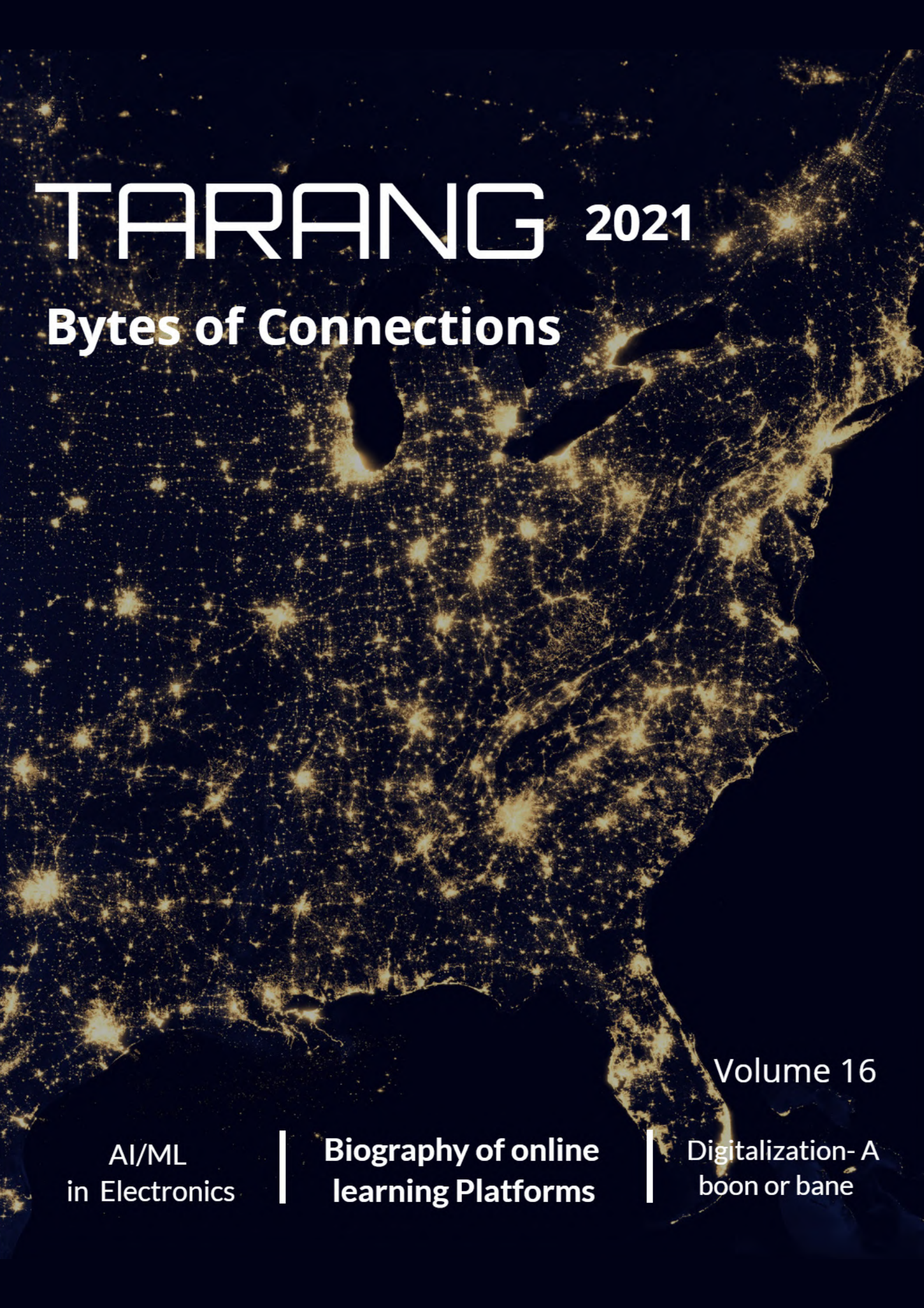


# TARANG 2021

## Bytes of Connections

Volume 16

AI/ML in Electronics

**Biography of online learning Platforms**

Digitalization- A boon or bane

# INDEX

# HoD Message

It makes me immensely proud to see yet another remarkable edition of our departmental magazine “Tarang 2021”. TARANG magazine is representative of multispectral qualities of students and teachers of the E&TC department. Despite the barriers due to the pandemic, there is no dearth of achievements and activities by our students. I congratulate the faculty members for publishing papers in reputed journals, filing patents and their participation in multiple activities.

Guest lectures and seminars were conducted by swiftly adopting online platforms. The department successfully conducted Online STTP on “Advances in Biomedical Signal Processing”. Despite such unprecedented times, all the faculty members have been quick to adapt to new methods of teaching and evaluation with equal amounts of zeal and enthusiasm to continue the learning process.

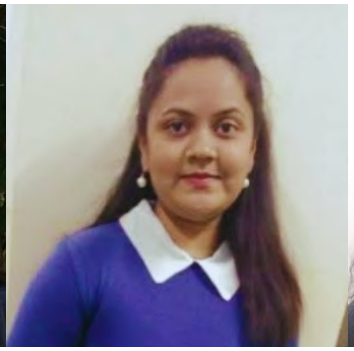
I congratulate the Editorial team for their efforts in bringing out this year’s issue centered on digitization, which is one of the most crucial aspects of how we are all coping with the new normal and pandemic. I hope the readers enjoy the articles and content of this edition.

With blessings...
Dr. Prachi Mukherji
HoD, E&TC Department.

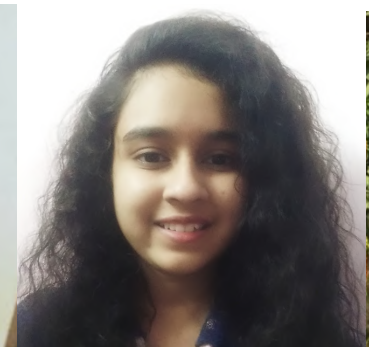
# Meet the Editorial Team!

**Dr. Seema Rajput**
Faculty Co-ordinator

**Janhavi Sathe**



**Samruddhi Raut**



**Sakshi Dighade**

**Manasi Mujumdar**

**Priyanka Balani**

**Lopa Chaudhari**

**Ananya Pendse**

# Editorial Message

After a long WFH year, we are pleased to release Tarang Vol. 16: "Bytes of Connections". As waves of the pandemic kept rolling out, electronic devices & digital communication systems built bridge after bridge between us. There were many leaps in the E&TC field, as well as in the attitude towards them. Vapid conversations about online platforms became active discourses on developing and embracing new technologies.

Tarang's 2020-21 edition, "Bytes of Connections", brings together such charged pieces about how new technologies alter parts of our world, as well as the opportunities and challenges they usher in. We sincerely hope that it proves to be insightful and sparks new ideas in the reader's mind.

