

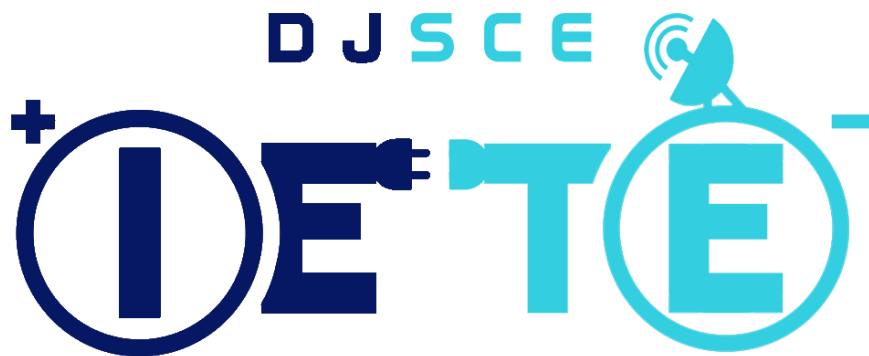


Shri Vile Parle Kelavani Mandal's

DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING

(Autonomous College Affiliated to the University of Mumbai)

NAAC Accredited with "A" Grade (CGPA : 3.18)



IETE-SF ANNUAL REPORT 2021-22



ANNUAL REPORT 2021-22

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DJ STRIKE

Response: 150+ Students

Dates: 9th August to 14th of May 2022

Conducted by: IETE-SFs committee in association with the faculty of DJSCE's EXTC Department

ABOUT STRIKE

IETE-SF's DJ Strike aims at bridging the gap between knowledge and application. The sole annual project-based competition of DJSCE; DJ Strike attracts a large enthusiastic crowd from across the college. Realising how imperative application-based learning is, a plethora of students across all disciplines come forth every year to take part in the competition.

The review process is carried out in four steps. Initially, students were required to form a group and unanimously select a particular topic for the project. After zeroing on the topic, a design report was submitted in the first review, which not only included the technical aspects but also provided an overview of the cost-effectiveness and the impact the project carries on society.

The next step was the second review wherein the group showed 20 per cent progress of their project. This progress report is a representation of the basic structure of their chosen topic. The members were screened whereupon reviewers assessed them on the basis of concept clarity, efforts and research. During this process, the faculty constantly guided and motivated students to improve their projects by sharing their wisdom with the teams.

Next in line was the third strike review, where the team demonstrated about 80 per cent of their project.

The final project submission included the exhibition of the entire project with eminent personnel coming from outside of the college to grade the project based on presentation, working, impact and other factors. Winning projects then went on to win coveted cash prizes with all qualifying papers being published in the DJ Strike Magazine 2022.



DJ STRIKE REVIEWS

Date of 1st Review: 20th to 25th September 2022

Date of 2nd Review: 20th to 24th December 2022

Date of 3rd Review: 14th to 20th March 2022

Date of 4th Review: 25th to 30th April 2022

Participants: 150+ Participants

Objectives of the activity:

- To fulfil the agenda of DJ Strike 2020 - Project to Product
- To bridge the gap between knowledge and application and Explore the integration of various concepts into one project.
- Both online and offline modes of the review were conducted to track the progress of DJ Strike participants
- To give the participants advice and direction to work in and to rectify any mistakes made in the physical interpretation of the project, ensuring cost-effectiveness and impact of the project

DJ Strike, a project-based competition organised by IETE-SF, was initiated by Dr. Amit A. Deshmukh, Head of Department, for the academic year 2019-20 with the motto: 'Project to Product'. The main objective of DJ Strike is to provide an opportunity to the students to develop and apply technical skills through project building. Thus, making the competition a great medium to encourage students to create projects worthy of becoming full-fledged final products.

The first review for DJ Strike 2021-22 occurred during the third week of September 2021. Herein students got to interact with their faculty guide, a professor that is assigned to each team for the purpose of providing efficient guidance. Herein, the teams were required to present their initial documentation to their reviewer. This documentation contained an abstract explaining the project's application and a block diagram outlining the components being utilised, along with the expected budget and plan of action that the group planned on following for the timely completion of their project.

The board of reviewers included Dr Amit A. Deshmukh, EXTC Head of Department, Dr Anuja Odhekar, IETE-SF Branch Counsellor, along with Strike Coordinators Prof. Yukti Bandi and Prof. Ameya Kadam. Dr V. Venkatramanan, Prof. S.B. Deshmukh, Dr Poonam Kadam, Prof. Rahul Taware, Dr Sunil Karamchandani, Prof. Ranjushree Pal, Prof. Aarti G. Ambekar, Prof. Shivani B., Prof. Tushar Sawant, Prof. Archana Chaudhary, Prof. Revathi AS, Prof. T.D Biradar, Prof. Mrunalini Ingle, Prof. Venkata APC, Prof. Vishakha V. Kelkar also assisted in conducting the DJ Strike 2021-22 reviews.



For the first review, teams were assessed on the objective and expected outcome of their project, social impact, innovativeness, and motivation. Along with this the contents of their documentation were also comprehensively evaluated by our reviewers by assessing the literature survey and overall presentation of the project team. Emphasis was given upon the real-world application of the project by our eminent reviewers, who guided the teams towards making their project, even more, cost-effective and efficient in various parameters. The score given to each team by the reviewer was recorded and will be added to the final score of the project.

Consequently, the second review of the year, SE students were added to the pre-existing TE student groups according to their area of interest in implementation. Once the process of group formation was complete, the second review took place during the third week of December 2021. Herein, the teams were assessed on their literature survey, project progress and implementation along with the key factor of team management and teamwork being added to the criteria set. For this review, students were able to utilise IETE-SF's component bank as well, showing 20% progress in their project.

Teams worked rigorously on the inputs provided during the first review and second review, and thus we arrived at the third review on the second week of March. With just one month left from the project competition coming to a close, the teams were asked to show 70-100% of their completed projects along with the technical paper set to be published in DJ Strike magazine in the specified format.

Finally, during the fourth review, that took place just one week before the final project competition during the last week of April, teams showcased their completed projects and technical papers to their project mentors and reviewers. The reviewers then gave valuable feedback to the teams.



