pal, Dr. Suresh Dahiya, Dr. Dipti Rana and Dr. Anand Darji were awarded by a funded research project of Rs. 2.5 Lacs entitled 'Compact Formation based swarming drone for coordinated surveying', funded by Meity.
6. Dr. Suresh Dahiya, Dr. Dipti Rana and Dr. Anand Darji were awarded by a funded research project of Rs. 2.5 Lacs entitled 'PoC of Agriculture drone for precision farming',
7. Dr. Suresh Dahiya and his student team were awarded by project of Rs. 1.5 Lacs entitled 'Pesticide spraying farming robot' by Gujcost.
8. Dr. Vivek Garg, Dr. Deepak Joshi, Dr. Nithin Chatterji and Dr. Abhishek Acharya were awarded by a funded research project of Rs. 11 Lacs entitled 'Design and Fabrication of BiOI based Indoor Photovoltaic Devices for Development of Self-Powered IOT Ecosystem', funded by i-Hub Divyasampark.
9. Dr. Abhishek Acharya was awarded by a funded research project of Rs.22 Lacs entitled 'Design and Characterization of Radiation Hardened Standard Cell Library using Nanosheet FETs: Improving on Design Margins/ Reliability' by SERB under CRG category.
10. Dr. Deepak Joshi, Dr. Vivek Garg, Dr. Suman Deb and Mr. Shashidhara M were awarded by a funded research project of Rs. 11 Lacs entitled 'Design, Fabrication and Characterization of optimized 2D-Material SOT-MTJ for Energy Efficient Embedded Memory (MRAM) / Sensing Applications', funded by iHub Divyasampark.
11. Dr. Kamal Captain, Dr. Deepak Joshi and Dr. Suman Deb were awarded by a funded research project of Rs. 11 Lacs entitled 'Machine Learning based Mobile Application for Early Shrimp Disease Diagnosis in Aquaculture', funded by iHub Divyasampark.
12. Dr. Kirti Inamdar and Dr. P. V. Bhale were awarded funded research project of Rs. 24 Lacs entitled 'Design and Development of Sustainable, Light-Weight, Cost-Effective Biochar-Polymer based Composites as Electromagnetic Shields for preventing the hazardous EMI Effects in Different Electromagnetic Environments' by SERB under CRG category.

OTHER ACHIEVEMENTS

Expert Lectures delivered:

1. Prof. U. D. Dalal was invited for a talk in 12th ICCCAS 2023 held in NTU, Singapore.
2. Dr. Rasika N. Dhavse was invited as a speaker in the 10th Annual Conference of Nano Science and Technology-2023 (Nano S&T -2023) in BITS World Congress, Osaka Japan in May 2023.
3. Dr. Zuber M. Patel delivered an Expert Lecture on 'Embedded Systems: Technology and Trends' at MIT - ADT University, Pune on 25 March, 2023.
4. Dr. Shweta Shah delivered an expert talk on 'Anti-Drone Techniques: SpoofifTCng and Anti-spoofing' in the bootcamp Drone Assembly, Navigation, and Applications being organized from 8-12 April 2023 at DoECE, SVNIT.
5. Dr Shweta Shah delivered an expert talk on Research databases, Publications and Research metrics at Parul University on 29-4-2023.
6. Dr. Shweta Shah delivered an expert talk on No G to 5G: milestones in Telecom Evolution organized by the Institute of Engineers (Maharashtra state center), in association with Nasik local center & SHHJB polytechnic, Chandwad.
7. Dr. Raghavendra Pal delivered an expert lecture titled 'Future trends of IoMT in smart healthcare system' in Poornima institute of Engineering and Technology, Jaipur on 16 December, 2023.
8. Dr. Suresh Dahiya delivered an expert lecture on 'Basics of Drones' in MeitY sponsored Bootcamp 1.0 held during 8-12 April 2023 at DoECE, SVNIT, Surat.

Workshops Organized

1. 8 days Karyshala on "Hands on Training on Design, Fabrication and testing of 5G Antenna using Machine Learning" funded by SERB was organized during 12-19 May 2023. The coordinators were Dr. Shilpi Gupta and Dr. K. P. Upla.
2. One-week Faculty Development Program Boot Camp 2.0 on "Drone Applications" was organized during 26-30 June 2023. The coordinators were Dr. Dipti P. Rana, Dr. Anand Darji, and Dr. Suresh Dahiya.