Best wishes,
Editorial Team

# VIRTUAL LEARNING

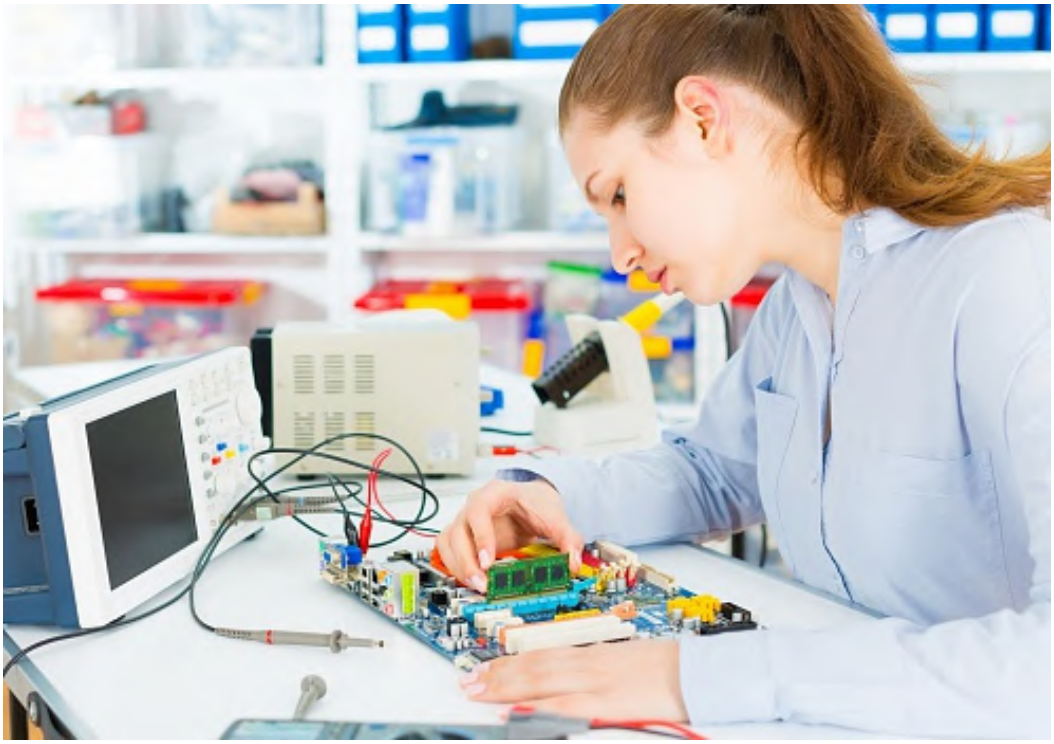
## HOW IT AFFECTED OUR NORMAL

**Shivani Khilari**

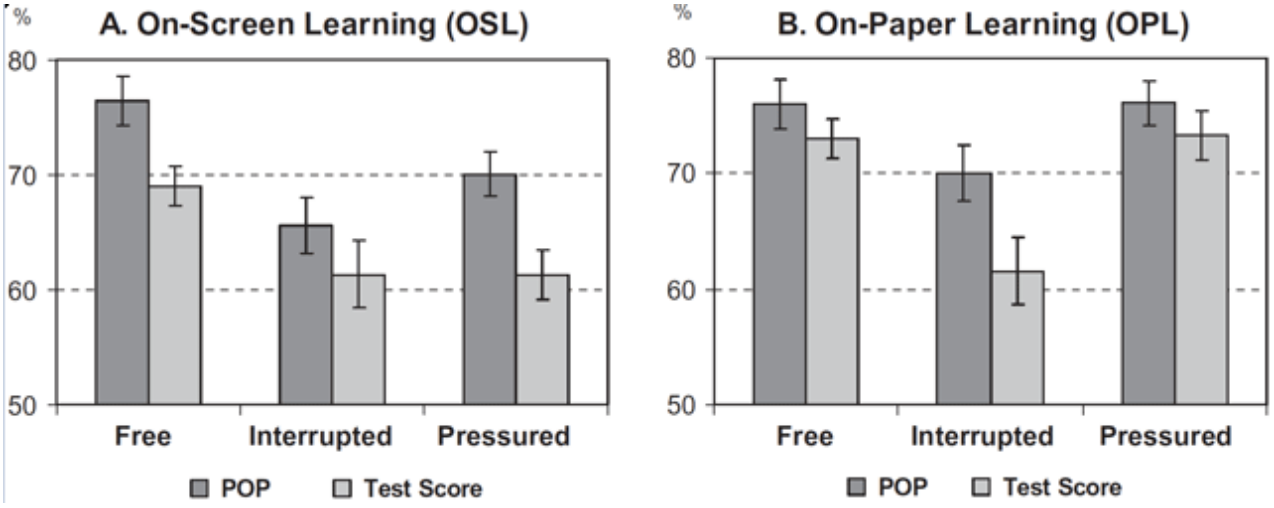
As we are facing this COVID situation we have been through drastic changes in life- from wearing masks and staying at home to social distancing. This has given a different dynamic to the normal pen and paper education. The situation has led us to virtual learning, that is, online learning. It has led to the increased adoption of virtual platforms such as Google Meet, Microsoft Teams, etc. It has made communication easy and has made it possible to continue one's education even in this critical situation. Resources are easily available in virtual format. This has also emphasized the need of digitalization and software development.

***But is this really helpful? Is virtual learning comparable to physical learning?***

In my view, NO, they are not comparable. When we learn via pen and paper, we understand it better, asking doubts and clearing the concept is easier. It gives the teachers the freedom to check whether the student is actually doing things correctly. Practicals help us understand the actual applications of a certain concept, its drawbacks, the precautions to be taken and an experience to be carried for further reference. Virtual learning disables us from practical application which is a bane as it restricts us only to learn the theoretical part of a particular concept whereas in real life what is important is practical application. When companies approach for placement they test our practical application by exams and then check about our theoretical aspects. We study sincerely for offline exams whereas virtual exams even proctored can be defeated with little tactics which keeps you undeveloped as you don't study for the exams as you used to. What we thrive for is development and understanding which helps us develop technology to our best also to get a job and be financially independent, which is very important at a certain stage of life.



Following shows a study which depicts a graphical result of online learning versus on paper learning.




Mean test scores and predictions of performance (POP) for the three time conditions for screen and paper learning. Error bars represent the standard errors of the mean. **[1]**

When we are on field visits, it helps us realize the actual application and see how people have come together to innovate the technology and acknowledge their efforts. It is also a golden chance for innovators to have a direct interaction with the people who have had their experience in the field of their career. But as we are in this pandemic we cannot have visits which is a great disadvantage.

Being on the college campus and conducting activities and sports is also an important aspect in developing one's confidence, personality and overall development. We have access to so many sources of learning, like libraries, our professors and field visits, all of which is now being restricted. Jobs have been affected during this pandemic which has increased the competition and a need to be better than your peers for a secured future.

**[1]**: Myrberg, Caroline, and Ninna Wiberg. 2015. "Screen Vs. Paper: What Is the Difference for Reading and Learning?". Insights 28 (2): 49–54. DOI: http://doi.org/10.1629/uksg.236

In this article, I have focused on the advantages of offline learning which includes experience as that is what we learn from and which forms one of the very important pillars for our future endeavors.

Practical application is nothing but how we use the knowledge we gain. And face to face interaction which is very important to live in this world as we need each other's support to tackle the world crisis together!

**Shivani Khilari**

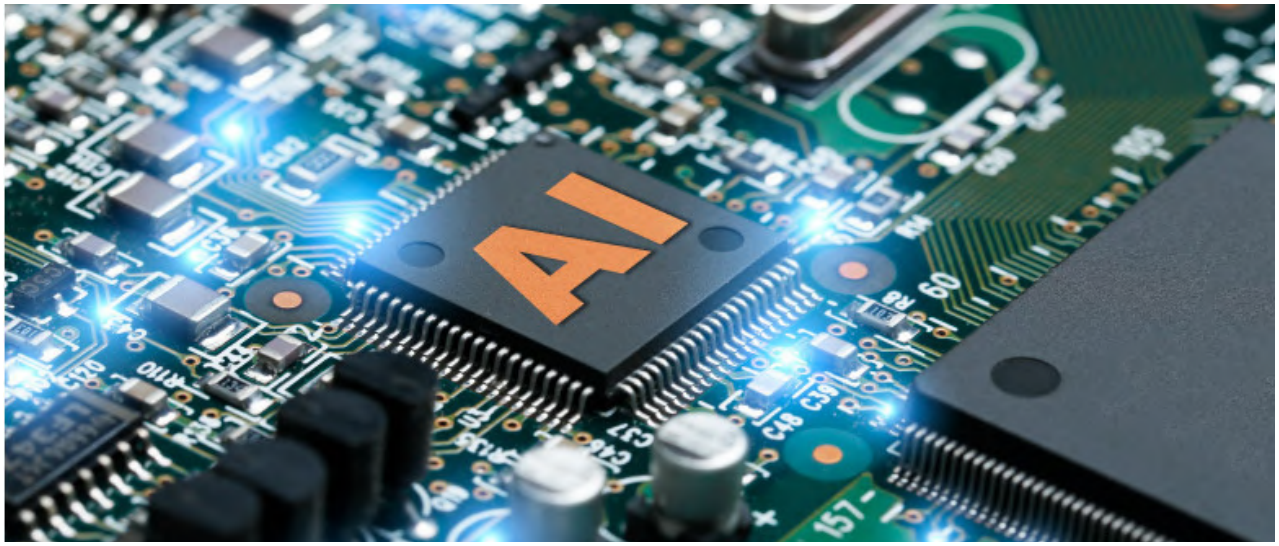
*Second Year*

# AI / ML IN TELECOMMUNICATIONS

**Simran Deore**

Artificial intelligence and Machine learning are disrupting and transforming businesses. Telecommunication industry can leverage these technologies to improve their customer experience, enable self - service, improve equipment maintenance and reduce operational costs at the same time. Telecommunication companies have traditionally battled challenges like network operation and infrastructure issues, complex nature of networking systems, improper utilization of resources, traffic congestion and delay, virtual assistance related issues and ever- increasing bandwidth requirements.

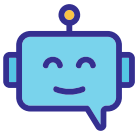
*Application of artificial intelligence for the telecom sector has helped organizations to boost growth and revenues, while also helping to improve network capabilities and enabling faster processing of large volumes of data.* Let us take a look at some integrations of AI in the Telecommunications industry!



**Chatbots for Operational Support & Automated Self-Service**

It is often seen that some telecom companies, in order to reduce user complaints, make it difficult for the user to access options for online chat, phone numbers and contact forms on website and user portals. And when the user finally connects with a person over chat or call, they often do not get the information or answers they seek.

However, with machine learning based chatbots, companies have 24/7 chatbots, helping customers quickly access the information they require with help of a ticketing system. In addition, chatbots with NLP capabilities have the ability to interpret the meaning behind the customer's words. Such chatbots can also detect from a customer's tone of voice or word choice, if the customer is frustrated or angry.



**Network automation and optimization**

AI and ML technologies can allow network operators to leverage advanced automation in network operations, which can help optimize network architecture and improve control and management.