DJ STRIKE PROJECT EXHIBITION

Initially about 60 groups were formed and then after rigorous review, evaluation, and gradation, 38 papers were shortlisted for the competition based on the review marks and timely submission of the technical paper for DJ Strike magazine. On the day, the Strike event commenced with a roaring success with six to seven teams being allotted to each one of the six EXTC department's labs in DJSCE. Our respected judges, Dishant Shah, a managing partner at Neo Thermal with extensive practical electronics and software experience along with Vedant Awasthi, the founding member of DJS Arya and founder of AICAN Automate LLP began judging each group one by one.

The judges made sure to evaluate the teams on their ability to become a product, presentation, implementation and innovation. Both the judges encourage teams towards thinking about taking their projects on a larger scale and turning the project into an industry level product, offering software and tools for the same. After a smooth demonstration of all the projects, the judges deliberated over the winning teams, and finally came on the following teams as the projects they found the most promising.

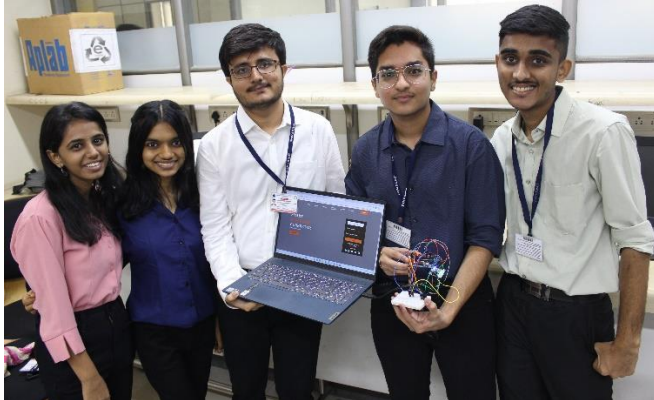
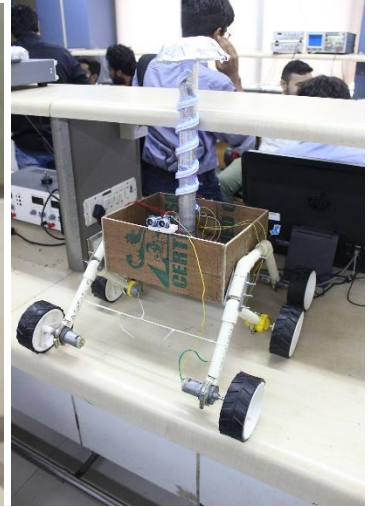
Position	Paper Name	Members	Faculty Mentor
1	IoT based Autonomous Vehicle with Lane Detection, Traffic Signal Detection Using OpenCV Python	Harshal Vaidya	Prof Aarti Ambekar
		Sohail Shaikh	
		Sanika Kanawade	
		Vrisha Shah	
		Adit Vakil	
2	Audio Source Separation as applied to Vocals-Accompaniment Separation	Vanshaj Agrawal	Dr. Sunil Karamchandani
		Soham Sawant	
		Sharath Pai	
		Arsh Nirmal	
3	Smart Drive	Darshan Mehta	Prof. Yukti Bandi
		Dakshit Shah	
		Jaimin Shah	
		ShwetaJoshi	
		Manavi Jain	
		Dhanvi Choksi	



Our respected Head of Department, Dr. Amit A. Deshmukh announced the winners to a roaring applause from the participants. Dr. Deskhmukh encouraged students to innovate further and focus on the practical implementation of their future projects. Both the judges were thanked extensively by the present IETE-SF committee, with the DJ Strike proceedings being unveiled by our respected judges. Finally, all the strike faculty co-ordinators Prof. Yukti Bandi and Prof. Ameya Kadam were thanked, and thus DJ Strike 2022 came to a close.

Photographs from the event:







DJ SPARK 2022

ABOUT SVKM'S DJSCCE

Shri Vile Parle Kelavani Mandal "SVKM" to the society at large grew out of a humble seed planted during India's freedom movement namely by Shrimati Gokalbai Punamchand Pitamber High school - to nurture socially relevant education. Today SVKM has grown into a mega education nucleus with distinguished achievements. It has developed 50+ vibrant institutions covering a wide range of educational and social need thus educating more than 55,000 students, who are currently pursuing carriers from school to post-graduations and super specializations, thus catapulting SVKM into an institution of global relevance and high caliber. Dwarkadas J. Sanghvi College of Engineering (DJSCCE), established by SVKM in 1994 offers graduate programs in the fields of Electronics and Telecommunication, Information Technology, Computer, Mechanical, Computer Science And Engineering (Data Science), Artificial Intelligence and Machine Learning, Artificial Intelligence and Data Science, Computer Science and Engineering (IoT and Cyber Security With Block Chain Technology), Chemical, Electronics, Production and Biomedical Engineering. The college runs Post graduate and Doctoral programs in fields of Mechanical, Computer and Electronics and Telecommunication Engineering. Today, DJSCCE has grown into a premier institute of technical education and has a stimulating educational environment with distinguished faculties and state-of-the-art facilities.

IMPORTANT DATES:

Last date for Project Paper submission - 26th February, 2022
 Acceptance notification - 10th March, 2022
 Last date for paper submission (Accepted Projects) - 19th March, 2022
 Date of Project/Model Demonstration - 11th April, 2022



NATIONAL LEVEL PROJECT COMPETITION

Project Paper Format: IEEE 2 column format, maximum 8 pages.
Paper should contain: Introduction, Concept, Literature Survey, Block Diagram and Working Principle, Implementation, Application, Future Scope, Reference List.

Win Exciting Prizes

Email technical papers to:- djsparkpapers2022@gmail.com

Participation Certificate to all participating teams.
 Selected technical papers for projects will be published in the ONLINE proceedings of DJ Spark 2022 with ISBN number. The selected projects will be called for demonstrations on the competition day. The event will be conducted in accordance with covid norms from the government. In April. Online participation for oustation candidates is possible.
 Registrations Fees (For Shortlisted Projects):

No. of participants per group	IETE Members	Non-IETE Members
1	₹250 /-	₹300 /-
2	₹450 /-	₹500 /-
3	₹650 /-	₹700 /-
4	₹850 /-	₹900 /-

Registration fees will cover Lunch expenses and Certificate. For more information refer website: www.djsceietestf.com

OBJECTIVE

DJ Spark 2022 aims to encourage students, who are eager & passionate to learn and implement ideas in the form of Technical projects. Students can make utmost use of this platform to broaden their horizon in their respective field of interest and present it with the same conviction. The project competition aims at projects from undergraduate and postgraduate levels from various Engineering Colleges across India.

