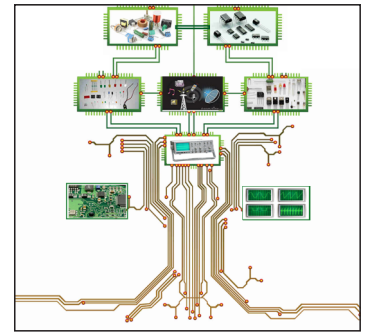


ELECTRONICA

Newsletter

Department of Electronics & Communication
Engineering



Volume 7

Issue 2

Jan - June 2022

Vision and Mission of the Institute

Vision

- To be one of the premier Institutes of Engineering and Management education in the country

Mission

- To provide Engineering and Management education that meets the needs of human resources in the country
- To develop leadership qualities, team spirit and concern for environment in students

Objectives

- To achieve educational goals as stated in the vision through the mission statements which depicts the distinctive characteristics of the Institution
- To make teaching-learning process an enjoyable pursuit for the students and teachers

Vision and Mission of the Department

Vision

- To be a renowned department for education in Electronics and Communication Engineering in Karnataka State, moulding students into professional engineers

Mission

- To provide teaching - learning process in Electronics and Communication Engineering that will make students competitive and innovative to adapt to needs of industry and higher learning
- To imbibe professional ethics, team spirit and leadership qualities to succeed in changing technological world
- To inculcate empathy for societal needs and concern for environment in engineering design and practice

Program Education Objectives

After 2 to 3 years of graduation, the students will have the ability to:

- Analyze, design and implement solutions in Electronics and Communication Engineering and adapt to changes in technology by self/continuous learning
- Engage in higher learning and contribute to technological innovations
- Work with professional ethics as an individual or as a team player to realize the goals of the project or the organization
- Work with respect for societal values and concern for environment in implementing engineering solutions



This edition of Electronica is dedicated to Alain Aspect who is awarded the 2022 Nobel Prize in Physics for his experiments with entangled photons, establishing the violation of Bell inequalities and pioneering quantum information science. Alain Aspect conducted groundbreaking experiments using entangled quantum states, where two particles behave like a single unit even when they are separated. The results have cleared the way for new technology based upon quantum information.

What's inside...

- Articles
- Crossword
- Department Events
- Student Achievements
- Staff Achievements

And more...



Vidyayāmruthamashnuthē

B. N. M. Institute of Technology

An Autonomous Institution under VTU. Approved by AICTE.

Post box No. 7087, 27th Cross, 12th Main, Banashankari 2nd Stage, Bengaluru- 560070, INDIA

Ph: 91-80- 26711780/81/82 Email: principal@bnmit.in, bnmitprincipal@gmail.com, www. bnmit.org



FROM THE EDITORS' DESK

“The more that you read, the more things you will know. The more that you learn, the more places you'll go.”

-Dr. Seuss

The editorial team deems it an honor to welcome the readers to yet another informative edition of the department Newsletter ELECTRONICA Volume 7, Issue 2, Jan-June 2022. When learning is purposeful, creativity blossoms; when creativity blossoms, thinking emanates. ELECTRONICA is one such paragon that is unfolded by the thinking minds of the department unveiling the creativity within. The Newsletter is being crafted with informative articles, events conducted, and the achievements of students and teaching staff of the department. ELECTRONICA has been the best platform for innovative minds to exhibit their prolific work and has helped them to step up and initiate their research. It helps them explore innovations and to even find their undiscovered interests by fueling their curious minds.

We owe our thanks to all the writers whose informative articles and ideas have kept the readers hooked. We are indeed indebted to our reviewers who spared their valuable time and contributed towards this academic endeavor. We sincerely hope that the readers will find the articles interesting and intellectually stimulating.



Editorial Team

ABOUT THE DEPARTMENT

The Department of Electronics and Communication Engineering started in the year 2001. The department has two programs: B.E. and M.Tech. (VLSI Design and Embedded Systems), affiliated with VTU. The department also has a VTU-recognized research centre and offers Ph.D. program. Many researchers pursue their doctoral programs and in this research center, presently there are eleven registered candidates. The department has a team of highly qualified and dedicated staff with teaching, research, and industrial experience. Well-equipped laboratories with state-of-the-art infrastructure and classrooms with LED projectors provide an enhanced learning environment to cater to the needs of the prodigious engineers of tomorrow. Most of the lectures and practicals are video recorded and are made available to the students through an online platform, the BNMIT VROOK learning management system. Our students have performed excellently in academics and hence secured seventeen university ranks since 2005. The students do innovative projects, internship training in industries, and academic projects in reputed organisations. They regularly participate in inter-college and intra-college technical, cultural, and sports events and have regularly brought laurels for the department. The students participate in hackathons, workshops, webinars, and quizzes, present papers at reputed conferences, and publish papers in reputed journals. Webinars and workshops are conducted using online platforms (Microsoft Teams) and in offline mode. Faculty Development Programs, Workshops, Skill Development Programs, Seminars, and Invited Talks for students and staff are organized for continuous learning and periodic updation of knowledge and skills

Dr. P. A. Vijaya
Professor & Head, Dept. of ECE

TECHNICAL ARTICLES

Blockchain Technology for Startups

Blockchain technology brought with it new ways for startups to get a good start and for already existing companies to improve. Blockchain technology is not accepted worldwide and still faces opposition from some parts of the world. However, looking at the rise of cryptocurrencies like Bitcoin and Ethereum, most companies changed their minds and looked towards Blockchain technology for solutions to some of their problems. In this article, we will look at how Blockchain technology can be used by startups.