**Predictive maintenance using AI applications**

Artificial intelligence algorithms use data-driven techniques to monitor the current condition of equipment and predict equipment failure based on the analysis of
previous patterns. This makes it possible to proactively fix issues with equipment like power lines, data center services, cell towers and also various devices that are placed in the homes of the customers.

**Security**

As electronic companies manufacture more smart and connected devices for industry, home and customer use, they need to ensure the security of these devices as well. More connected devices mean more opportunity for cyber criminals. With AI, manufacturers are adding in-built security options for these connected devices and making them more secure than ever.

There is no doubt that machine learning and artificial intelligence will make the edge more intelligent and pave the way for next-gen telecom solutions. We have machine learning capabilities across cloud, hardware, neural networks and open-source frameworks.

Our AI and ML services help telecom clients in implementing a highly- scalable, reliable and cost-efficient solution that combines AI, ML and IoT.

**Simran Prashant Deore**

*Third Year*

# APPLICATIONS OF AI/ML IN HARDWARE ELECTRONICS

**Priyanka Balani**

AI is a subfield of computer science that involves making computers and electronic-based products more intelligent by mimicking the human brain. AI is especially useful in analyzing and interpreting masses of data and deriving real useful knowledge from it. The Center for Advanced Electronics Through Machine Learning (CAEML) enables fast, accurate design and verification of microelectronic circuits and systems by creating machine-learning algorithms to derive models for electronic design automation.

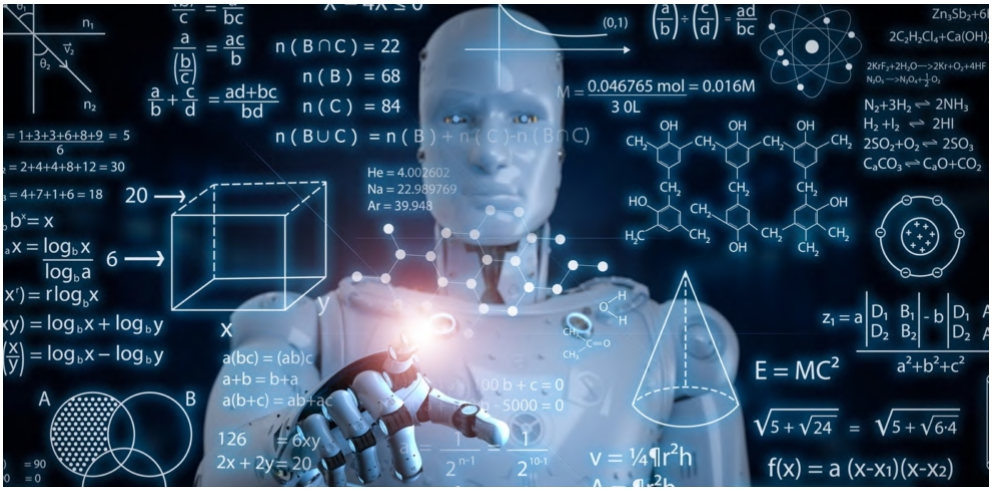

**Areas where AI/ML is proving useful for the electronics industry**

The possibilities of using AI in electronics are endless and it will be interesting to see the various areas in which companies will incorporate AI in the near future. For now, we will be discussing the three areas where it has a major impact currently:

**R&D**

Leading electronics equipment manufacturers like Samsung, Mitsubishi, and Hitachi are using AI to carry out advanced research.

These companies are making long-term investments in AI research to find commercial applications and to explore how this technology can help to improve their existing product range. The research focuses on machine vision, voice recognition, audio processing and other key areas related to AI. Through these R&D programs, organizations try to have a better understanding of the usage context, user behavior, their preference and needs.

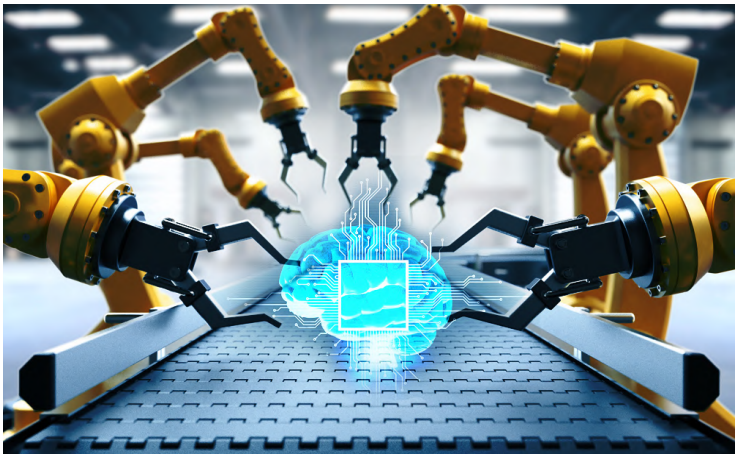



**Manufacturing**

We have already discussed above, how companies are manufacturing transformative AI-powered electronics devices that benefit other industries. However, the use of AI is not just limited to this area of manufacturing. The industry is also using AI to reshape product development cycles, improve product design processes, reduce defects and deliver products faster to the market.AI-enabled electronics manufacturing helps companies to create agile

AI-enabled electronics manufacturing helps companies to create agile workflows for the rapid development of the next line of products.

They combine and collect anonymized data from various sources like sensors attached to the products, customer usage patterns, current market scenario, audio and video files, technician comments, device manuals and more. This helps to generate key insights through which electronic companies are able to improve product quality, reduce costs and answer to market demands in a more efficient manner.



**Security**

As electronic companies manufacture more smart and connected devices for industry, home and consumer use, they need to ensure the security of these devices as well. More connected devices mean more opportunity for cybercriminals. With AI, manufacturers are adding in-built security options for these connected devices and making them more secure than ever.

**Other applications of AI/ML in electronics hardware are:**

1. Artificial Intelligence Based Dynamic Strain Measurement System on FPGA
2. Artificial Intelligence Robotically Assisted Brain Surgery
3. Artificial Intelligence Approach for Project Portfolio Management
4. Artificial Intelligence and Multi Agent Systems Project Report: Vehicle Models, Formation Keeping and Obstacle Avoidance
5. Robotics and artificial intelligence: A perspective on deliberation functions

**Priyanka Balani**

*Third Year*

# Sharada Ohatkar

## Insights and Takeaways from AI & Wireless Communication

**What was the main reason for choosing your topic of research as 'Artificial Intelligence and Wireless Communication'?**

Teaching courses in communication domain since 1997, I was eager to explore practical applicability in wireless communication domain. My topic of research "A Heuristic Approach for Interference Reduction in Channel Assignment of Cellular Radio Network". The combination of Artificial intelligence techniques with wireless communication scenario was really a cool topic in 2009.
We had 2G - 3G - 4G cellular service providers who were striving to reduce call dropping on move by reducing interference for customers satisfaction. For today's wireless mobile communication systems, efficient use of limited radio spectrum with minimum interferences is required. So, proposed to develop a heuristic approach with computational intelligence for minimizing the interference in Channel Assignment.

**How did you integrate AI an entirely software domain with a core electronics domain wireless communication?**

When we say wireless communication, its not only about hardware but today its more about software which makes hardware to work magically. With this communication amongst us is becoming more measurable, quantifiable, and engrossing us virtually with minimum interference.

Objective of my work:

1. To study channel assignment schemes in cellular network for low, medium and heavy traffic demand with interference constraint.
2. To investigate how channels need to be assigned and reused to minimize communication interferences.
3. To propose a Heuristic Method for the NP-Hard problem of channel assignment.

- Leading to Minimizing connection set-up time
- Adapting to changing load distribution
- Maximizing number of calls that can be accepted.
- To reduce the problem of call drop due to interference.

**Was there any specific domain/technique of AI such as speech understanding, natural language processing that you utilized in your research?**

My work focused on Optimizing channel assignment with a heuristic approach with computational intelligence for minimizing the interference in Channel Assignment. I worked on Genetic algorithm, Particle Swarm Optimization and Ant Colony Optimization and its effectiveness is providing Quality of Service. The work can be extended by experimenting with heuristics for overcoming todays problems in 6G!!!

**Are there any potential applications of your research?**

Yes, of course and we are potential customers of 6G, 7G!

**How important is it to do a research from a student's perspective?**

Today's generation YOU are very smart, intelligent, knowledgeable, dedicated and specially being female more focused, dedicated, sincere, hard worker and multitasker. If you try to explore your full potential no one can stop you from achieving impossible.

Research is not a project to be completed as a part of your curriculum. In the process you discover yourself, your strength, your limit, your sustainability, your patience, your success, your imagination it stretches you to a NEW YOU. (I am sure faculty will agree with me 100%). Keep observing, thinking about some problems encountered in your area of interest. Try to go for finding its solution in reputed journals, magazines, talking and listening to experts, attending workshops, visiting industries discussing with peers. Outcome of your research work will be:

1. Publications in reputed international journals and Conferences. The pleasure of writing our own work and getting it recognized by experts internationally is the achievement. I have 10 papers published on my PhD research work 2 SCI, 8 SCOPUS Index publications.
2. You can file Patent, Copyright. Can be part of research project with Faculty.
3. You are shortlisted for pursuing M.S in your dream university.
4. You take big leap in your career in short amount of time.
5. Your work will be representing quality of department, college, Maharashtra, Pune, INDIA and you Grand Ambassadors.