SOME TOPICS (NOT RESTRICTED TO)

Communication theory and Systems
 Information theory
 Coding theory
 Optical Communications
 Microwave Communications
 Green Communications
 Next Generation Networks
 Satellite Communications
 Optical Networks and Systems
 Ad hoc Networks
 Wireless and Wireline Networks
 Complex Networks
 VoIP/ IPTV
 Signal Processing for Communications
 Image Processing
 Video Signal Processing
 DSP Algorithms and Architectures
 Speech and Audio Processing
 Language Identification
 Machine Learning
 Large Dimensional Signal Processing
 VLSI Design and Integrated Circuits
 Internet of Things (IoT)

For further details, Contact : Aayush Gandhi : +91 9324445685 Jaimin Shah : +91 9833988968 Akshat Somani : +91 93223287462

Date: 11th April 2022

Participants: 40+ teams from across India

Objective:

- Students developed a systematic approach towards their respective project topic
- Equipping students with technical paper writing and research abilities
- Upskilling students on project presentation and towards making the leap from project to product

Contents:

DJ Spark is an annual project-based national level competition where students are provided with an opportunity to showcase their technical skills and compete at multiple fronts with other students from all across India. In order to participate in DJ Spark, one has to send across a technical paper of any on-going project or any other project idea that they aim to execute. After sending the IEEE format technical paper at the mentioned email address,



they will be subjected to scrutiny and assessment by the faculty of the EXTC department. The short-listed teams will then be given a chance to exhibit their projects at our very own college. In addition to this, their project will also be assigned an ISBN Number, irrespective of whether the team wins the competition, which holds immense value during the course of engineering. On the contrary, those who win the competition are awarded cash prizes and other exciting prizes. DJ Spark proves to be an inspiration to budding engineering students and gives them an incentive to expand their knowledge, indulge in application-based learning and flourish. It encourages students to step outside of their comfort zones and build something innovative, catering to an array of applications and at the same time bringing about a change in the world.

This year, DJ Spark was held on the 11th of April 2022. The Chairperson of DJSCE IETE-SF, Adrika Singh inaugurated the IETE-SF's awaited flagship event with a warm welcome speech, highlighting the year IETE-SF 2021-22 has had and how the transition from online college to offline college has been. After her welcome speech, Adrika introduced Dr. Anuja Odhekar, IETE-SF's Branch counsellor to the stage. Dr. Odhekar introduced our eminent judges for day, Dr. Sandeepak Kakatkar and Dr. Ninad Mehendele.

Post Dr. Odhekar's speech which was received with great applause, she introduced our honourable Principal Sir of DJSCE Dr. Hari Vasudevan along with Dr. Manali Godse and Dr. AC Daptadar, the college's eminent Vice-Chairpersons to the stage. Dr. Vasudevan during his address to the waiting participants and audience talked about the legacy of DJ Spark over its span of 11 years and how for the first time this year the event has gone onto a national scale receiving submissions from BITS Goa and other institutes throughout India. After his address, the much-anticipated DJ Spark and DJ Ignite magazines were unveiled to the enthusiastic participants and audience.

Initially more than 45 papers were submitted to DJ Spark for consideration and then after rigorous review, evaluation, and gradation, 26 papers were shortlisted for the competition. Projects from within Mumbai were invited to DJSCE to present their projects online while teams present outside the college were invited to present their projects in online mode for the first time ever.

After deliberation and judging each project meticulously the judges announced the winners of the competition. The winning papers and the respective teams are listed below. A total of Rs. 24,000 was given to the winning teams, with emphasis being placed on project to product induction.



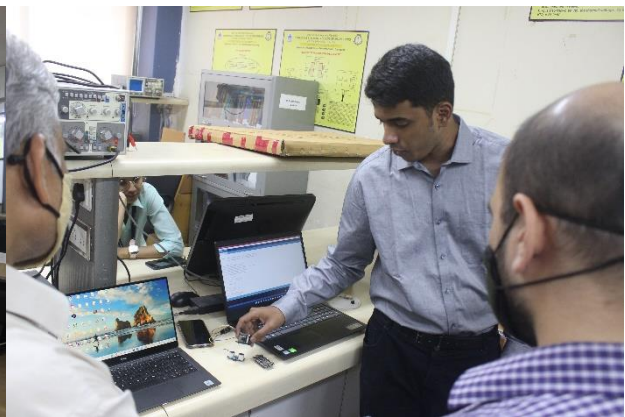
Position	Paper Name	Members	Faculty Mentor
1	Automobile Accident, Prevention, Detection, Reporting System, and communication using Li-fi technology	Dhwanit Pandya	Prof. Yukti Bandi
		Durvang Parab	
		Dhaval Solanki	
		Maahi Trivedi	
		Niharika Damodaran	
		Mohammed Owaish Khumar	
2	Crowd Monitoring System	Yash Dange	Prof. Tushar Sawant
		Srihari Kamath	
		Rahil Shah	
		Devesh Agarwal	
		Nihal Shaikh	
		Mohammad Sadiq Khan	
3	Autonomous Bot Using ROS, LIDAR, Raspberry Pi with A QR Code Based Smart Parking System	Aarushi Raichur	Prof. Ameya Kadam
		Sakshi Jain	
		Urja Shah	
3	Design of Wideband Antenna for Small Range Ultra - Wideband Communication	Parth Salia	Dr. Amit A. Deshmukh
		Tanay Mehta	
		Urvil Shah	
		Yatrik Mehta	



Outcomes:

- The students became aware of practical applications in the field of electronics and telecommunication.
- Students from various departments and colleges came together to piece up a single project.
- Students explored various other research papers and improved their project work under the guidance of their mentors

Photographs from the event:





FACILITIES PROVIDED BY IETE-SF

BOOK BANK

IETE-SF provides the students with a book bank facility where they can issue reference books at nominal rates for the entire semester. Students who want a better insight into the subject avail this facility as these reference books aid in developing a good understanding of the topics and enable them to consolidate their foundation of the subject

COMPONENT BANK

IETE-SF provides a component bank facility where students can borrow electronic components which they require for executing multiple projects both in and outside of the curriculum. They can utilise the facility by initially paying 50% of the cost and getting a refund of 20% on returning the components, provided that they are undamaged.