Using Cryptocurrencies for Exchanges

The conventional method is to use the native currency for exchanges of any kind. Instead, introducing cryptocurrencies as an option for exchanges is a good idea. Along with the conventional method, this is an additional method for people who wish to use their cryptocurrency. Bitcoin and Ethereum are already being accepted by several companies. Using Bitcoin has the following advantages: (1) The value of Bitcoin constantly rises, so the company keeps profiting from the exchange. (2) The fees involved in payment via Bitcoin are very less, and it is an easy process too. Companies like Tesla, Badoo, etc. accept Bitcoins. Ethereum makes use of something known as smart contracts. Smart contracts are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code. If a startup requires some help regarding the transaction of any kind of currency, which is based on a certain set of rules, then Ethereum smart contracts are the best for them. Smart contracts are very flexible as they can be programmed, and their use depends on the company. There is no universal smart contract as such. Bitcoin and Ethereum are the most preferred cryptocurrencies for any transactions to be done. However, a company can introduce a few other cryptocurrencies. But having many cryptocurrencies as alternative methods can also be problematic, as the maintenance will be difficult.

Initial Coin Offering

Initial Coin Offering (ICO) was introduced in 2017 as a method for startups to use Blockchain Technology. Before this, startups would look for venture capitalists to fund them. This method involves a lot of friction and discomfort for startups. The venture capitalists hold a stake in the company and can withdraw at any time they want to. This method also included giving away confidential information to venture capitalists. With the use of ICOs, the company creates a token, which can be bought by investing in it using Bitcoins or Ethereum. This allows startups to make millions of dollars in just minutes. This system is advantageous because the money is obtained quickly, sometimes more than what is required. Also, the company does not have to give away any confidential documents or information to the public.

The tokens created by the company increase in value with time as more people buy them. When the project is a success, it is a win-win situation for both the company as well as the investors. Companies such as Filecoin and Tezos came up with the help of ICOs. It should be noted that ICOs are not only for startups. It is better to invest in ICOs by companies that have existed for some time.

Otherwise, there is a high risk of loss. Not that the project of a well-established company will always be a success, but the probability of success favors the long-standing companies.

Security

Blockchain technology is also a safe mode for transactions. It uses cryptographic algorithms like SHA256 and Scrypt for securing transactions. The concepts of Blockchain technologies can be used for protecting online transactions, and even any kind of communication. With the use of this technology, the contents to be transferred over the network are encrypted before they ever touch the network. Kodak introduced the KODAKOne platform which helps photographers fight against the theft of their photographs, and also earn by selling their photographs. Startups can take ideas such as this into account and increase the security they provide to their customers.

Blockchain technology is still to be experimented with. The idea of cryptocurrency as a source of entertainment can



Figure 1: Blockchain technology

be seen in CryptoKitties. Thus, a lot of exploration is yet to be done in this field. Startups are now free from venture capitalists and can use the technology for other useful purposes too. The future of Blockchain technology can do wonderful things for entrepreneurs too. So, if you're an entrepreneur or plan to be one soon, keep an eye on the advancements in this world!

Source:

<https://www.forbes.com/sites/amycastor/2017/08/15/researchers-find-issues-with-0x-the-latest-ethereum-based-project-aiming-to-raise-millions-in-an-ico/#159d13c647c7>

Tejas R Simha

Alumnus (2015-2019 Batch)

AI Engineer, Inflect Technologies Pvt Ltd

5G AND IOT

5G and IoT technology are more than just a new generation of wireless technology. It represents a fundamental change in the mobile ecosystem, unleashing a powerful combination of extraordinary speed, expanded bandwidth, low latency, and increased power efficiency that is driving billions of more connections in the next five years and changing our world.

How did 5G come about?

The first iteration of wireless technology, 1G, cut the cord for voice calls ushering in a new age of mobility. When 2G emerged supporting voice and data, machine-to-machine communications (M2M) enabled simple solutions such as telematics, remote monitoring and control, and more. When 3G evolved, web-browsing greatly expanded possibilities for the IoT, and invention took off. Along came higher-speed data and video streaming of 4G along with the advent of cloud computing. This unleashed a tidal wave of imagination and innovation that demanded higher bandwidth, greater capacity, stronger security, and continuous connectivity with lower latency.

What does 5G mean for IoT?

It's a game-changer! 5G enables faster, more stable, and more secure connectivity that's advancing everything from self-driving vehicles to smart grids for renewable energy to AI-enabled robots on factory floors. It's unleashing a massive IoT ecosystem where networks can serve billions of connected devices, with the right trade-offs between speed, latency, and cost. 5G got its start when the International Telecommunications Union (ITU) identified minimum recommendations for a new technology that was further defined and standardized by the 3rd Generation Partnership Project (3GPP). Thales has taken a leadership role in getting 5G off the ground.

How does 5G work?

There is much that sets 5G apart from anything the world has seen before, but arguably the most significant is how it leverages the frequency spectrum. To deliver ultra-high speeds with the lowest latencies, 5G networks leverage radio

frequencies in two groups: FR1, also called the sub-6 GHz range and FR2 between 24 and 52 GHz. The latter, FR2, extends into the extremely high frequency (EHF) range, also known as millimeter wave (mmWave) frequency.

5G IoT Today

Currently, the world has over fourteen billion IoT devices. These devices have a significant impact on our economy. The IoT applications and use cases have improved the standard of living. Home automation gives people more time to focus on their jobs. They can do chores quickly. For example, consider an automatic vacuum cleaner programmed to clean houses at a specific interval. People no longer have to spend their valuable time doing that. That can make them more productive. The automation of production lines using private 5G IoT networks can improve productivity and reduce costs.