# Ashok Khedkar

## Insights and Takeaways from Wireless Communication

**What was your main reason for choosing your research topic on "Wireless communication"?**

Since from my graduation I was interested in Communication related subjects. After joining Cummins college of Engineering, first I got a chance to teach Microwave Engineering subject to final year E&Tc students. Then I taught other communication related subjects like Digital Communication, Antenna and Wave Propagation, Electromagnetics theory to Third Year students, Mobile Communication and Wireless Communication to Final Year and Post Graduate students. Meanwhile I completed my M. Tech in “Microwave Engineering” from College of Engineering Pune in 2008. In my M. Tech dissertation, I worked on Peak to average power ratio (PAPR) reduction techniques in Orthogonal Frequency Division Multiplexing (OFDM). As I was interested in wireless communication and I worked on OFDM technology in my M. Tech dissertation I decided to do the research in the same domain.

**What was your main domain/topic while researching under wireless communication? Could you also elaborate on the same?**

I have decided to work in the field of OFDM, as it has applications in Wireless LAN, Wireless MAN (WiMAX), Digital Audio Broadcasting (DAB), Digital Video broadcasting (DVB), LTE and LTE advanced (4G) It is also one of the proposed modulation techniques for 5G standard.

In wireless communication the performance is limited by the multipath nature of the channel (free space) which causes multipath fading. OFDM is considered as a technology which can mitigate the effect of multipath fading. In Orthogonal Frequency Division Multiplexing (OFDM), also called Digital Multicarrier Modulation (MCM) scheme, information/data is modulated by large number of orthogonal baseband subcarriers, instead of sending the data with a single carrier (SC). It is similar to sending Goods using multiple trucks instead of sending the same using single truck. If any truck meets an accident, goods carried by other trucks can be collected as compared to Single truck where all goods can be lost.

Similarly, in OFDM scheme even if some carriers are contaminated by multipath nature of the channel, other carriers can convey the information without error. Additionally, the data carried by contaminated carriers can also be recovered at the receiver by using Forward Error Correction scheme.

Though OFDM is immune to the multipath fading, there are some disadvantages, too. To decide the topic for the research in OFDM, first I had done extensive literature survey related to the main limitations of the OFDM.

I observed that PAPR and ICI are the two important limitations which can limit the performance of OFDM system. Peak to Average Power Ratio (PAPR) is caused due to the addition of large number of subcarriers and Inter Carrier Interference (ICI) can be caused due to time dispersion and frequency dispersion caused by the multipath channel.

As I worked on PAPR reduction techniques during my M. Tech dissertation, I had decided to work on ICI reduction techniques in OFDM system. I have suggested a novel negative peak augmented raised cosine pulse shape based spectral model to mitigate the ICI in OFDM system.

**Were there any difficulties you faced while doing your research?**

Yes. Obviously, I faced some difficulties during my research. In fact, difficulty faced in any research can helps you to strengthen your knowledge. During my research I have faced difficulties like time management, unable to write research papers in stipulated time etc.

**What are the potential applications of your research?**

As I mentioned earlier Inter Carrier Interference (ICI) is one of the main disadvantages of OFDM technology along with the large peak to average power ratio (PAPR). The subcarriers in OFDM are orthogonal in nature i.e interference caused by one subcarrier on rest of the subcarriers is zero. If the orthogonal nature of the subcarriers gets lost due to any reason like mismatch in oscillator frequency between the transmitter and receiver, Inter Symbol Interference (ISI) and Doppler spread (frequency dispersion due to the relative motion between Transmitter and receiver) caused by the multipath channel then the interference among the subcarriers will be increased. This interference is called as Inter Carrier Interference and it limit the performance of the OFDM system. With the help of negative peak augmented raised cosine pulse shape based spectral model I achieved the reduction in the ICI power. So, OFDM system along with the technique suggested by me to suppress the ICI can be utilized in various application like Wireless LAN, DAB, DVB, LTE networks and upcoming 5G cellular networks also.

**How significant is it to study wireless communication for an electronics and telecommunications student?**

In India approximately 450 million smart phone users are there as compared to 550 million feature phone users in 2020. Lack of internet literacy, rigidity and cost are the main reasons behind more feature phone users than the smart phone users. As per my view along with the service sector a large future scope is available for wireless industry also. We are now in the era of 5G where we are taking about the theoretical data rates of about 10 Gbps which will really make the possibility that expert surgeon siting in city hospital can do the remote robot-based surgery on a patient who got admitted in a village hospital. Also, day by day peoples are hungrier about the data than the before and we are using many wireless devices/applications in our daily life like DTH, remote control operated TV, fan, AC, Bluetooth, wireless LAN, Smart wearable devices etc. I think it is very important for Electronics and Telecommunication students to study Wireless Communication in detail. In depth study of Wireless Communication will help the students to understand modern technologies like beamforming, need of Massive MIMO, Software Defined Radio (SDR) networks, Cognitive Radio, use of Artificial Intelligence (AI) in wireless communication and all present and upcoming modern wireless networks.

# The Journey of an Unbounded University

## *Coursera*

**Sakshi Dighade**


In the fall of 2011, computer science professors at Stanford University; Andrew Ng and Daphne Koller started offering their Stanford courses online. In 2012, soon after they left Stanford, I was breathed to life.
I am Coursera, a massive open online course provider.

I work with universities and other organizations to offer online courses, certifications, and degrees in a variety of subjects. It has been an amazing journey since then.

Initially, Princeton, Stanford, the University of Michigan, and the University of Pennsylvania were the only universities to offer their content and now my offerings have expanded to even include Specializations. In 2017, I worked hard to offer master's degrees for the very first time. It puts a smile on my face as I recall it was a Masters in Innovation and Entrepreneurship (OMIE) from HEC Paris and a Masters of Accounting (MSA) from the University of Illinois. As of now, more than 150 universities offer around 4,000 courses through me and I feature over two dozen degree programs at minimal prices.


In the wake of the pandemic, many unprecedented challenges rose for universities as campuses shut down around the globe. I was all set to bridge the gap. To help universities unlock the full potential of online learning, we published "The Unbounded University: Unlocking Opportunities through Online Learning". In this report, we used my proprietary platform data to explore skill proficiency gaps between students and working professionals and even proposed a learning model. And soon, I expanded my diversity in the range of multilingual courses. Thanks to keen learners!!! I became the platform to learn from home and I made a place in their heart. I discovered the true meaning of "Home Is Where the Heart Is".

To prepare students for a competitive job market after graduation, universities are leveraging online professional certificates. I don't want to brag but I am on cloud nine today. More than half of the learners complimented me that the certificate they earned through me improved their application for a job or internship. It was a moment of pride as my Blended Learning Models proved themselves worthy.

Thanks to my buddy, LinkedIn, many universities can now access students' online certifications from industry leaders, such as Google and IBM. At times, I get disheartened when some of them rush through the courses as their sole purpose is to show off the certificate. Ah! Well, it's their loss in the journey because my secret algorithms catch when you cheat. I do maintain my code of conduct, strictly.

I am in the middle of the youthful adventure of my life. I want to expand access to world-class learning by working with global partners across 140 countries. I am working towards my goal to provide free education to tens of thousands of refugees. And with my growing network of partner organizations, I will continue to launch new programs for veterans, the formerly incarcerated, and the educationally underserved. With Coursera for Government, I am aiding governments and organizations to provide in-demand skills for the entire workforce and implement national-scale learning programs; develop locally relevant career pathways, and connect learners with regional employees. I am nurturing their hiring ecosystem by authoring content.