Outreach Achievements

1. Dr. Rasika N. Dhavse acted as a Session Chair in PCEMS 2023 held in VNIT Nagpur in April 2023

Patent

Dr. J. N. Sarvaiya, Prashant Kumar Pandey and Dhaval Vora received an innovation patent entitled *A System for Compression using Variable Entropy Method*.

STUDENT CORNER

- Ph.D. Completion
- Student Activities under Technical Chapters
- Details of Student Internship and Placements
- Alumni Interview
- Creative Corner

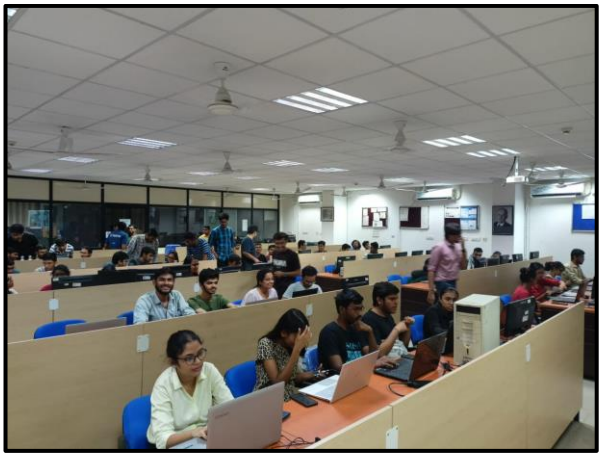
Ph.D. AWARDEES FOR THE YEAR 2023

Sr. No.	Name	Roll No.	Title	Date of Completion	
1.	Mr. Tiwari Pradeep Deenanath Vijaylakshmi	DS17EC007	Multimodal Stress/Emotion Recognition Techniques based on Dynamic Feature Extraction from Video Clips	5th January, 2023	
2.	Mr. Abhishek Tripathi	D17EC002	Performance Analysis of Hybrid Free Space Optical Communication System under Atmospheric Conditions	19th January, 2023	
3.	Mr. Solanki Miteshbhai S.	DS16EC001	Performance Analysis of conjugate Gradient Based Detection Schemes for Massive MIMO System	20th March, 2023	
4.	Mr. Dhiraj Kumar Patel	D17EC005	Investigation of Forward Error Correction Enabled Free Space Optical Link for High Data Rate Transmission	31st March, 2023	
5.	Mr. Gheewala Shaileshkumar Mahendralal	DS14EC004	Development of Porous Silicon Structure by Pulsed Fiiber Laser for Capacitive Sensing Applications	26th June, 2023	
6.	Mr. Sagar Pareshkumar Ramanbhai	D18EC002	Design, Fabrication & Testing of ENG Metamaterial Based Microwave Devices for Soil Characterization by Dielectric Measurements	9th August, 2023	
7.	Ms. Ramya R.	D18EC001	Investigations & Implementation of Circularly Polarized Slot and Fractal DGS Antennas for Sub 6 GHz Applications	11th August, 2023	
8.	Mr. Prajapati Priyankkumar Hargovindbhai	D17EC004	Hardware Efficient Artifact Suppression of ECG Signal Acquired Using Wearable Biomedical Devices	21st September, 2023	

9.	Ms. Gandhi Divyangna Navinchandra	DS16EC002	Flat-Gain Optimization of EDFA and EYDFA with Long Period Fiber Gratings for DWDM System	27th December 2023,	

IEEE STUDENT CHAPTER

IEEE student chapter did four major hands-on workshops this year, Introduction to Arduino board on 15/2/23, game development using Machine learning (ML), Artificial Intelligence (AI), and Magic layout software on 20/2/23. The workshops were organized for B.Tech. and M.Tech. (Magic layout) students, immensely benefiting the participants. These workshops were done to introduce them to power of AI and ML and with the help of gamified Scratch software, six games were developed in 90 mins of session where they got deep insights of both AL and ML technologies. Some glimpses of the events are shown below.