That will make commodities cheaper, impacting the economy.

Source:

<https://www.thalesgroup.com/en/markets/digital-identity-and-security/iot/resources/innovation-technology/5G-iot>

Sushmitha S T T

VI ECE B

Solar Tracking using Photodiodes, Transistors, and Sun Sensors

Photodiodes and Transistors in Solar Tracking

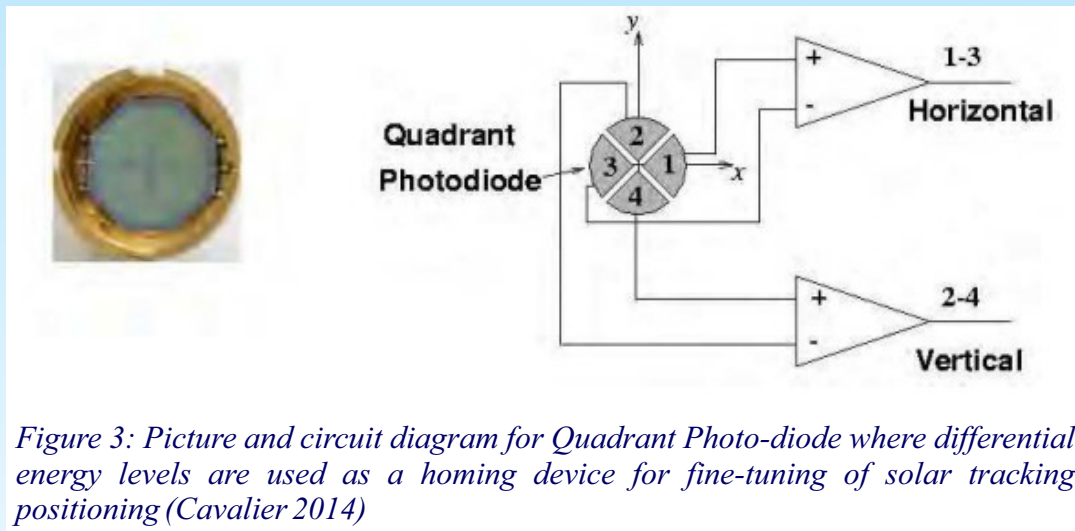


Figure 3: Picture and circuit diagram for Quadrant Photo-diode where differential energy levels are used as a homing device for fine-tuning of solar tracking positioning (Cavalier 2014)

Photosensitive devices and the principles behind their operation are commonly used in closed-loop control for solar tracking systems. In these solutions, light-sensitive sensors or infrared detectors can be employed either to autonomously direct sun tracking or to finetune the positioning of the parabolic dish. In general, differential signals from these devices are used in output balancing circuits

to compensate for differences in component characteristics or changes in light sensitivity levels. In some solar tracking designs, dual-angle tracking is accomplished with optical slot photo-diode sensor arrays which are used to detect whether a solar dish has been oriented toward the solar home position. These photodiode homing sensors are typically mounted on the parabolic dish structure to assist with feedback to the control mechanism for adjusting the dish collector to a position directly facing the sun. Phototransistors have the added benefit. They can be connected in current circuits to drive the servo motors, thereby physically commanding the drives which direct the parabolic dish mechanism. The given circuit diagram shows interfacing a quadrature photo-diode matrix with a solar pointing controller. The quadrature matrix nature of the photodiode is obtained from monolithically integrating four photo-diodes on a common silicon photosensitive substrate.

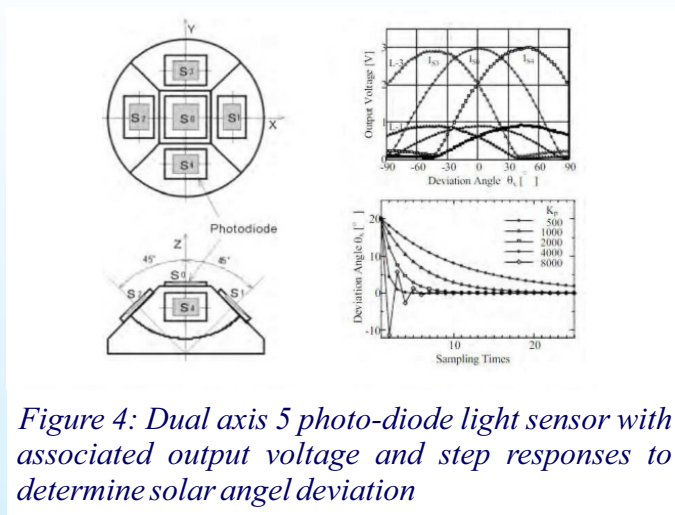


Figure 4: Dual axis 5 photo-diode light sensor with associated output voltage and step responses to determine solar angle deviation

Photo-diodes used in solar tracking are embedded into a sensor housing which may either cause shadow or illumination signal principles as input signals to steer the parabolic dish mechanism. In general, this is referred to as solar tracking with homing capabilities. A device designed by Pattanasethanon uses shade screens as a solar angle detector in which a phototransistor configuration is used as input to a logic circuit to detect solar beam radiation through which a dual-axis feedback signal is obtained. In an improved design, Shibata and Tambo (Toyokazu, 2000) from the University of Toyama in Tokyo proposed a “Dual Axis 5 Photo-Diode” sun sensor to control a solar cell platform. In their design, sun tracking is accomplished with an odd number of photodiodes attached to a frustum of a mechanical pyramid structure as illustrated in Figure 4. The difference signals from the

angular diodes due to any angle differences in the incident light are used for solar tracking. This design provides a slight improvement over a similar pyramid-type photodiode design. In this mechanism increased balance of energy output and more accuracy due to the direct sun view of the 5th diode mounter at the pinnacle is obtained.