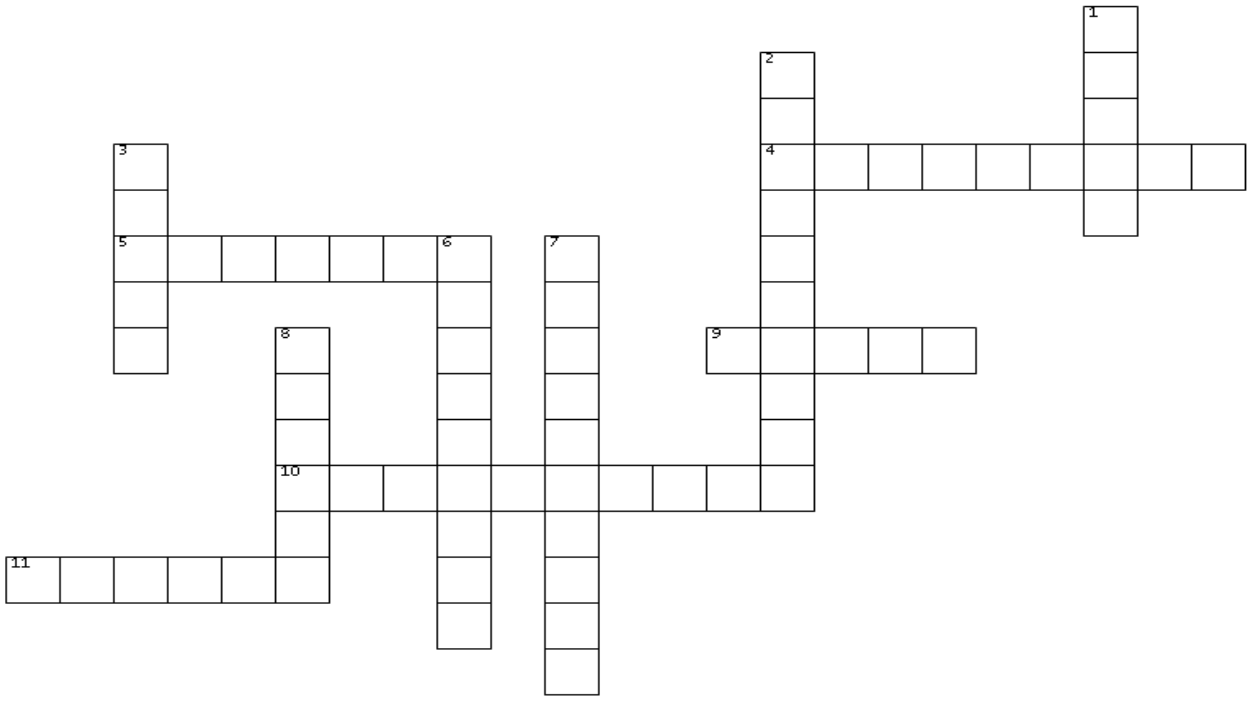
I believe that learning is the source of human progress. It has the power to transform the world. As I sign off, I don't want to get caught in the euphoria of obligation; I have a long way to impact upon growth. I hope that I have looked out for people rather than for fame.

**Sakshi Dighade**

*Third Year*

# CROSSWORD

Shivani Khilari



## ACROSS

**4.** It is a special type of the mineral magnetite and is widely used in electricity and magnetism. (hint: it is spelled and written different alphabetically) (9 letter)

**5.** It transfers energy that lasts a short period of time in clocks (7 words)

9. A device that takes a single input line and routes it to one of several digital output lines (5 letter)

**10.** What is used as inrush current limiters, temperature sensors, self-resetting overcurrent protectors, and self-regulating heating elements? (10 letter)

**11.** a device that responds to some type of the input from the environment such as heat, light, motion, temperature, pressure and moisture. (6 letter)

## DOWN

**1.** A steel lattice tower used to support an overhead power line, supplying an area with electricity also known as electric _____. (hint: it is also mentioned in harry potter) (5 letter)

**2.** An instrument designed to measure electric current, voltage, and usually resistance, typically over several ranges of value (10 letter).

**3.** A visible change in brightness of a lamp due to rapid fluctuations in the voltage of the power supply. (5 letter)

**6.** One word for charging with electricity (9 letter)

**7.** Another word for hygrostat is an electronic device analogous to a thermostat but which responds to relative humidity, not temperature. (10 letter)

**8.** A electric device that displays the rectangular formation of parallel scanning lines that guide the electron beam on a television screen or a computer monitor. (6 letter)

***ANSWERS ON PAGE 41***

# THE MATRIX

-SAMRUDDHI RAUT

“Have you ever had a dream, Neo, that you were so sure was real? What if you were unable to wake up from that dream? How would you know the difference between the dream world and the real world?” Imagine, life is nothing but a programmed simulation, an artificial world that our senses perceive to be the reality. A world that is an eternal illusion created to deceive you.

**“THE MATRIX is a fusion of some stunning visual effects, jaw-dropping action sequences and thought-provoking philosophies!”**


“The Matrix" recycles the premises of "Dark City" and "Strange Days," turns up the heat and the volume, and borrows the gravity-defying choreography of Hong Kong action movies. Directed by the Wachowski brothers in 1999, this film set a benchmark for lots of sci-fi movies. Not only were its CGI effects pioneering, it was also the first movie to introduce the concept of bullet time, a visual effect characterized by the extreme transformation of time and space.

Packed with cutting-edge visuals and stylist innovations, This movie was the defining moment for cinematic slow motion in the 21st century. The Matrix changed everything about filmmaking when it came down to visual effects. Tonnes of people walked into theatres, had their brains thrown into a knot and jaws pinned to the floor. The movie was truly a turning point for all Science Fiction films to follow. While the visuals remain stunning till date, the depth and thought around the story and execution remains one of the most amazing concepts. Occasionally a movie comes around and makes us question our own reality, The Matrix did just that.

In the end, though, The Wachowski's triumph is a much more immediate, much more visceral one. They've amalgamated comic book morality, the Hong Kong action tradition (orchestrated by guru Yuen Wo Ping), a prime chunk of Hollywood star, cyberpunk paranoia and a visual effects revolution to create a new brand of movie. This is one of those movies which gets clearer with repeated viewings and never in the first watch. It gets finer with each watch.
Just to sum it up in Morpheus's words,
"Unfortunately, nobody can be told what 'The Matrix' is. You have to see it for yourself."

**Samruddhi Raut**
*Third Year*

# KEEPING UP WITH THE NEW NORMAL

-SAMRUDDHI RAUT

What is a change? Every day of our lives, we adapt to newer things, different ideologies, and inexplicable facts. We set new precedents, and raze the old. And this metamorphosis, is only constant. As we trace the advent of change through reminisce of the past, dynamics of the present and the dreams of the future, we were just living a very normal life not having any idea about what we are going to face and BOOM! We got a major hit by a Virus “COVID-19”. Little did we know that a really small virus would affect our lives so adversely and in a way we could never have imagined.

The reality is, life is filled with uncertainty. None of us really know what the day will bring! We still get up every day and we work hard, we learn, we grow, we share, we fall, we get up, we plan, we laugh, we cry,.... And this mere uncertainty gave us the experience of Last day at college even before we graduated. None of us would ever have imagined that we shall start missing our college so much when these were the times to invent new plans to bunk the classes and that was so nostalgic at times. To think that life was normal over a month ago feels like a hoax. And gradually COVID-19 was everywhere.

It was overruling news, social media, and personal lives. Social distancing, masks and Quarantine was the new necessity, and it was difficult to get used to in the beginning.

These circumstances were not at all ideal, and given how unpredictable everything was, it sometimes made us feel uneasy not knowing what the future might look like. Over the past few months, we've experienced an unprecedented shift in our way of life due to COVID-19.

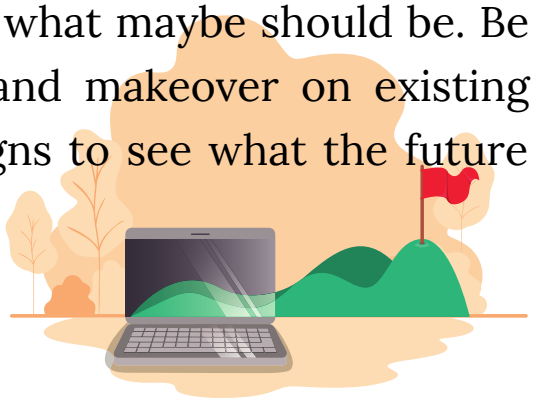
As we go through the challenges of people, technology and process. It is great to see how the communication between people continues even when it has become remote. How technology has enabled us to work remotely; and how we are evolving our processes to enable people to work seamlessly. Work hasn't stopped – releases are going on and work is 'Business as Usual'. HR was conducting sessions for wellness, activities, communicating regularly with us and keeping us connected. And as the time passed Everybody started getting used to this situation, this was the time to recognize all that you already have. This was the time to step back and look at all the things you have achieved. There was positivity, happiness and affection among people at homes and then we mentioned it as "NEW NORMAL". Adjustment is a process that looks differently for most people. This process is not liner or well-defined. Patience and flexibility are really important.

Education as we know it has changed. Schools and universities have moved online, some blending face-to-face with online lectures. Universities around the world are feeling the impact from the absence of International Students. Conferences were paused, and international collaborations and sabbaticals now look very different to previous years.

Work has also changed due to social distancing. So many of us shifted to working from home to minimise travelling on public transport and gathering in groups at the office. Zoom meetings even became our New Normal. With restrictions easing, we may cautiously rotate back into working at the office in shifts, or embrace working from home on a more regular basis. With travel restrictions in place and unlikely to lift for the foreseeable future (particularly international travel), families and loved ones are being kept apart and having to make do with online catch ups.

For as long as we have enjoyed the comfort of personal computers, humanity has been guided by a single piece of evergreen advice: Try turning it off and on again. The Covid-19 crisis, especially in its early months, effectively shut down huge sections of how our world works. From massive logistical concerns like food distribution to smaller comforts and conveniences like crowded bars and trips to the spa, some of those sectors are a long way from coming back as they were, while others are returning under new rules and regulations.