IETE Student Forum

Sr. No.	Details of Activity	Date held
1	Run with Maths: A treasure hunt event under Hertz 8.0	29th January 2023
2	Mock Placement under Hertz 8.0	26th and 28th January 2023
3	Flip Flop: A debate competition under Hertz 8.0	27th and 28th January 2023
4	Quiz Battles: Quiz competition under Hertz 8.0	28th January 2023
5	IETE Student Day celebration	3rd February 2023
6	Women Empowerment program by IETE Surat Sub-center in association with ISF, SVNIT, Surat A series of events were conducted under this section. 1st Program: An expert talk by Dr. Chintan Pathak on the topic: Women Internet Safety Education: Need of the Hour for Digital India.	3rd February 2023 6th February, 2023

	2nd Program: Poster Competition: ARTFIESTA: Women Empowerment Poster making competition. 3rd Program: An online coding quiz competition for girls 'Women in Tech' was conducted.	5th February, 2023 Results were declared on 6th February
7	ISF SVNIT conducted the event INNOQUEST under Sandeep Memorial Project based Competition (SMPC). The event was about presenting the startup idea	25th March, 2023
8	ISF SVNIT organized an Extempore as a part of S.M.PC. The event was open to all years and branches.	25th March, 2023
9	ISF SVNIT organized an expert talk on Wearable Technologies for Smart Healthcare: Applications and Challenges	17th October 2023

Some glimpses of the event are shown below:

INTERNSHIP DETAILS

Name	Company
Bhargav Prajapati	Marvell Technology
Kanhaiya Lal	Amazon
Hanumanthu Vinitha	Barclays
Kajal Jaiswal	Marvell Semiconductors
Himanshu Soni	JP Morgan Chase & Co.
Sharma Himanshu Ranjan Pankajkumar	Barclays
Priyam Bhimani	Marvell Technology
Tushar Keshari	Mastercard
Khushi Solanki	JP Morgan Chase & Co.
Chakshu Gupta	GE Healthcare
Arpit Jain	Mastercard
Raj Modh	JP Morgan Chase & Co.
Vandita Rawat	GE Healthcare
Duddekunta Devamani	JP Morgan Chase & Co.
Rohit Patil	JP Morgan Chase & Co.
Jinhal Maheshwari	J P Morgan Chase & Co.
Bendke Srushti Sangharsh	Barclays
Aditi Laddha	JP Morgan Chase & Co.
Sreeharini Mattegunta	John Deere
Shivang Sharma	John Deere
Jagrit Joshi	National Physical Laboratory, New Delhi
Kavish Gajjar	Workwell Engineers
Dev Desai	IIT ROORKEE
Ritik Nama	IIM Vishakhapatnam

OTHER ACHIEVEMENTS

Name	Achievement
Bhargav Prajapati	Competed professionally in Esports for H20 Officials, achieving victories in various national and college-level gaming competitions, including PMIT and PMIS (Pubg Mobile India Tour/Series).
Harshil Mistry	Participated in an innovation based project competition by Samsung Solve For Tomorrow, a CSR initiative by Samsung on Beach Cleaning Robot which collects the wastes on beach, segregates it into plastic and non-plastic and disposes off. He and his won that competition and were there in top 3 teams. They received a funding of 50 lakhs.
Aditi Laddha	National Basketball player and played inter NIT.
Anagha Mathkari	Won 3rd prize in shrutilekhan competition of Hindi cell SVNITand 1st prize in slow cycle in class 9th,10th and 11th
Vatsal Margi	Dancer of the year- (SSNG- Bhilad), Boogie Woogie - finalist(Anand), Winner - Folk singing competition (SVNIT , IIIT Surat), 2nd runner up- ENCORE singing competition SVNIT
Rahul Mavaliya	National Bronze Medalist in Wushu Kung Fu and National Volleyball player
Mihirkumar Solanki	Cricket player state level
Varun Modi	Selected for the 2023 Certified Cybersecurity Technician (C|CT) Scholarship by EC-Council
Harshit Pathak	TOSC Techkriti - till final round held at IIT KANPUR
Anushka Choudhary	Won 5th prize in open mic(Hindi pakhwada ,SVNIT), 3rd prize in open mic during youth day(FEV, SVNIT), 3rd prize in book review (Hindi pakhwada,JNV), represented SVNIT at IIT GANDHINAGAR by participating in nukkad natak and won second runner up position, participated as youngest poet in the poem collection book named "Jasvatika"
Gargi Eran	Got Second prize in national drawing competition Dancing App development
Myla Venkata Prasanth R	Inter NIT kabaddi player, Zonal level Kabaddi Player, Achievement in Professional cricket
Jadi Aishwarya	Participated in Literacy competition at state level

TREE NUMBERING ACTIVITY BY FINAL YEAR PASSING OUT BATCH 2023

Our students participated in the tree numbering activity conducted by Garden and Campus Beautification Section of the institute. They put number on nearly 300 trees covering staff club, Director bungalow, A&B type faculty quarters, and central lawn area. They enjoyed the activity immensely and took it as one of the sweet memories of their mentor institute.