Introduction to IoT

Speaker: Ms Shweta Chavan

Date of the event: 10th October, 2021

Number of Participants: 130+ Second- and Third-Year Students

Objectives of the activity:

- To understand the need for IoT
- For the attendees to gain better insight into the advantages and changes that IoT will have on our world.
- The study of simulation software and the basic components that make up IoT

Contents:

“If you think that the internet has changed your life, think again. The IoT is about to change it all over again!” — Brendan O’Brien, Chief Architect & Co-Founder, Aria Systems. The Internet of Things (IoT) describes the network of physical objects— “things”—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. The internet of things helps people live and work smarter, as well as gain complete control over their lives. In addition to offering smart devices to automate homes, IoT is essential to business. IoT provides businesses with a real-time look into how their systems really work, delivering insights into everything from the performance of machines to supply chain and logistics operations.

Therefore, to make students aware of the network of physical objects; IETE-SF Conducted a Session "Introduction to IoT". The Session took place on 10th October 2021 and was a roaring success with over 120 participants attending the event. The Session started with good enthusiasm among the attendees to gain a good hold for IoT under the guidance of the Speaker.

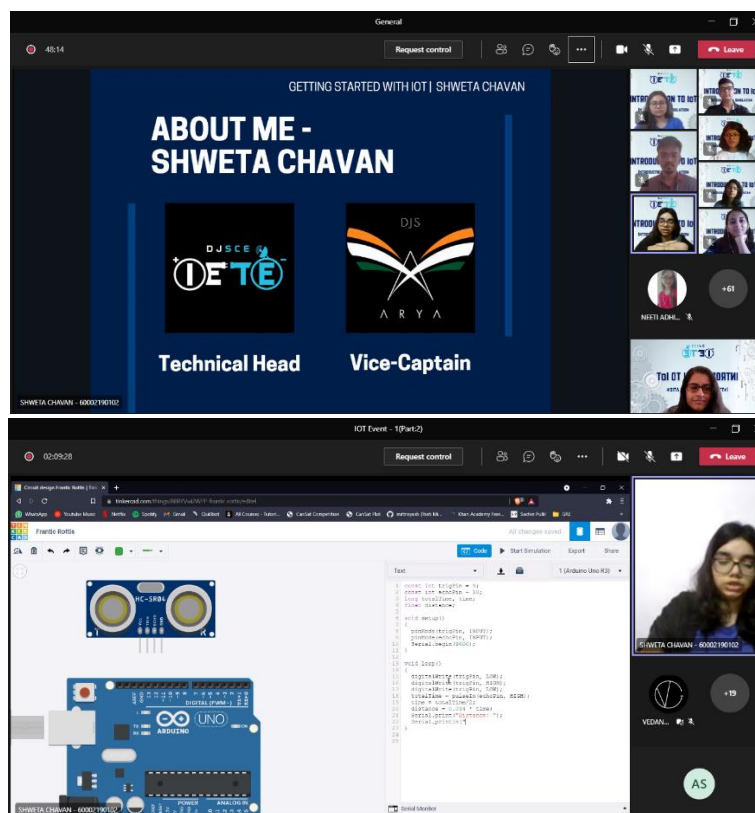
Firstly, the speaker for the day, Shweta Chavan, introduced herself sharing her experience in the field of IoT and her experience working in DJSCE EXTC’s various committees. The speaker explained and made the attendees revise their basics of electronics covering topics like current, diodes and microprocessors, explaining what actually a Diode is and how it works and deeply explaining two types of diode LED and Zener.

Completing the basics of electronics, the speaker moved to some exciting topics of IoT covering the Arduino UNO board and other microprocessors and controllers. The speaker first explained their various types and differences making the students aware of what they will be working with later on in their careers. The speaker then came on explaining UNO. “UNO is like when you start learning IoT this is a go-to place” Ms Chavan was quoted as saying. The speaker showed what a real UNO looks like and gave the attendees practical experience of using the microprocessor with simulation software.



The speaker then taught them preliminary circuit designing with Arduino and how to program the board to their own advantage. The students were then asked and assisted to do the same using the simulation software TinkerCAD. Introductory code and simulation of ultrasonic sensors were also taught with Ms Chavan explaining the importance of coding towards your own output. Practical knowledge was given to the students through this simulation explaining the use of various sensors and CROs as well. Finally, the event came to an end, with a quick question and answer session. The speaker was thanked by the various faculty members present for this insightful lecture and then by the present IETE-SF committee hosts and members.

Photographs of the Event:



Outcomes:

- Students and attendees became more aware of the need for IoT, its advantages and changes around the world that it imparts
- Students are well versed with potential uses of Arduino, Ultrasonic sensors and online simulation tools
- Students can implement this knowledge in their future endeavours and become better employable, more rounded individuals
- Attendees also became aware of various microprocessors, microcontrollers, CRO and



how to simulate these components

IoT for Everyone: An Immersive IoT Workshop **Basics of IoT by Prof Shivani Bhattacharjee**

Speaker: Prof Shivani Bhattacharjee

Association of the Speaker: Assistant Professor, DJSCE Mumbai

Date of the Session: 15th November, 2021

No. of Participants: 20+ SE Students

Contents:

“The Internet of things is about empowering computers....so they can see, hear and smell for themselves” ~ Kevin Ashton (Inventor of the term Internet of Things) IoT-Internet of Things, The Internet of Things (IoT) describes the network of physical objects—“things”—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. The internet of things helps people live and work smarter, as well as gain complete control over their lives. In addition to offering smart devices to automate homes, IoT is essential to business. IoT provides businesses with a real-time look into how their systems really work, delivering insights into everything from the performance of machines to supply chain and logistics operations.

Therefore, to make students aware about the network of physical objects the IETE-SF Conducted a Session "IoT for Everyone". The aim for Day 1 was a general introduction to IoT. The Session took place on 15th November. The Session was very informative and interactive for the attendees. The Session started with good enthusiasm among the attendees to gain a good hold for IoT under the guidance of the Speaker. Firstly, the speaker introduced herself sharing her experience in the field of IoT. The speaker then proceeded to show us a general video about IoT.

The professor broke the session into seven parts; starting with IoT domains, she explained that there are many IoT domains like Home, Transport, Community, National, Personal Use etc., with a lot of them being sub domains to one another. Then the speaker explained to us the History of IoT and let us know how far we have come from 1st generation to the current i.e. 4th generation.