We're the generation that will herald a new era. We stand for the social, environmental, political and technological innovations that captivate the world today, which is why our opinions need enunciation on issues that need a transformation, on what could be or what maybe should be. Be it a nudge, a tweak or a whole grand makeover on existing plans, travel over these mental designs to see what the future could hold.



**CONQUERED what should be.**
**What will be,**
**We ride with the Change.**
**We win and we lose.**
**But we never Stop Living.**
**We cry in the Agony for the Feats of The Past.**
**But We never Stop changing the Future and**
**We never stop exploring the Brighter side of The Dark Web.**

The present is like clay that we have power to mould. We are in the eye of the proverbial storm that is this age we live in. Traversing over current ideas ranging over various themes, and unwrapping the present we can conquer.

-SAMRUDDHI RAUT

# Podcasts for Engineers

Lopa Chaudhari

### 1. EETimes On Air A.K.A Electronic Engineering Time On Air

The Weekly Briefing offers a thirty-minute deep-dive into the most compelling stories in electronics. Featuring subject matter experts from around the industry, Weekly Briefing lends elevated discourse to design engineers and tech industry professionals.

### 2. The Amp Hour Electronics Podcast

Listen to your hosts Dave Jones & Chris Gammell talk about electronics design and the electronics industry in general. If you have any interest in electronics at all, from hobbyist/hacker/maker to engineering professional you'll find something of interest here.

### 3. Level-up Engineering

The podcast covers the biggest challenges engineering leaders face, showing exactly how others overcame these challenges. Learn the best practices on management and leadership to understand people and organizations as much as you understand code. We interview engineering leaders and dive into the fundamentals behind hiring and retaining developers, motivating developers, scaling dev teams, mentoring developers, and much more!

### 4. Soft Skills Engineering

It takes more than great code to be a great engineer. Soft Skills Engineering is a weekly advice podcast for software developers about the non-technical stuff that goes into being a great software developer.

### 5. 99% Invisible

Design is everywhere in our lives, perhaps most importantly in the places where we've just stopped noticing. 99% Invisible is a weekly exploration of the process and power of design and architecture.

**Lopa Chaudhari**

*Third year*

# HIGHLIGHTS OF THE YEAR

Let us take a look at the activities that the students and professors of ENTC participated in, the papers that were published and all the awards received!


Display of awards and exhibits on notice board to motivate the students

# DEPARTMENT ACTIVITIES

## GUEST LECTURES

| Sr. No. | Date | Topic | Subject | Speaker | Audience | Co-ordinator |
|---|---|---|---|---|---|---|
| 1. | 29th Jun. 2020 | IoT and Enabling Technologies – An Overview | IoT | Mr. Abhijeet Deogirikar | TY and BE | Dr Anita Patil |
| 2. | 13th Oct. 2020 | Digital CMOS Design | VLSI Design | Dr. Ketan Raut | BE | Dr. Seema Rajput |
| 3. | 13th Oct. 2020 | Affiliate and linkedin Marketing | Digital Marketing | Mr Siji Varghese | TY | Prachi Waghmare |
| 4. | 29th Oct. 2020 | Network Security | Computer Network and Security | Mr. Ketan Shah | BE | Dr. Harjeet Kaur |
| 5. | 3rd - 4th Nov. 2020 | TQM, Six Sigma, CMM | Management for Engineers | Mr.Amit Dixit | BE | Dr. Prachi Mukherji, Harshala Khedlekar, Anamika Kumari |
| 6. | 30th Nov. 2020 | Television Studio | Television and Audio Engg | Mr. Sandeep Shahare | BE | Dr. Bageshree Pathak |
| 7. | 12th Dec. 2020 | Graphs and Applications | Data Structures | Mr. Sushil Kumar Bora | SY | Dr. S. A. Paranjape Prof. T. V. Pawar Prof. R. T. Suryawanshi |
| 8. | 17th Mar. 2021 | Opportunities in AI | M.Tech & PhD students | Dr. Shrirang Karandikar | M. Tech, PhD | Dr. Bageshree Pathak |
| 9. | 03th May 2021 | Object Detection using Deep Learning & Neural Networks | Digital Image Processing | Jayshree Jadhav | TY | Dr.B.V.Pathak & Sandhya Potadar |
| 10. | 23rd May 2021 | Satellite communication | Broadband Communication Systems | Ms Simran Mardhani | Final Year | Prachi waghmare |

# CONFERENCES, WORKSHOPS & SEMINARS ORGANIZED

| Sr. No. | Date | Title | Co-ordinator |
|---|---|---|---|
| 1. | 19th-20th Aug. 2020 | Audio System Processing Using Matlab | Dr. Mrudul Dixit |
| 2. | 09th Sept. 2020 | Github Workshop | Dr. Mrudul Dixit and Prof. Vanarase |
| 3. | 11th Sept. 2020 | Python Workshop | Dr. Mrudul Dixit and Prof. Vanarase |
| 4. | 12th Sept. 2020 | Online Workshop On AR/VR And AI | Dr. Mrudul Dixit |
| 5. | 15th Sept. 2020 | Data Structures and Algorithms Webinar | Dr. Mrudul Dixit and Prof. Vanarase |
| 6. | 3-5 Nov 2020, 6-7 Nov. 2020 | Online Workshop On Development Of Android Application Using Android Studio. | Dr. Mrudul Dixit |
| 7. | 7th - 12th Sept. 2020, 5th - 10th Oct 2020 & 2nd - 7th Nov 2020 | Online Sttp on Advances in Biomedical Signal Processing | Dr. Anita Patil |
| 8. | Nov. - Dec. 2020 | Online IEEE Project Mentorship Program | Dr. Mrudul Dixit |
| 9. | 17, 18 19, 25, Feb. 2021 | Online Workshop: Python Coding On Colab | Dr. Mrudul Dixit |
| 10. | 12th April. 2021 | Online Workshop On Smart Fitness Tracker Using Our Own Mobile Devices | Dr. Mrudul Dixit |
| 11. | 15th April 2021 | Webinar On Ml Using Matlab | Dr. Mrudul Dixit |
| 12. | 19th April 2021 | Problem Solving Approach For Coding | Dr. Mrudul Dixit |
| 13. | 28th April 2021 | Space Exploration Through AR/VR | Dr. Mrudul Dixit |

# STUDENT ACHIEVEMENTS

## PLACEMENTS 2020-21

| Sr. No. | Company | No. of students placed |
|---|---|---|
| 1. | Walmart Labs | 1 |
| 2. | SAP | 1 |
| 3. | Deutsche Bank | 3 |
| 4. | WDC | 1 |
| 5. | Xilinx | 2 |
| 6. | Micron | 4 |
| 7. | Citi | 11 |
| 8. | BNY Mellon | 1 |
| 9. | Oracle | 7 |
| 10. | Mastercard | 2 |
| 11. | Siemens PLM | 2 |
| 12. | RBL Bank | 1 |
| 13. | ZS Associates | 2 |
| 14. | Schlumberger | 1 |
| 15. | athenahealth | 1 |
| 16. | PWC | 5 |
| 17. | Dell | 1 |
| 18. | Addverb | 1 |
| 19. | Fractal Analysis | 1 |
| 20. | Condé Nast | 1 |

| | | |
|---|---|---|
| 21. | SE2 | 1 |
| 22. | Schneider Electric | 1 |
| 23. | Alstom | 1 |
| 24. | Eaton | 2 |
| 25. | Smiths | 1 |
| 26. | Standard Chartered | 3 |
| 27. | Rockwell Automation | 2 |
| 28. | Amdocs | 7 |
| 29. | Varroc | 2 |
| 30. | Siemens Technology | 1 |
| 31. | Accenture | 14 |
| 32. | Brillio | 5 |
| 33. | TE Connectivity | 2 |
| 34. | Amazon | 1 |
| 35. | Vodafone | 2 |
| 36. | Altimetrik | 2 |
| 37. | TCS | 5 |
| 38. | Cognizant | 2 |
| 39. | Capgemini | 10 |
| 40. | DXC | 16 |
| 41. | Yotta | 1 |

# ROBOCON

| Sr. No. | Name of the Student from | Name of the event in which participated | Month & year | Within state/ National level/ International level | Organizing Institute |
|---|---|---|---|---|---|
| 1. | Snehal Sanjay Gadre | DD ROBOCON 2020 | 27 Oct. 2020 | National 17th rank all over India | IIT, Delhi |
| 2. | Madhuvanti Oka | DD ROBOCON 2020 | 27 Oct. 2020 | National 20th rank all over India | IIT, Delhi |
| 3. | Aditi Tarate | DD ROBOCON 2020 | 27 Oct. 2020 | National 20th rank all over India | IIT, Delhi |
| 4. | Kajol Malgave | DD ROBOCON 2020 | 27 Oct. 2020 | National 20th rank all over India | IIT, Delhi |
| 5. | Pranali Sontakke | DD ROBOCON 2020 | 27 Oct. 2020 | National 20th rank all over India | IIT, Delhi |
| 6. | Vaishnavi Patil | DD ROBOCON 2020 | 27 Oct. 2020 | National 20th rank all over India | IIT, Delhi |