ALUMNI INTERVIEW

Mr. Vish Thirumurthy holds a bachelor's degree (B.E. ECE) from S.V. NIT, Surat, a master's degree (M.S. in Electrical & Computer Engineering) from Rose-Hulman Institute of Technology in Indiana USA, and an MBA from the University of Colorado, USA. He enjoys operating at the intersection of technology innovation, customer experience, and entrepreneurship. Vish is driven by solving big complex problems sustainably by applying digital, cloud, Ai, hardware, and other industry 4.0

He served for over a decade as a global senior executive at Microsoft Corporation HQ USA. Subsequently, he made the move to pursue his entrepreneurial dream. He is currently the Founder & Chief Executive Officer of Tev5. Over the course of his career, Vish has launched and managed 200+ technology products. He has been a speaker at global industry events, AR/PR spokesperson, and featured in both online and print media. Vish is the published author of "Defining Customer Care", co-authored with Dr. Jon Anton, Purdue University USA.

https://www.linkedin.com/in/vthirumurthy

1. What are the things you fondly remember about our department?

   It truly was my first time away from home, and many things to fondly remember as I think back about 30 years!

   - The Professors and teachers who helped begin my academic journey.
   - The ECE classes, my first introduction into the fascinating world of electronics, communications, digital computers, and computer science.
   - Extra academic learning through project and seminar. Working under the guidance of department professors but also collaborating with the industry, a wonderful learning experience.

2. What is something at SVNIT that you absolutely loved being a part of?

   Being a part of the rich and diverse student community. Making friends with students from almost every state in India, most of those friendships endure even today, thanks to our big and active WhatsApp group.

   Discussing topics from sports, politics, religion, food, exams, to anything and everything under the sun. And all the rich activities with my friends – sports including cricket, volleyball, carrom; cultural events like garba, funfair, movie night; going out to Surat city with friends group.

3. If you were now in your first year of college what are the things that you would like to explore?
   I would spend more time developing and building my computer skills – software development in writing small apps to solve problems for the things that I see around me in the department, friends, family, home, and community. This enables learning and practice on how to apply academic learning to solve practical everyday problems quickly.

4. How did your experience at SVNIT help you find your first position after graduation?
   Earning that B.E. ECE degree at SVNIT - with all the courses and labs related to ECE and other disciplines and the other soft skills I learned – was very foundational in being able to qualify for a master's program in a US university. The REC/NIT college system is recognized by American universities without requiring additional credential evaluation process.

5. Do you admire any famous personality? What is it about them that you look up to?
   While there are many people whom I admire and from whom I take inspiration, Steve Jobs during his time at Apple Computer, designing amazing functional, usable, and aesthetic products with the mindset of an engineer and the heart of an artist is certainly up there in my list.

6. Any tips for freshies for surviving and going big in this cutthroat competition in the industry?
   Aim higher to think about thriving, and you should be set for survival also. Importantly, always seek to differentiate yourself from the crowd! You cannot remain average and hope to thrive. Not everyone will get opportunities, so your approach should be to standout from the crowd in a good way, so you are best positioned to see opportunities open in front of you.

7. Now a days there are many online certifications courses for AI, IoT and sustainability. In your opinion, how these courses would help the students in terms of their technical upgradation?
   It is excellent to augment/upgrade your college learning with these online courses in Ai, IoT, sustainability, robotics, mechatronics, etc. Key thing to keep in mind is that the course(s) you select have a good mix of theory and practical. While there are exceptions, pure theory is less useful in the real world where it is important to know the theory behind a concept or piece of technology, but equally important to practice applied engineering where you can solve real problems using that knowledge. Additionally, it is important to keep upgrading and learning throughout your career, not just as a fresher.

8. What other things does a fresher need to keep in mind in order to last long and sustain in the industry?
   Be curious and be learning continuously at any stage in your career. You must always stay current and relevant since technology & engineering are fast-growing fields. Keep up with R&D updates, business news reports including mergers & acquisitions, top companies in your field, investments being made, etc.

9. Next decade is being called the decade of semiconductor electronics, what do you think freshers in the domain need to learn to thrive in the field?