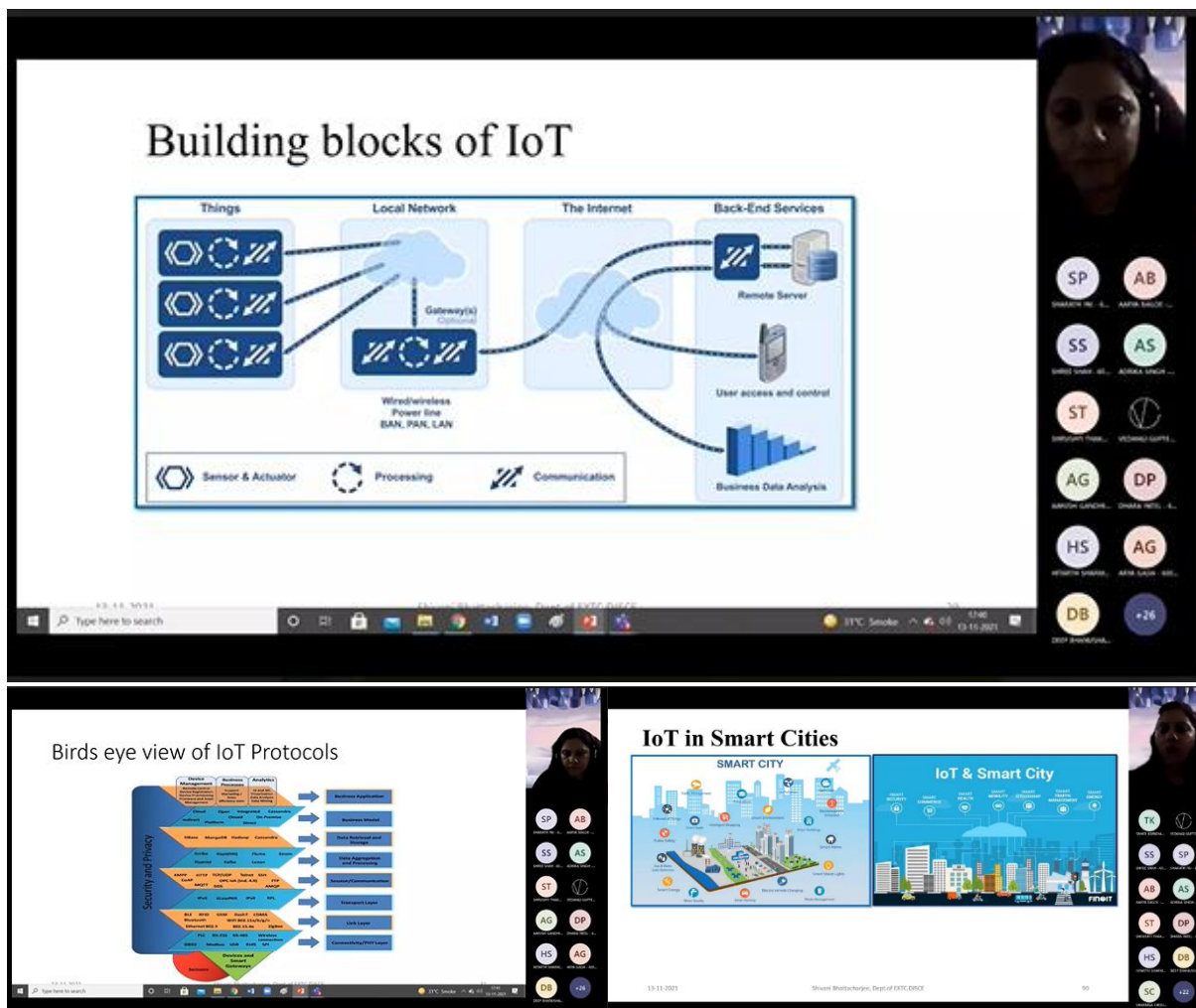
The speaker then explains how IoT works. Internet of things is not a single novel; instead, several complementary technical developments provide capabilities that are taken together to help bridge the gap between the virtual and physical world; and went on to explain to us about the building blocks of IoT. Basic building blocks of IoT are End devices/Node, Gateway/local processing nodes, Connectivity, Cloud-based application and storage.

Next on the agenda was IoT stacks. It has four layers namely the application layer, management layer, communication layer, sensing layer. Next was IoT Spectrum. The speaker then explained the spectrum needs of IoT and what frequency they fall under.



IoT protocol was next, this was explained with various IoT protocols and examples in tow. For example, RFID, Bluetooth, Zigbee etc. The experienced professor also gave us brief examples of home automation with examples like if someone is outside and wants their room to be cool, they can switch on their AC with the help of their phone. Lastly, the professor explained the applications of IoT. Some of them are smart metering, logistics, transportation, e-health, smart cities etc; which were explained in detail in this part. Our representative from IETE thanked ma'am for a wonderful and informative session.

Photographs of the Event:



Outcomes:

- The students understood the need for IoT and how it works.
- They further understood how IoT works, its architecture and building blocks. Thus, gaining an understanding into the core of this emerging technology
- The speaker further discussed the spectrum, IoT stacks and protocols with detail. Giving



insight into how various devices connect to one another

- The participants also understood discussing use cases and applications of IoT

IoT for Everyone: An Immersive IoT Workshop

IoT and Embedded Systems

Speaker: Prof. Ninad Mehendale

Association of the Speaker: Assistant Professor, K. J. Somaiya College of Engineering

Date of the event: 27th November, 2021

No. of Participants: 20 Second Year students

Contents:

“The Internet of things is about empowering computers....so they can see, hear and smell for themselves”~ Kevin Ashton (Inventor of the term Internet of Things)

Embedded systems are microprocessor-based hardware systems which have become an integral part of the devices we use in our day-to-day life. They are those computer systems that do not look like computer systems to the everyday user. They form a part of a larger system or product, ranging from a simple mobile phone to tedious medical devices, agricultural farming and manufacturing equipment as well.

Therefore, to make students aware of the network of physical objects IETE-SF conducted a Session "IoT for Everyone". The aim for day was a general introduction to IoT. The Session took place on 27th November. The Session was very informative and interactive for the attendees. The Session started with good enthusiasm among the attendees to gain a good hold for IoT under the guidance of the Prof. Ninad Mehendale.

The professor then commenced the session by introducing the different programming languages required to understand the role of Embedded Systems for IoT. He explained all the required content from C, C++, PYTHON, etc. The speaker also gave a brief description on JAVA, HTML and how they are not suitable for Embedded Systems. This helped the students to comprehend the in-depth insights of programming languages and their core motives related to Embedded Systems.