Sun Sensor in Solar Tracking

The use of sun sensors stems from the satellite and space industry where the sun vector is used in real-time to continuously determine the orientation of the satellite or spacecraft very precisely. In spacecraft and satellite body orientation, a precise sun sensor spun at a constant rate to determine the spacecraft's orientation to the sun. These sensors, designed for use in nano-spacecraft, achieve higher measurement accuracies compared to photodiodes.

In Figure 5, incident sunlight enters the sun sensor through a small pin-hole in a mask plate (giving a $\sim 50^\circ$ field of view, around four hours exposure to the sun path), where the light is exposed to a silicon substrate which outputs four signals with the horizontal and vertical incidence of light. The sun vector $SQ(\gamma_s, \theta_s)$ is then calculated through an

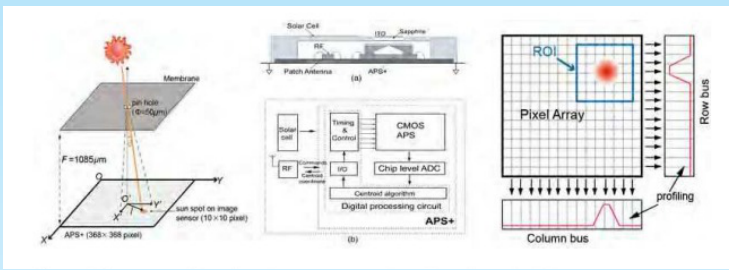


Figure 5: Determining the solar concentrator orientation using a CMOS sun sensor to compute the incident ray angle (Xie and Theuwissen, 2013)

image detector and a calibration algorithm, providing a solar vector accuracy of $\sim 0.2^\circ$.

In general, the micro-digital sun sensor can detect the angular position of the sun from the angle at which the sun rays illuminate the chip. This system-on-chip sensor is an imaging chip that integrates a CMOS active pixel sensor array of 368×368 pixels, a 12-bit analog-to-digital converter, and a digital signal processing circuit on-chip to detect sun angle orientation (Xie and Theuwissen, 2013). Figure 6 shows the more practical

side of another micromechanical sun sensor made by SolarMEMS (SolarMEMS, 2013). It shows the input and output signals from which data the sun vector is calculated in terms of the true optical azimuth and elevation angle of the sun.

One practical challenge with sun sensors in general is weather effects. These sensors have been developed for spacecraft-type applications and do pose some problems in solar tracking applications where potential dust and rain cause challenges. These sensors use a very small aperture pinhole configuration to determine the angle of the sun very accurately. This pinhole mechanism may cause the sensor to be prone to dust and rain interferences in the rough rural environmental and agricultural conditions in which a concentrated solar tracking system would typically be required to operate.

Source:

Prinsloo, G.J., Dobson, R.T. Solar Tracking. Stellenbosch: SolarBooks. ISBN 978-0-620-61576-1.

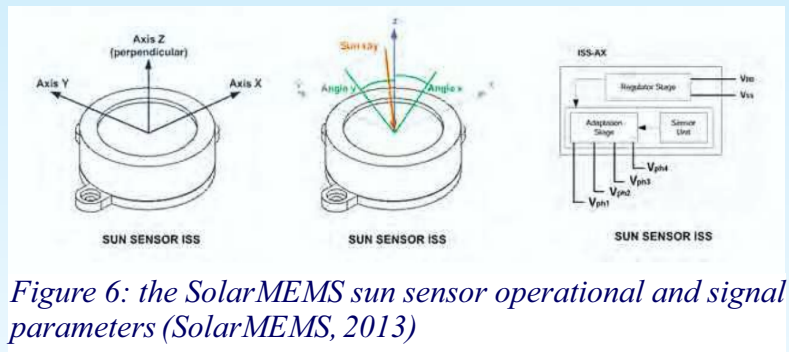


Figure 6: the SolarMEMS sun sensor operational and signal parameters (SolarMEMS, 2013)

DAC Logic Considerations

Digital-to-Analog Converters (DAC) that were available earlier were monolithic DACs that contained little logic circuitry, and parallel data had to be maintained on the digital input to maintain the digital output. Today almost all DACs are latched, and data need only be written to them, not maintained. Some even have non-volatile latches and remember settings while turned off. There are innumerable variations of DAC input structure, but nearly all are described as "double-buffered." A double-buffered DAC has two sets of latches. Data is initially latched in the first rank and subsequently transferred to the second as shown in Figure 7. There are two reasons why this arrangement is useful.

The first is that it allows data to enter the DAC in many different ways. A DAC without a latch, or with a single latch, must be loaded in parallel with all bits at once, otherwise, its output during loading may be different from what it was, or what it is to become. A double-buffered DAC, on the other hand, may be loaded with parallel data, or with serial data, 4-bit or 8-bit words, or whatever, and the output will be unaffected until the new data is completely loaded and the DAC receives its update instruction. The other convenience of the double-buffered structure is that many DACs may be updated simultaneously: data is loaded into the first rank of each DAC in turn, and when all is ready, the output buffers of all the DACs are updated at once. There are many DAC applications where the output of several DACs must change simultaneously, and the double-buffered structure allows this to be done very easily.

Most early monolithic high-resolution DACs had parallel or byte-wide data ports and tended to be connected to parallel data buses and address decoders and addressed by microprocessors as if they were very small write-only memories. Some parallel DACs are not write-only but can have their contents read as well—this is convenient for some applications but is not very common. A DAC connected to a data bus is vulnerable to capacitive coupling of logic noise from the bus to the analog output, and therefore many DACs today have serial data structures. These are less vulnerable to such noise (since fewer noisy pins are involved), use fewer pins and therefore take less board space, and are frequently more convenient for use with modern microprocessors, most of which have serial data ports.