Smart and connected technology is everywhere. Any and all devices, products, buildings, automobiles are being connected to the Cloud. Robots and cobots will become ubiquitous in their contribution to bettering human society. Ai will be all pervasive as it augments human intelligence with artificial intelligence. *Semiconductors power all of this!*

Freshers in this domain wanting to thrive should:

- Learn the current state of the art of semiconductor theory.
- Know that semiconductors need to evolve rapidly to become faster, cheaper, better.
- However, we are reaching the limits of the current semiconductor technology in terms of miniaturization and performance. So next continuum shift in semiconductor technology is just around the corner – read up on Quantum computing. Keep your eyes on companies building quantum computers.
- India will be increasing the semiconductor investment since we are behind, so there will be opportunities for you in jobs and startups.

10. In the end, any advice to our readers out there from our college or beyond who want to have their own startup?

    The foundational thing is to have a DREAM and the courage to pursue it. And then, in my personal experience and opinion as a serial entrepreneur, here are the skills anyone must develop to successfully found, lead, and grow a startup:

    - Personal Attitude: Learn to become purposeful, relentlessly focused, hardworking, passionate, positive, and mentally tough.
    - Technical Breadth and Depth: Develop sound fundamentals (theory and practical) in the chosen domain in which your startup will offer a product or service.
    - Industry Expertise: Expertise in different industry verticals or your target industry vertical. This is where your customers will be, so you must understand what exact customer problem(s) you are going to solve.
    - Business Fundamentals: To be successful, the startup must be built on sound unit economics, financials, forecasts, budgets, cash flow, raising capital, etc.; all elements of a good business plan and execution plan. Therefore, be sure to learn at least the basics of business principles so you can steer your startup well.
    - People Skills: You will work with customers, partners, employees daily in your startup. Be sure to develop the needed skills including communication, negotiation, leadership, and management.

    Finally, I do look forward to being connected with some or many of you. Feel free to connect with me on LinkedIn (https://linkedin.com/in/vthirumurthy). I am typically selective in accepting connect requests, so please be sure to mention in your connection request message that you are from SVNIT. Best wishes on your own personal journeys through SVNIT and beyond!

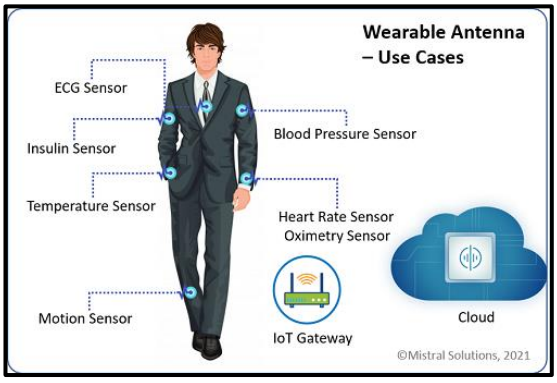
Vish Thirumurthy
B.E. ECE, SVNIT
Class of 1991

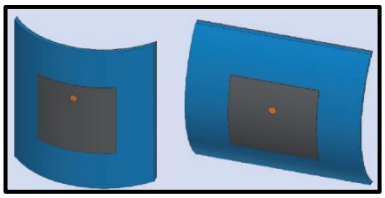
CREATIVE CORNER

E-Textile Antenna Based Biosensor

In an era where connectivity is essential, textile antennas have emerged as a groundbreaking solution, seamlessly merging technology with everyday fabrics. These antennas represent a unique intersection of fashion and functionality, enabling the creation of smart clothing, accessories, and wearable devices that offer both style and connectivity. This article explores the exciting domain of textile antennas as sensors and their applications in the biosensor field.

A textile antenna-based biosensor is a specialized biosensor integrated into fabric or textiles for wearable applications. These sensors combine the principles of textile technology and antenna-based biosensing to enable real-time, non-invasive monitoring of biomarkers and physiological parameters. They have gained significant attention in the fields of healthcare, fitness tracking, and remote patient monitoring. These biosensors operate on the principle that the presence of target biomolecules or analytes can cause changes in the electromagnetic properties of the sensor, which can be detected and measured.