The students were then briefed about the different types of sensors and how the sensors are used and operated. He commenced by explaining core sensors like Temperature, Infrared, Humidity, Smoke, Track, Colour and Accelerometer. The most used and famous core sensors were presented in a picture format. Further, the details regarding the most used sensors were explained. Part one of the session, henceforth terminated by displaying the top 10 famous IoT Boards.

In part two of the session, Professor Mehendale began with the explanation of the “Architecture of Embedded Systems”. This was considered as the most crucial part of the session. The data flow movement in Embedded Systems and Digital Block diagrams were also simplified in the session.



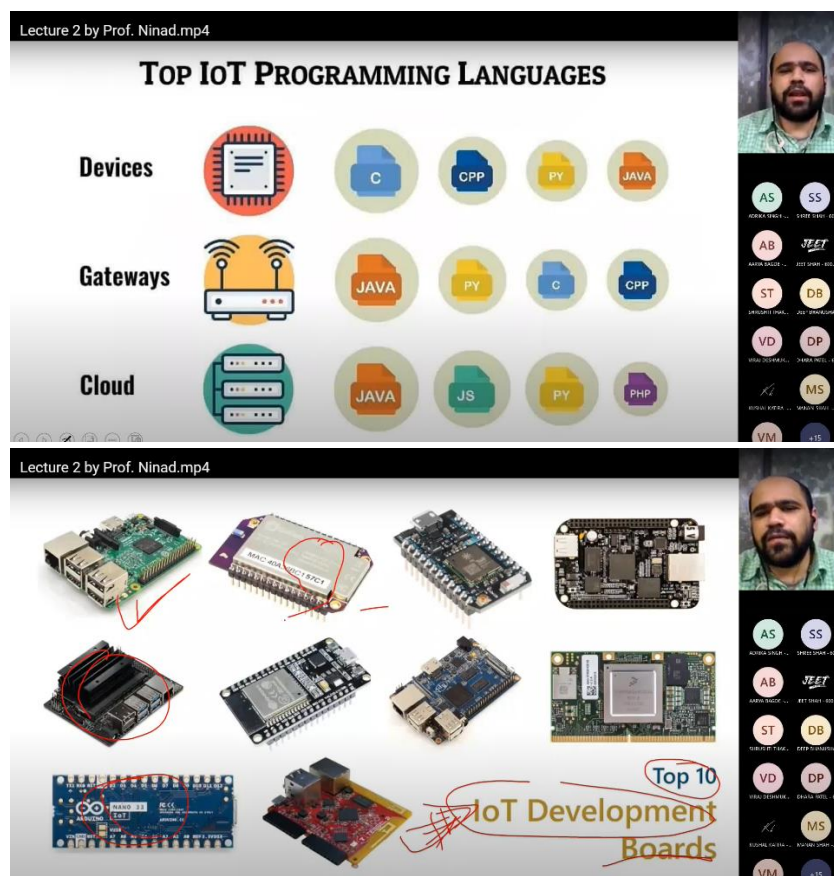
Next, the two types of Embedded Systems were explained, which are completely based on Performance and Functional Requirements or on performance of the microcontroller.

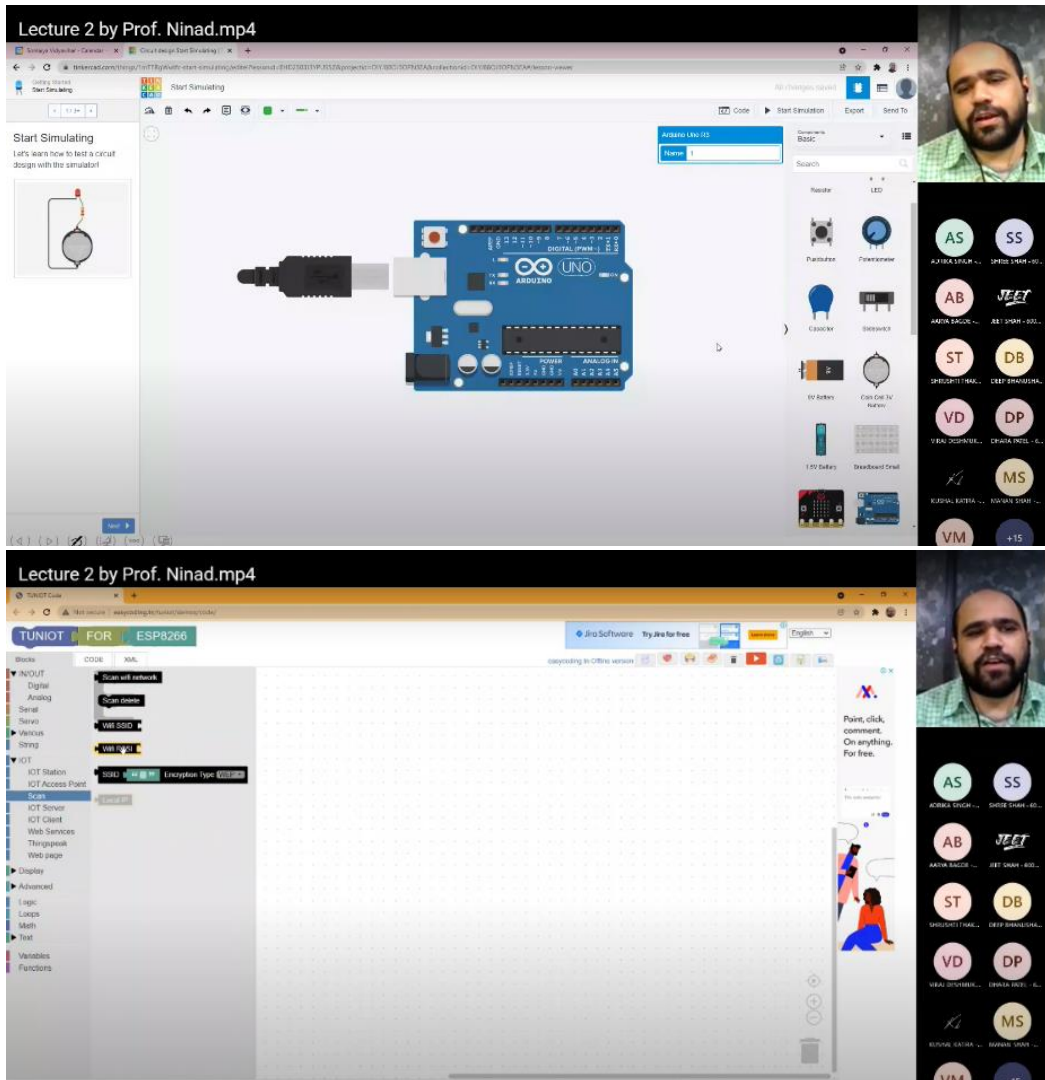
Further the participants were then explained the use of microcontrollers by the speaker, as he unfolded the difference between a microcontroller and a single-based computer. After that, the processing unit, RAM, onboard storage, reboot time and more quantities for both the equipment was explained in detail.