Some, but not all, of such serial DACs, have both data outputs and data inputs so that several DACs may be connected in series, with data clocked to all of them from a single serial port. This arrangement is often referred to as "daisy-chaining."

Of course, serial DACs cannot be used where high update rates are involved, since the clock rate of the serial data would be too high. Some very high-speed DACs have two parallel data ports, and use them alternately in a multiplexed fashion (sometimes this is called a "ping-pong" input) to reduce the data rate on each port as shown in Figure 8. The alternate loading (ping-pong) DAC in the diagram loads from port A and port B alternately on the rising and falling edges of the clock, which must have a mark-space ratio close to 50:50. The internal clock multiplier ensures that the DAC itself is updated with data A and data B alternately at exactly 50:50 time ratio, even if the external clock is not so precise.

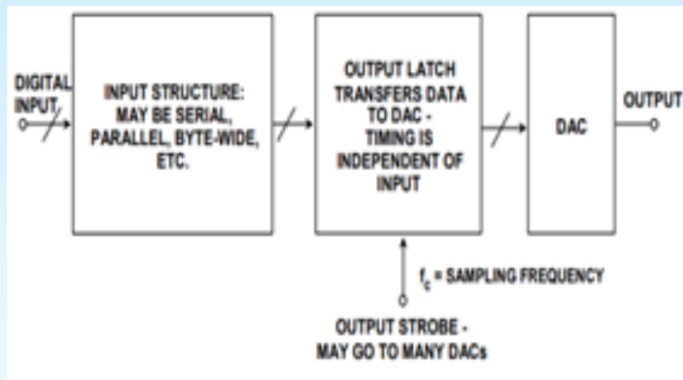


Figure 7: Double buffered DAC permits complex input structure and simultaneous update

Source:

<https://www.sciencedirect.com/topics/engineering/digital-to-analog-converter>

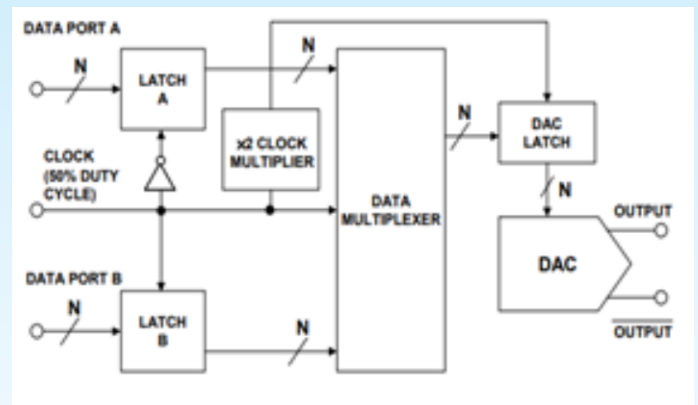


Figure 8: Alternate loading (ping-pong) high-speed DAC

Praveen Kumar
IV ECE B

Staff Achievements

- **Dr. Yasha Jyothi M Shirur** received “Senior Membership” as a recognition from Professional body IEEE Advancing Technology for Humanity in the year 2022.
- **Prof. Keerti Kulkarni** submitted her Ph.D. thesis during February 2022.
- **Prof. Padmaja Jain**, Dr. Rajini V Honnunar, Dr. Somashekar Malipatil filed a patent on “GaN/Sapphire Based Micro-Ring Resonator for Optical Delay Line” in Patent Application Publication, Patent office Journal No.05/2022 dated 04/02/2022.
- **Dr Bindu S, Dr. Jyoti R Munavalli and Mrs Keerti Kulkarni** have applied for patent for the project “A smart yoga instructor device for guiding and correcting yoga posture of a real time user.” with Patent Application Number: 202241014404 on 16-03-2022
- **Dr. Yasha Jyothi M Shirur** gave a talk on “Tips for Effective Paper Writing” in a one week Online National Level Faculty Development Programme (FDP) on Essentials for Research organized by Dr. D. Y. Patil Institute of Technology, Pimpri, Pune on 21st April 2022.
- **Prof. Lakshmi Bhaskar** filed a patent on “Shape and Configuration of Pregnancy Monitoring Apparatus” with the Patent number 358315-001 in Journal No. 16/2022 dated 22/04/2022.
- **Dr. Chaitra N, Akshatha Pramod, Deeksha R, Fauziah Batool I, and Bhoomika M U** filed a patent titled “Remote and real time monitoring system for people in need of special care” with Application No: 202241036267 on 24th June 2022.
- **Prof. Rohini T** was a guest speaker on the topic titled “Building good Habits” on 5th March 2022 and on the topic titled “Instructional design using innovative teaching methodology” on 23rd April 2022 in the webinar organized by Atal Bihari Vajpayee Trust, ABHAV Foundation.
- **Prof. Rohini T** was a guest speaker in a podcast organized by Find-aim.com about “NCC and its benefits” on 22nd May 2022. Part-I: <https://youtu.be/LqboRutYX6Y> and PART-II: <https://youtu.be/WcddEXgInys>