From Fibers to Frequencies: How Textile Antennas Work

Textile antennas function on the same principle as traditional antennas: they send and receive electromagnetic waves, facilitating wireless communication. What sets textile antennas apart is their integration directly into fabrics, making them virtually invisible to the eye and woven seamlessly into our lives. The integration process involves embedding conductive materials, often metallic threads or conductive inks, into the fabric's weave or structure. These conductive elements serve as the antenna's radiating element, while the fabric itself acts as a substrate and supports the antenna's design. The result is an unobtrusive yet effective antenna that blends in with everyday clothing and accessories.

Here's an overview of how textile antenna-based biosensors work and their key features:

1. Integration with Textiles: Textile antennas and biosensors are seamlessly integrated into clothing or fabrics. This integration involves incorporating conductive materials, such as

conductive threads, metallic yarns, or conductive ink, into the textile substrate to create the sensor elements.

2. Recognition Molecules: Similar to traditional antenna-based biosensors, recognition molecules (e.g., antibodies, aptamers, or DNA probes) are immobilized onto the textile surface. These molecules selectively bind to specific biomarkers or analytes.

3. Contactless Sensing: Textile antenna-based biosensors are designed to operate in a contactless or non-invasive manner. They can detect and monitor analytes without the need for blood samples or direct skin contact. For example, they can sense biomarkers from sweat, saliva, or other bodily fluids in proximity to the textile.

4. Data Transmission: Many textile biosensors are equipped with wireless communication capabilities. They can transmit data to a nearby receiver or a smartphone via Bluetooth, Wi-Fi, or other wireless protocols, allowing for real-time monitoring and data analysis.

5. Power Supply: Textile biosensors may have integrated power sources, such as thin, flexible batteries or energy-harvesting mechanisms, to enable continuous operation.

6. Washable and Durable: To ensure usability and comfort, textile biosensors are designed to be washable and durable. They can withstand repeated washing without degrading their sensing capabilities.

Applications of textile antenna-based biosensors include:

- Health Monitoring: These sensors can continuously monitor physiological parameters like glucose levels, lactate, or electrolyte concentrations, making them valuable for individuals with diabetes, athletes, and patients with chronic illnesses.

- Environmental and Workplace Safety: Textile biosensors can monitor exposure to harmful substances or toxins in occupational settings, ensuring worker safety.

- Fitness and Sports: Athletes can use these sensors to track their performance and overall health during training or competition.

- Elderly Care: Textile-based biosensors can remotely monitor the elderly or patients with chronic diseases to provide timely medical interventions if needed.

- Military and Defense: The military can utilize these sensors in smart uniforms to monitor soldiers' health and detect potential threats or exposure to hazardous agents.

Textile antenna-based biosensors represent an innovative approach to biosensing by combining textiles and wearable technology, making them convenient, unobtrusive, and well-suited for applications that require continuous monitoring of various biomarkers and physiological parameters. In the coming years, we can expect to see even more innovative applications of textile antennas, revolutionizing industries beyond fashion and wearables. From healthcare to automotive, these antennas will redefine the way we connect and communicate, seamlessly woven into the fabric of our lives.

Fahad Bilal

Research Scholar, DoECE, SVNIT

DAISY: APPLE'S OWN RECYCLING ROBOT

With the prevalence of smartphones in today's society, the question of how many people utilize them may appear clichéd. These devices have transformed our daily lives in countless ways, from scheduling our lives to staying connected with those we cherish, and even providing limitless entertainment at our fingertips. Rather than discerning who wields these high-tech wonders, an inquiry that holds true import is how long an individual has owned their current device. The question of smartphone usage remains pertinent, but in a different manner.

The world is gradually becoming fed up with phones. Although it seems invasive to scrutinize one's phone habits, the average lifespan of a phone is usually only around 2 or 3 years. Upgrades have become nearly a reflex, but unfortunately, this is leading to an electronic waste (e-waste) crisis. Smartphone usage is especially concerning, given the fact that they account for a whopping 12% of the world's e-waste problem.

The vital elements that make up a smartphone are worth exploring. Lithium is the essential ingredient of the battery and it powers up the device. But that's just the beginning – gold plays a crucial role in the connectors and rare metals enhance the screen and other integral parts. Because of the variety of materials used in smartphone manufacturing and discarding, the effect on the environment cannot be ignored.