Right after the termination of the theory required, the professor started off with the practical implementation of the concepts. Two software were introduced to the students out of which the main one was 'TinkerCad'. Students learnt about objective of working with Tinkercad enhanced the students' knowledge as he went on to implement interfacing circuit and general block coding language (the highest level programming language used) . Later, the Arduino board and different sensors were used along with simulation to understand the functionality. The speaker terminated the session by briefing the students and guiding them on Block Coding.

This informative session came to an end with a Question-and-Answer round after which the IETE-SF hosts solicited the presence of Professor Ninad for giving his valuable time towards imparting his expertise to the participants present.

Photographs of the Event:





Outcomes:

- The students understood the need for Embedded Systems in IoT and its implementation.
- The detailed architecture and building blocks helped the students to understand the core of this emerging technology.
- Finally, the event ended with Prof. Ninad Mehendale teaching the students the basic implementation methods for IoT and Embedded Systems.



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IoT for Everyone: An Immersive IoT Workshop **IoT and Artificial Intelligence by Prof. Archana Chaudhary**

Speaker: Prof. Archana Chaudhary

Association of the Speaker: Assistant Professor at DJSCE.

Date of the event: 8th December, 2021

Participants: 20 Second Year Students

Objectives of the activity:

- To study the domain of AI and how machines can be controlled
- For the attendees to gain better insight into the implementation of Artificial Intelligence on our daily lives and in the field of IoT
- To study the types of AI and the methods used for its implementation

Content:

Artificial intelligence is the theory and development of computer systems to be able to perform tasks normally requiring human intelligence such as visual perception, speech recognition, decision making and translation between languages.

The Internet of Things (IoT) describes the network of physical objects— “things”—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. The internet of things helps people live and work smarter, as well as gain complete control over their lives. In addition to offering smart devices to automate homes, IoT is essential to business. IoT provides businesses with a real-time look into how their systems really work, delivering insights into everything from the performance of machines to supply chain and logistics operations.

Therefore, to make students aware of the network of physical objects the IETE-SF Conducted a Session "IoT for Everyone". The Session took place on 15th November. The Session was very informative and interactive for the attendees. The Session started with good enthusiasm among the attendees to gain a good hold for IoT under the guidance of Prof. Archana Chaudhary. Firstly, the Speaker introduced herself sharing her experience in the field of IoT.

She explained and made the attendees Revise their basis, once the revision of the basics was done the speaker proceeded with explaining what is AI and gave a few examples of AI like how Google Translates entire web page in a matter of seconds or how photo gallery groups images based on the location or how it is used in smartphones, self-driving cars, gaming, banking etc. she then explained us the composition of intelligence. She explained how reasoning (The set of processes that enable us to provide basics for judgment, making decisions and prediction) , learning (it is the activity of gaining knowledge or skill by studying, practising, being taught or experiencing something), problem-solving (The process in which 1 perceives and tries to arrive at the desired

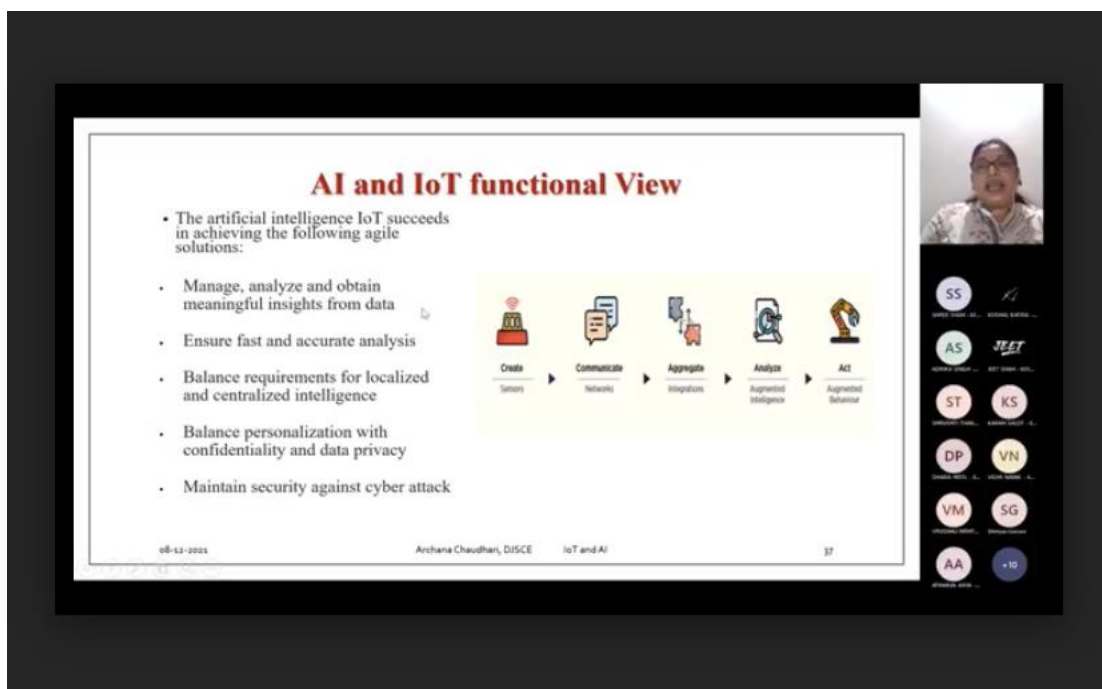


solution from a present situation by taking some path which is blocked by known or unknown hurdles), perception (The process of acquiring, interpreting, selecting and organising sensory information) help to compose intelligence etc.