Staff Publications

- **Jyoti R. Munavalli**, Shyam Vasudeva Rao, Aravind Srinivasan, and G. G. van Merode published a paper titled "Dynamic Layout Design Optimization to Improve Patient Flow in Outpatient Clinics using Genetic Algorithms" in Algorithms, March 2022.
- **Dr. Bhuvana Suganthi D** published a paper titled "High Confidential Routing Algorithm for Safety Road Measures using Multi Secure Techniques" in GIS Science Journal, Volume 9, Issue 6, May 2022.
- **Lakshmi Bhaskar** presented a paper titled "Performance analysis of classic LEACH vs CC-LEACH" in the International Conference on Computer Vision and Robotics (CVR 2022) held in May 2022 BBDU Lucknow, India (Online Mode)
- **Priya R Sankpal** and **P. A. Vijaya** published a paper titled "Fusion Implementation of Security Mechanisms for Secured Transmission of Images" in 3rd International Conference for Emerging Technology (INCET) held on 27th to 29th May 2022, pp. 1-8, doi: 10.1109/INCET54531.2022.9824757.
- **Anuradha J P, Ashwini S Savanth** published a paper titled "Monitoring System for Standard Operating Procedures during COVID-19" in the International Journal of Creative Research Thoughts (IJCRT), ISSN:2320-2882, Volume.10, Issue 6, pp.f207-f211, June 2022
- **Sujaya B.L.**, and S.B. Bhanu Prashanth published a paper titled " Design and Performance analysis of Human Body Communication (HBC) Digital Transceiver for WBAN Applications on FPGA Platform" in the International Journal of Electrical and Computer Engineering (IJECE)., Vol. 12, No. 3, pp2206-2213, June 2022.
- **Priya R Sankpal** and **P. A. Vijaya** published a paper titled "Fusion Implementation of Security Mechanisms for Secured Transmission of Images" in 3rd International Conference for Emerging Technology (INCET) held on 27th to 29th May 2022, pp. 1-8, doi: 10.1109/INCET54531.2022.9824757.
- **Sujaya B.L.**, and S.B. Bhanu Prashanth published a paper titled " Design and Performance analysis of Human Body Communication (HBC) Digital Transceiver for WBAN Applications on FPGA Platform" in the International Journal of Electrical and Computer Engineering (IJECE)., Vol. 12, No. 3, pp2206-2213, June 2022.

Student Publications

- **M Bharathi, Dr. Yasha Jyothi M Shirur** presented a paper titled "FPGA Realization of High Speed Multiply and Accumulate Cores to Digital Signal Processing: Distributed Arithmetic and Offset Binary Coding" in National Conference on Recent Trends in Engineering and Technology -2021 (RTET-2021) organized by Department of Electrical and Electronics Engineering, KSRRM College of Engineering (Autonomous) on 29th Dec. 2021.
- **Meghana M, Dr. P. A. Vijaya** published a paper titled "Synthesis and timing analysis of an automatic coffee/tea vending machine" in International Journal of Creative Research Thoughts, ISSN:2320-2882, Vol. 10 May 2022.
- **M Bharathi, Dr. Yasha Jyothi M Shirur** presented a paper titled "Area Efficient Multiply and Accumulate Core Design on FPGA using Pezari's Multiplication" in National Conference on Industrial IoT and Automation (NCIITA) Organized by SRM Institute of Science and Technology during 5th-6th May 2022.
- **Chitrashree, Samanvitha, and Dr. Bhuvana Suganthi D** published a paper titled "A Survey on IoT Based Garbage Monitoring System Using Solar Panel" in Dickensian Journal, Volume 22, Issue 5, May 2022, Page No. 1674 - 1688.
- **Tejas S Koundinya, Brinda S, Nikhil S, Meenakshi Aishwarya Thelapurath, R Chinmayee and Jyoti R Munavalli** presented a paper titled "A Comparative Study of Joint and Bolt Structures with and without Edge Detection using CNN" at the 2023 International Conference for Advancement in Technology (ICONAT) Goa, India during 24th – 26th Jan 2022.



"The reason most people never reach their goals is that they don't define them, or ever seriously consider them as believable or achievable. Winners can tell you where they are going, what they plan to do along the way, and who will be sharing the adventure with them." -

- Denis Watiley

Students' Achievements

Swathi Dayananda secured VTU 1st Rank in B.E and received seven gold medals from VTU during the 21st Annual Convocation held at Belagavi on 10th March 2022 and Gowri R secured VTU 4th rank in MTech (VLSI and Embedded Systems).

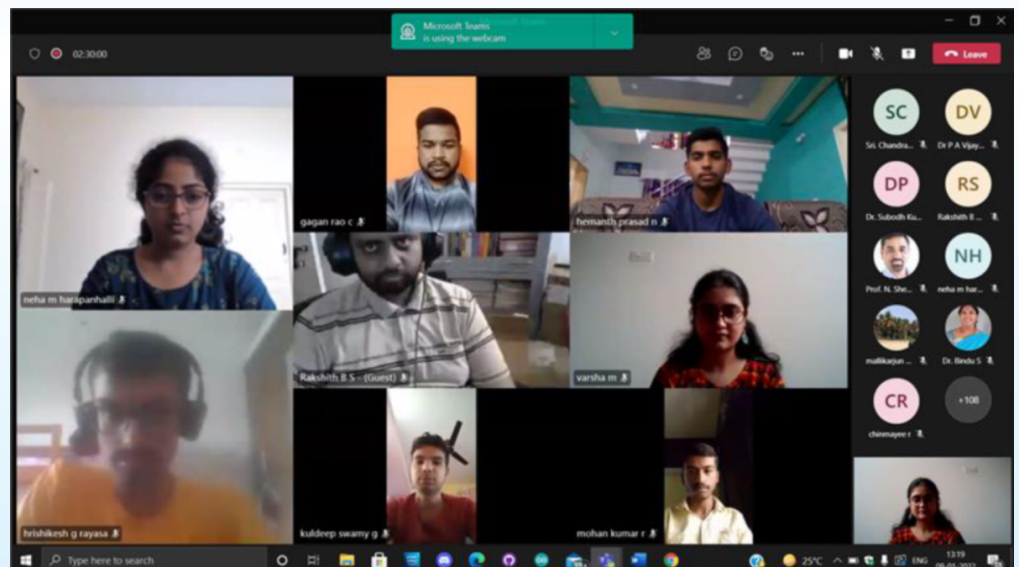


The Management of BNMIT honoured Swathi Dayananda and Gowri R with Gold Medal and Rank Certificates

Departmental Events

Institution of Engineers India Students' Chapter-ECE, BNMIT conducted a one-day workshop on “MATLAB & Simulink for Low-Cost Hardware Integration” on 8th January 2022.