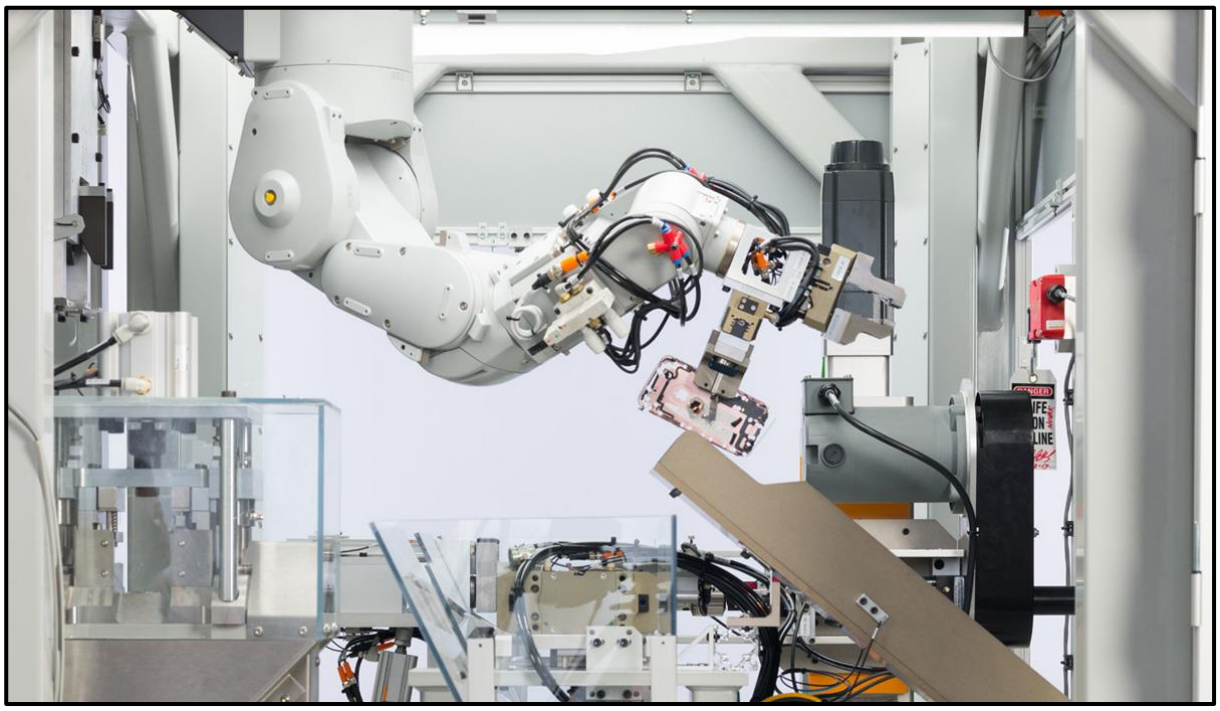
Apple, emerging as a frontrunner, makes strides towards solving e-waste quandaries. Beyond producing sleek and top-notch electronics, Apple takes its environmental responsibility seriously. One initiative that stands out is the development of a recycling robot - a prime example of their enthusiasm for technology and sustainability.

The finely-crafted Apple recycling robot illustrates the exceptional problem-solving abilities of mankind. Its extraordinary aptitude for carefully breaking down utilized iPhones and retrieving precious minerals and parts is a remarkable leap towards eco-friendly technology. Unlike any average machine, Daisy, the robot, exhibits a surgical-like precision in extracting the central logic board, an iPhone's "mind," for refurbishing and potential reuse.

Apple's Daisy robot is more than just a device dismantler. It is a symbol of a circular economy movement that aims to reduce our reliance on newly mined resources - a movement that other tech companies can follow. By repurposing materials, Daisy sets an example for everyone to emulate and provides an environmentally friendly alternative to the resource-intensive mining industry. The recycling robot's incredible accuracy and efficiency allow it to dismantle devices with ease and minimize the ecological impact of manufacturing new products.

The grave environmental threat posed by the growing pile of electronic waste generated by our dependence on smartphones cannot be ignored. Despite its short life cycle, the consequences are far-reaching. Nevertheless, companies such as Apple prove that progress and environmental awareness can go hand in hand. Daisy, the recycling robot, serves as a bright light indicating that sustainable solutions are not only necessary, but possible.

Emerging as the epitome of sustainable development in the digital realm, Apple's Daisy is the embodiment of progress. As we navigate this era of technological advancement, we must remain cognizant of the far-reaching impact of our consumer choices on the planet. The world observes the dynamic interplay between the environment and technology, and Daisy represents a glimpse into a future where innovation and environmental stewardship coexist harmoniously.



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