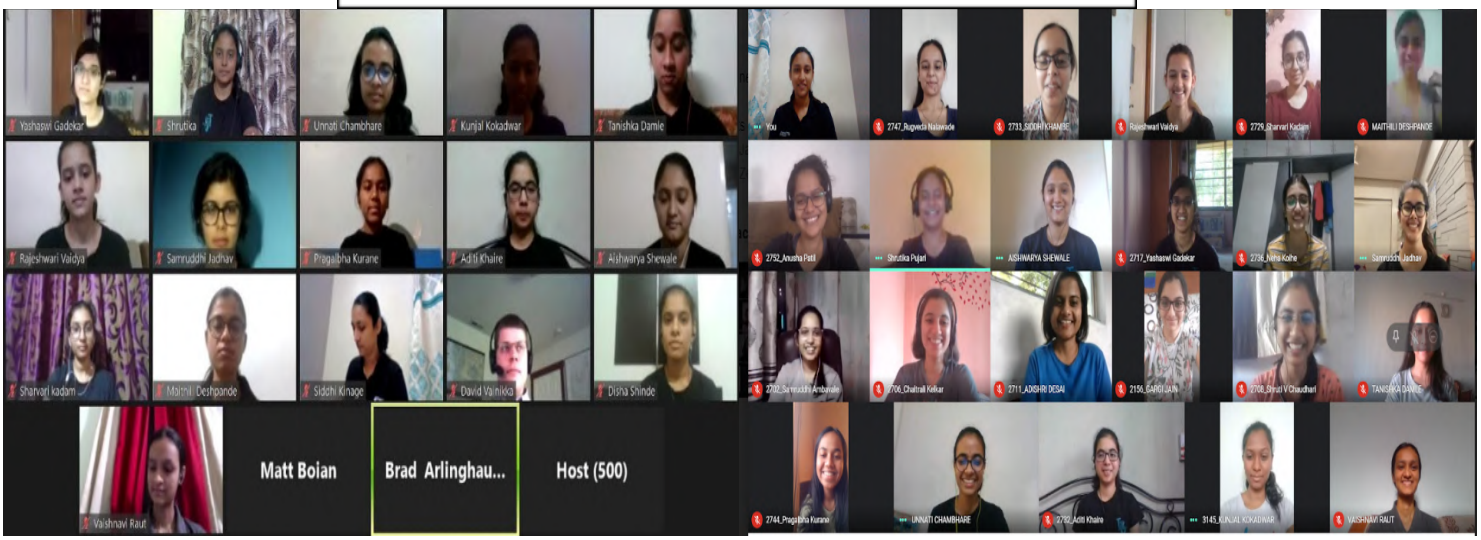

# BAJA

Students of the program (as a team member) have been participating in National level BAJA competition since 2012-13 organized by SAE INDIA which is held at Pritampur, Indore, Madhya Pradesh.

- **In the year 2020-21**:-
  Team BAJA 2021 received' Engineering Design Award' (All India Rank 2nd ). Two students of the program Ms. Gargi Jain and Ms. Kunjal Kokadwar were part of this team. The major achievements of the team are:-
  <u>All India Ranks</u>-
  • Overall rank - 13th
  • Overall static rank - 4th
  • Overall dynamic rank - 34th
  <u>Static events</u>-
  • Cost - 6th
  • Manufacturing - 5th
  • Design - 2nd
  <u>Dynamic events</u>-
  • Acceleration - 9th
  • Brakes - 10th

- **In the year 2019-20**:-
  Team won National Rank, AIR 32nd at Indore during Jan 2019 and International Rank 22nd at USA, Tennessee in April 2019. One of the students of E&TC Dept., Ms. Chanchal Choudhary was a team member.

International Event Presentation Photos of Team BAJA 2020-21



## PAPER PRESENTATIONS

In the year 2020-21, 2 students, in 2019-20 total 9 students and in 2018-19 total 21 students of the program presented papers at various international level journals and conferences. Details of participation are as:-

| Sr. No. | Name of the Student | Title of the Paper | Month & year | Within state/ National level/ International level Publication or Journal or Event | Organising Institute |
|---|---|---|---|---|---|
| 1. | Rajrajeshwari Kulkarni | Spatial modulation for future wireless network | January 2021 | International | Volume 8, Issue 1 IJRAR |
| 2. | Aishwarya Kale | Spatial modulation for future wireless network | January 2021 | International | Volume 8, Issue 1 IJRAR |

## PROJECT COMPETITION

In the year 2020-21, **3** students won at international level, whereas in 2019-20, 1 student won at state level and in 2018-19 total 15 students participated in various competitions at within state level out of which 7 students were winners of different competitions.

| Sr. No. | Name of the Student | Name of the event in which participated | Month & year | Within state/ National level/ International level | Organising Institute |
|---|---|---|---|---|---|
| 1. | Sanchi Wakde | Elected for Semi Finals in 'Ericsson Innovation Awards 2020', also awarded with '1000 Euros' | 2020 | International | Ericsson |
| 2. | Gunjan Mohod | | | | |
| 3. | Somya Gupta | | | | |


Ericsson Award Certificate: - Soumya Gupta (TY BTech)


Paper Presentation at SAC/ISRO, Ahmedabad


Welcome to the Snap AR Creator Residency Program! Inbox

Shavonne Hart 5 Sep 2020
to me

Hi Chanchal,

Congratulations—your proposal has been accepted for a Snap AR residency grant!

Your project has been approved for an award in the amount of **$5,000USD**, to be paid after successful completion of the program.

**The AR Creator Residency Program will begin with a kick-off meeting on Monday, September 14 at 9:00am PT.**

During this session, you'll hear from the Snap team, learn about what to expect throughout the program, and meet your fellow residents! We'd also love for you to introduce yourself to the group and provide a brief (two minute) overview of your project.

Ms. Chanchal Choudhary received a grant of 5000 USD for a gaming lens at Snap AR Gaming Residency.

# FACULTY ACHIEVEMENTS

## PATENTS

| Sr. No. | Title | Faculty | Publication Date | Country |
|---|---|---|---|---|
| 1. | Smart Pressure Cooker With Whistle Counter | Dr. Ashwini Deshpande | 24/08/2020 | India |

## AWARDS AND ACHIEVEMENTS

| Sr. No. | Faculty | Award Details |
|---|---|---|
| 1. | Dr. Prachi Mukherji | "**International Academic Leader Award 2020-21**", Instituted by the International Institute of organized Research (I2OR) |
| 2. | Dr. Sharada Ohatkar | **Letter of Appreciation**, Swayam NPTEL Local Chapter CUMMINS COLLEGE OF ENGINEERING FOR WOMEN, as a Single Point of Contact (SPOC) during the Jan-Apr 2020 semester. |
| | | "**The Best Women Award for Innovative Technology in Teaching**" awarded by Genesin of Educational Impressions, Roorkee |
| 3. | Dr. Ashwini Deshpande | "**Outstanding Women Award for Research Project of the Year**" awarded by Genesin of Educational Impressions, Roorkee |
| 4. | Dr. Mrudul Dixit | "Road accident analysis using Random Forest Algorithm" **Best Paper Presentation** in the 4th International Conference (Online) on Recent Trends in Communication & Electronics (ICCE-2020) approved by CRC Press (Taylor & Francis Group) & Sponsored by Govt. of India, AICTE New Delhi organized by Department of Electronics & Communication Engineering, KIET Group of Institutions, Delhi-NCR, Meerut Road (NH-58), Ghaziabad. |

# PAPERS PUBLISHED

| Sr. No. | Faculty | Paper Title | Journal/Conference |
|---|---|---|---|
| 1. | Dr. Prachi Mukherji | Design of Microstrip Patch Antenna using Defected Ground Structure for WiMAX Application | International Journal of Advanced Science and Technology |
| | | Temporal Feature Extraction for Improving Myoelectric based Recognition of Prosthetic Hand | 2020 International Conference on Wireless Communications Signal Processing and Networking (WiSPNET) |
| | | Bio-inspired Hybrid Algorithm to Optimize Pilot Tone Positions in Polar-code based OFDM-IDMA System | International Journal of Communication Systems |
| 2. | Dr. Sharada Ohatkar | Spatial Modulation for Future Wireless Network | International Journal of Research and Analytical Reviews (IJRAR) |
| 3. | Dr. S. S. Musale, Dr. A. S. Khade, R T Suryawanshi | A DTMOS-based power efficient recycling folded cascode operational transconductance amplifier | Analog Integrated Circuits and Signal Processing |
| 4. | Dr. Ashwini Deshpande | Comparative Analysis of Least Squares method and Extended Kalman filter for Position Estimation in GPS Receiver | International Conference on Signal and Data Processing ICSDP-2019, MITAOE, Alandi, Pune |
| | | A Smart Early Warning System for Disease Outbreak with a Case Study of COVID-19 in India | IEEE Pune Section International Conference (PuneCon), 2020 |
| 5. | Dr. Anita Patil | Heart-Rate Variability Estimation Using Photoplethysmography Signal | International Journal of Advanced Research in Science, Communication & Technology (IJARSCT) |
| 6. | Dr. Megha Borse | Detection based on multi band EEG Transmission network instability, mature & smart sleep apnea | International Journal of Advanced science & Technology |
| 7. | Dr. B.V. Pathak | Comprehensive Study of Software Testing Techniques and Strategies: A Review | International Journal of Engineering Research & Technology (IJERT) Vol. 9 Issue 08, August-2020 http://www.ijert.org |
| | | Stress Detection From Speech Signal Using MFCC, SVM And Machine Learning Techniques | International Journal of Latest Trends in Engineering and Technology |
| | | Comparison between CNN and RNN techniques for Stress Detection using Speech | 8th International Conference on Innovations in Computer Science & Engineering (ICICSE-2020 – Virtual Conference) |