On 8th January 2022, the Resource Person Mr. Rakshith B S, Senior Application Engineer for Mathworks Products at CoreEL Technologies, Bengaluru discussed on Hardware support packages that enable users to stream sensor data into MATLAB and automatically generate code to run Simulink models on real hardware like Arduino and Raspberry Pi.



Did You Know

- *On an average, people read 10% slower from a screen than from paper.*
- *The first computer mouse was made in 1964 by Doug Engelbart. It was rectangular and made from wood!*
- *Until 2010, carrier pigeons were faster than the internet.*
- *No one has received more U.S. patents than Thomas Edison – 1,093 to be exact.*
- *One-third of the world's population has never made a telephone call.*

ISTE Students Chapter – BNMIT organized a Three-days' workshop on “Design and Implementation of Humanoid Robots” from 7th to 9th April 2022.



Dr.Krishnamurthy G.N., Principal, BNMIT, Dr.P.A.Vijaya, HoD, ECE, BNMIT along with Resource persons and participants of the workshop. Resource persons Mr. V. Sudharsan, Assistant Professor, Head R&D cell, Panimalar Institute of Technology, Chennai, Tamil Nadu, and Mr. A. S. Faraz Ahmed, final year student, Department of Information Technology, Panimalar Institute of Technology, Chennai, Tamil Nadu gave a hands-on and practical demonstration on the design and implementation of Humanoid Robots.

A Five-Day Skill Development Programme on “Machine Learning with Raspberry Pi & Python” was conducted by Subhanu Technologies and Solutions Pvt Ltd., Bengaluru from 11th to 19th April 2022 for students of 5th semester ECE.



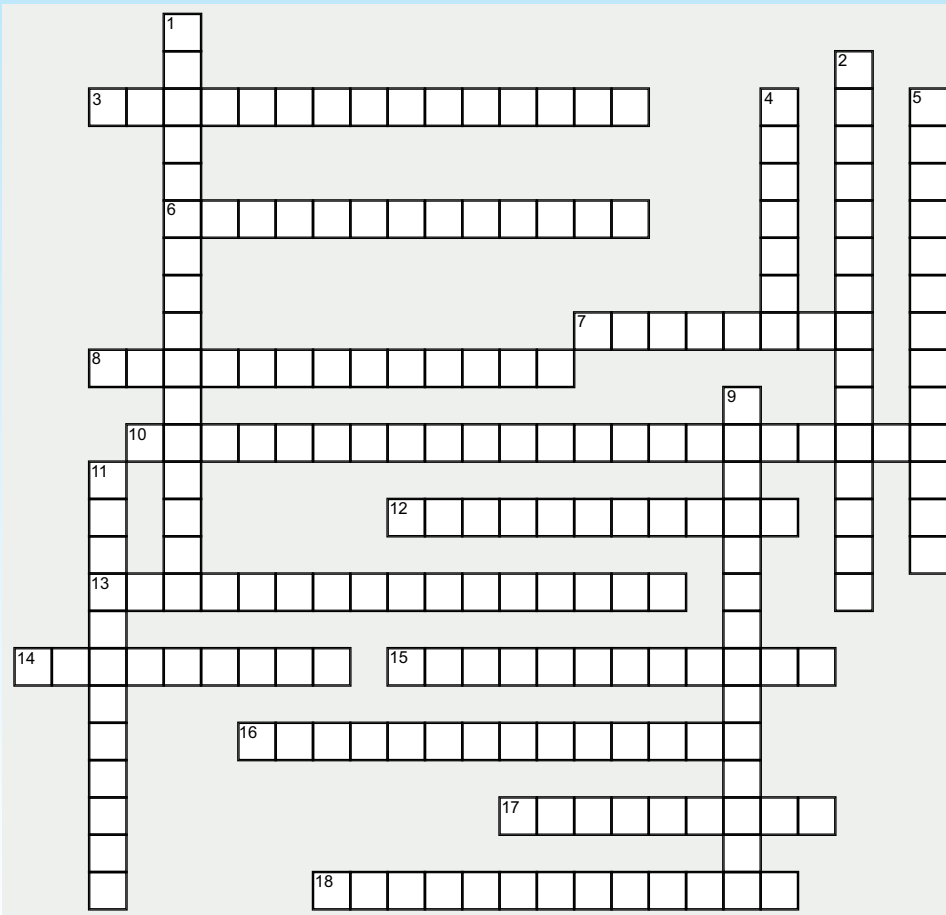
Dr.S.Y.Kulkarni, Additional Director, BNMIT, Dr.P.A.Vijaya, HoD, ECE, BNMIT along with Resource persons and participants of the workshop. Resource persons Mr. Raghu Kumar C K and Mr. Sandeep Srinivas from Subhanu Technologies and Solutions Pvt Ltd., Bengaluru introduced the students to Machine Learning, IoT, Python programming and Raspberry Pi. The SDP mainly aimed at providing students with hands on experience on applying Python Programming in Machine Learning and model IoT applications using Raspberry Pi.

ISTE Students Chapter – BNMIT organized a one-day Industrial visit to CII –EXCON, Bangalore International Exhibition Centre on 18th May 2022 for 6th semester students.



Students and Faculty Members at the CII-EXCON, International Exhibition Centre, Bengaluru. The visit is a part of educational trip under ISTE students' chapter. This visit is on the platform of AI, IoT and Automation Pavilion. Fifty students from 6th semester ECE along with two faculty members Dr. Rekha P, Associate Professor, Dept. of ECE and Mrs. Sumathi A, Associate Professor, Dept. of ECE participated in the industrial visit. The visit was guided by supervisors of CII-EXCON. Industries from national and international level exhibited their AI, IoT based products. It was a great place for Business & Networking Opportunities.

CROSSWORD



Across

- 3. This control system generates an output frequency, which can be either higher or lower than the input, based on a reference input clock [three words]
- 6. An instrument for measuring acceleration.
- 7. 1,152,921,504,606,846,976 bytes
- 8. This type of cell consists of a thin plastic film sandwiched between two metal stators
- 10. This type of system's size ranges from 20 μm to 1 mm
- 12. The ability to execute more than one program or task simultaneously.
- 13. Amount of water vapor in the atmosphere expressed as a percentage of the total amount the air can hold at the current temperature [two words]
- 14. The functional equivalent of a synapse

15 Used to measure tilt.

16 Its output voltage is greater than its input voltage [two words]

17 American engineer (1890—1954) who invented the regenerative circuit, the super-regenerative circuit, the superheterodyne receiver, and modern frequency modulation (FM) radio transmission

18 American engineer (1860–1898) who invented an induction meter to measure alternating current

Down

1 Can be produced using two sensors spaced at odd half-slot multiples around a single track [two words]

2 Because these devices have only one track per bit of resolution, they can require large diameters, which gives them a nonvolatile and unique output for each position [two words]

4 Italian physicist Alessandro Volta (1745–1827) is credited with inventing the first one of these in the 1800s

5 A piece of software, firmware, or logic circuit that takes a digital data flow as an input and provides a filtered version of this signal on its output [two words]

9 A low-to-high transition means "0" and a high-to-low transition means "1" [two words]

11 The use of very-large-scale integration (VLSI) systems containing

| | | |
|--------------------|---------------------------|---------------------|
| | 13 RELATIVE HUMIDITY | |
| | 12 CONCURRENCE | 11 NEURMORPHIC |
| 18 SHALLENBERGER | 10 MICROELECTROMECHANICAL | 9 MANCHESTER CODE |
| 17 ARMSTRONG | 8 ELECTROSTATIC | 5 DIGITAL FILTER |
| 16 BOOST CONVERTER | 7 EXIBYTE | 4 BATTERY |
| 15 INCLINOMETER | 6 ACCELEROMETER | 2 ABSOLUTE DECODER |
| 14 MEMRISTOR | 3 PHASE LOCKED LOOP | 1 QUADRATURE SIGNAL |
| ACROSS | ACROSS | DOWN |
| Answers | | |

Alumni Speaks.....



"College is not just a set of buildings made of brick and mortar; it is the people there who make it what it is". I completely agree with the above comment that one of my teachers made during my 3rd year. It is the people at BNMIT, be it the teachers, administrative staff, management, or my classmates who made my 4-year stay, a memorable one.

A well-rounded curriculum, along with proficient teachers and access to the latest technology made the academic journey of engineering fun and purposeful. Not only academic and technical events, but BNMIT has always supported me to pursue my passion for Sports. Being a national level Table Tennis player, the strong Sports department, and the support from the management for extra-curricular activities was one of my reasons to choose this college over others to pursue my BE. As the Captain of the TT team, I can vouch that the constant encouragement from the Sports staff, the accommodating and understanding nature of our teachers, and of course, the performance of my team were the key contributors to the numerous trophies that are now proudly displayed at the college.

Overall, I cherish every moment spent at BNMIT. It was here that teachers turned into mentors who inspired us to set high goals & achieve them and classmates became close lifelong friends.

Raksha Ramkumar

Year of Graduation 2019

*Pursuing MS in Electrical and Computer Engineering
Northeastern University, Boston*

Alumni Speaks.....



It is said that "Education is our passport to the future, for tomorrow belongs to the people who prepare for it today."

As I look back, here are a few fond memories of my alma mater:

At BNMIT, there is no compromise when it comes to securing a student's future, and this is evident in terms of the emphasis given to quality education. I can happily attest to the fact that I have learned the fundamentals of engineering from the best faculty, and it has been a thoroughly gratifying and rewarding journey.

I also recall the numerous instances of hands-on learning during the lab sessions during my tenure, where I was always encouraged to explore and learn more about the practical aspects of a theoretical concept. In particular, I found the Digital Electronics Lab and the Advanced Communication Lab to be most intriguing.

During the four years spent at BNMIT, my teachers have been my pillars of strength, who have always encouraged, inspired, and supported me in all my endeavors. The well-equipped facilities and resources, including labs and the library, are a great plus. Most of all, the culture that prevails at BNMIT is surely something to which I would attribute my all-around development. I shall always be grateful to my alma mater for paving the way for my bright future.

Swathi Dayanand

Year of Graduation 2021

*Associate Software Engineer
Maker Targets Team, Signal Processing and
Communications (SPC), MathWorks*

EDITORIAL TEAM

Faculty Members

Smt. Ashwini S Savanth
Asst. Professor, Dept. of ECE

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Shravya Muralidhara, IV ECE B