| | | | |
|---|---|---|---|
| | | Comparison between LSTM and RNN Algorithm for Speech to SpeechTranslator" | 3rd International Conference on Communication, Circuits, and Systems (iC3S 2020),Kalinga Institute of Industrial Technology (KIIT), Bhubaneswar, India. |
| 8. | Dr. Mrudul Dixit | Road accident analysis using Random forest algorithm | 4th International Conference on Recent Trends in Communication & Electronics (ICCE-20) |
| | | Crime detection, Analysis and Prediction | IETE National Paper Presentation, INPP 2020 bu IETE Pune Centre and Department of Electronics and Telecommunication, Dr. D. Y. Patil Institute of Technology, (DIT,Pimpri) |
| 9. | Mr. Mahesh Pote | Design of Microstrip Patch Antenna using Defected Ground Structure for WiMAX Application | International Journal of Advanced Science and Technology |
| 10. | Manasi Pathade, Dr. Madhuri Khambete | Supervised method for congestion detection at entry and exit corridors of public places | International Journal of Image and Graphics |
| 11. | Vidya Sisale | Human detection and rescue system by ROBOT | International Engineering research journal |
| 12. | S.S.Vanarase | Acoustic Release using Fusible Link | International Journal of Scientific & Engineering Research |
| 13. | Rupali Pawar | LSB and RLE based approach for increasing payload and security of stego images | International Conference on Advances in Artificial Intelligence and Data Engineering Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 1133) |
| 14. | Mrs. R.R. Borhade | Modified Atom Search Optimization-based Deep Recurrent Neural Network for epileptic seizure prediction using electroencephalogram signals | Biocybernetics and Biomedical Engineering |

## CROSSWORD ANSWERS:

ACROSS:

4. Loadstone 5. Impulse 9. Demux 10. Thermistor 11. Sensor

DOWN:

1. Pylon 2. Multimeter 3. Flick 6. Electrify 7. Humidistat 8. Raster

# RESEARCH PROJECTS & CONSULTANCY

## RESEARCH

| Sr. No. | Faculty | Funding Agency | Title | Duration | Funding |
|---|---|---|---|---|---|
| 1. | Dr. Ashwini Deshpande | ISRO-UoP Joint Research Programme | Development of Image Quality Improvement Algorithms for Satellite imagery-Radiometric data | 2 Years (2018-2020) | Rs. 870000/- |
| 2. | Dr. Anita Patil | AICTE | Online STTP on Advances in Biomedical Signal Processing | One-week program conducted thrice (Sept., Oct., Nov.) | Rs. 4,13,333/- |

## CONSULTANCY

| Sr. No. | Faculty | Industry | Title | Duration | Amount Sanctioned |
|---|---|---|---|---|---|
| 1. | Dr. Seema Rajput & Dr. Anita Jain | AP Energy Solutions, Pune | Multi Crop Thresher Machine | 2 Years (2019-21) | Design & Development Cost |
| 2. | Dr. Ashwini Deshpande & Prof. Tejashree Pawar | Microembedded Technologies, Pune | MicroDSP6748 Development Board Applications | 1 Year | Development Cost |
| 3. | Dr. B. V. Pathak | CPR, Pune | Detection of stress from speech for police | 1 year | NA |
| 4. | Dr. Megha Borse | CPR, Pune | "Smart Stick for Police to monitor Health Parameters" | 1 year | NA |
| 5. | Dr. Shubhangi R.Chaudhary | CPR, Pune | "Smart Stick for Police to monitor Health Parameters" | 1 year | NA |

# RESOURCE PERSON

| Sr. No. | Faculty | Title/Topic |
|---|---|---|
| 1. | Dr. Prachi Mukherji | Question paper setting for Analog Communication at GIET University, Odisha |
| | | Evaluator for National Toycathon organised by AICTE |
| | | Resource Person at FDP on "A case study on EMG signal classification" at RSCOE,Pune |
| | | Reviewer and Inaugural Session Invitation for WIECON-ECE 2020 Conference by WIECON IEEE in Bhubaneswar |
| | | CDC Committee Member at VIIT,Pune |
| | | Prepared question bank for the subjects Analog Communications & Digital Communications for AICTE |
| | | Judge at National Student Research Convention: "Anveshan 2020" by RGVP (MP), Bhopal |
| | | Subject Expert for PhD oral exam on "Detection & classification of Liver Cancer using Hierarchical feature fusion mechanism" at Vel Tech,Chennai |
| | | Pre-synopsis evaluator for PhD thesis at RSCOE, Pune |
| | | PhD Progress Seminar as expert at COEP, Pune |
| | | Subject Expert for PhD-Progress Monitoring Committee at AISSMS-IOIT, Pune |
| | | Reviewer for SADHANA Journal (Online) |
| | | Reviewer for JESTEC Journal (Online) |
| | | Reviewer Int. Conference WIECON-ECE 2020 (Online) |
| 2. | Dr. Sharada Ohatkar | BOS member for M.Tech Aviation at Department of Technology, Pune SPPU |
| | | Reviewer for International Conference on Communication, Information and Computing Technology (ICCICT-2021), Mumbai (Online) |
| | | Paper setter for G.H. Raisoni College of Engg. & Management, Wagholi, Pune (Autonomous College) for ESE SUMMER 2021 |
| 3. | Dr. Seema Rajput | Reviewer for 2020 IEEE 5th International Conference on Computing, Communication and Automation (ICCCA) (Online) |
| | | Resource Person at FDP on "Smart Technology Pillars of 5G & Beyond" at SITS Narhe |
| | | External Examiner for Applied Electronics at Vishwakarma Institute of Technology, Pune-37 |

| | | |
|---|---|---|
| 4. | Dr. Ashwini Deshpande | BOS Member (Board of Studies meeting) at SES COE Kopargaon |
| | | Resource Person at AICTE funded STTP on<br>Digital Skill Development for Professionals<br>Tools for Digital Content Development<br>at JSPM's BSIOTR, Wagholi, Pune |
| | | Reviewer for Elsevier Journals (Online ) |
| | | Resource Person at AICTE STTP<br>AICTE- ISTE Sponsored REFRESHER PROGRAMME ON<br>INNOVATIVE TEACHING LEARNING PRACTICES & RESEARCH<br>at Karmaveer Bhaurao Patil College of Engineering Satara |
| 5. | Dr. Anita Patil | External Auditor for Academic Audit<br>at MMCOE, Pune on 30th Dec 2020 |
| | | Reviewer for conference papers<br>at VISHWACON 2020 the 3rd International Online Conference<br>on "Recent Trends in Engineering and Technology",<br>in Online Conference organized by VIIT, Pune |
| 6. | Dr. Megha Borse | Lecture Conduction for<br>Post Graduate Diploma in Electric Mobility (PGDEM) 2020-21<br>on the topic of<br>Fundamentals of Automotive Electrical & Electronic Systems<br>(for Mechanical group) at SPPU, COEP & CCOEW, Pune |
| | | Question Paper Setting & Assessment<br>for Fundamentals of Automotive Electrical & Electronic Systems<br>(for Mechanical group) SPPU, COEP & CCOEW, Pune |
| 7. | Dr. Bageshree Pathak | Conduction of guest lecture for IEEE students<br>on “Image Processing and Statistical Parameters” (Online) |
| 8. | Dr. Mrudul Dixit | IEEE Student Branch Student Mentorship Program<br>for AI/ML Projects (Online) |
| | | Oral Exams for Computer Networks at COEP, Pune |
| | | BoS Member of E&TC Dept of Integrated B. Tech Programme<br>at MIT-WPU School of Polytechnic and Skill Development,<br>School of Polytechnic, Pune |
| 9. | Dr. Harjeet Kaur | Paper setter for topic ME CN WBT University Level, Pune |
| | | External Examiner for Masters Exam, ME CN ICEM, Pune |
| | | Paper setter for ME CN BWT 2017 pattern at SPPU |
| | | Reviewer for Elsevier Journals |
| | | Reviewer for ICCICT-2021 (Online) |
| | | Paper Setter for BWT ME CN |