Ma'am then proceeded to explain the types of AI and how the two types are divided further into more types. She then explains how type-1 is further divided into 3 parts: narrow AI, general AI and strong AI and how type- 2 is divided into other four parts: reactive machines, limited memory, theory of mind and self-awareness. She then proceeds to explain every part in simple detail. She then proceeded to explain the domains of AI like deep learning, machine learning and artificial intelligence and then she showed us the general structure of ANN. She then explained to us how a machine can be trained in different methods like supervised learning, unsupervised learning and reinforcement learning. She explained to us what an expert system is, which is an AI-based computer system that learns and reciprocates the decision-making ability of a human expert and how they use if-then logical notations to solve complex problems, they are mainly used in information management medical facilities and soon. Further ma'am explained AI and IoT functional view and AI benefits. She helped us by explaining how we can use Coursera, IBM machine learning, Google Cloud, AI platform, spells and neural designer to start AI projects.

Ma'am ended the lecture by explaining to us the future scope. The lecture was very insightful and helped me gain knowledge in parts of AI and IoT. I would love to attend more lectures like this. The speaker was thanked by various faculty members present for this lecture and by the present IETE-SF committee hosts and member

Photographs of the Event:





Deep Learning

- Deep Learning is the process of implementing Neural Networks on high dimensional data to gain insights and form solutions. Deep Learning is an advanced field of Machine Learning that can be used to solve more advanced problems.
- Deep Learning is the logic behind the face verification algorithm on Facebook, self-driving cars, virtual assistants like Siri, Alexa and so on.

08-12-2021 Archana Chaudhari, DISCE IoT and AI 25

Outcomes:

- Students and attendees became more aware of how artificial intelligence works and its applications in their daily lives
- Students are well versed with potential types of AI and how machines are trained using them
- Attendees also became aware of various domains AI comprises of and the vast projects that can be considered under this field



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IoT for Everyone: An Immersive IoT Workshop

IoT and VLSI by Dr. Poonam Kadam

Speaker: Dr. Poonam Kadam

Association of the Speaker: Assistant Professor, DJSCE Mumbai

Date of the event: 30th December, 2021

No. of Participants: 20 SE students

Objectives:

- To learn about VLSI Methodology, the design Process used in VLSI, Frontend and Backend designs in VLSI.
- For participants to become familiar with MOSFET Structure and its applications, digital VLSI, Low Power VLSI and fabrications; along with learning about languages of programming like VHDL, Verilog, etc.

Contents:

IETE-SF, the student chapter of Electronics and Telecommunications Department organised the final leg of their seven-week workshop, IoT for Everyone: An Immersive IoT workshop by inviting the respected Dr. Poonam Kadam to speak on VLSI on the 30th of December 2021.

The session started off with the events team of IETE-SF introducing the speaker and telling the students about Dr. Kadam's vast teaching experience as she holds an MTech Degree from the prestigious IIT BHU in Electronics Engineering and has recently completed her PhD in Electronics & Telecommunication Engineering from University of Mumbai on the Topic "Design and Analysis of Broadband and Multiband Antennas using Defected Ground Plane Structure."

Dr. Kadam started the workshop with a brief explanation of what a VLSI is, explaining the discrete component required and briefed the students about why Integrated Circuits (IC) were developed. The professor went on to explain the classification of IC based on number of the logic gates present and showed the evolution in the field of ICs with Moore's law. then went on to the design Methodology showing the differences in both the full-Custom design and Semi-Custom Design. Ma'am then explained the VLSI Design flow which included Design Specification, Architecture design, Gate Level Design, Circuit level Design, HDL coding, Simulation, Verification and Meets Specification (if not HDL coding) and lastly Fabrication.

The VLSI Design is Divided into two parts the Frontend Design and the Backend Design and explained how Frontend and Backend Actually works. The frontend encompasses Design verification via Simulation and Backend involves Fault Simulation and Physical Design. The professor talked about how Silicon IC technologies are developed by using either Bipolar process or by MOS process and then went on to elaborate the MOS process with diagrams and classifications. For working of these transistors, ma'am explained that the students need to apply



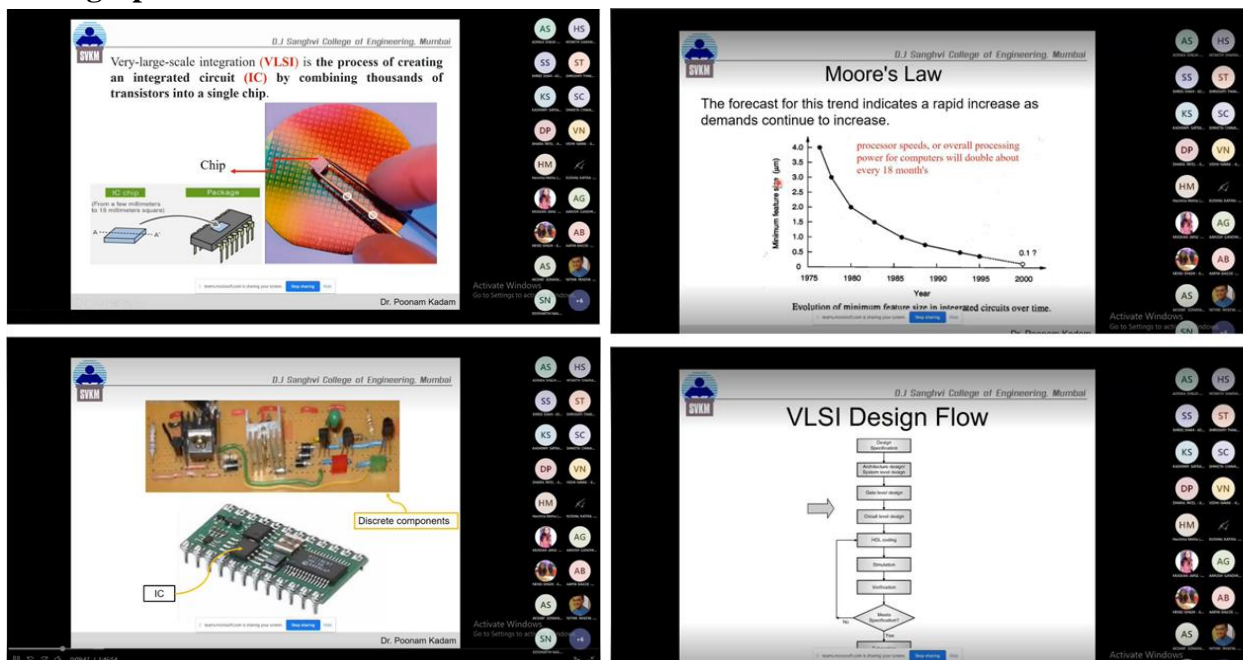
a gate voltage which was explained with the help of Threshold Voltage concept and explained the mode in which the transistors must be kept and the working of voltage.

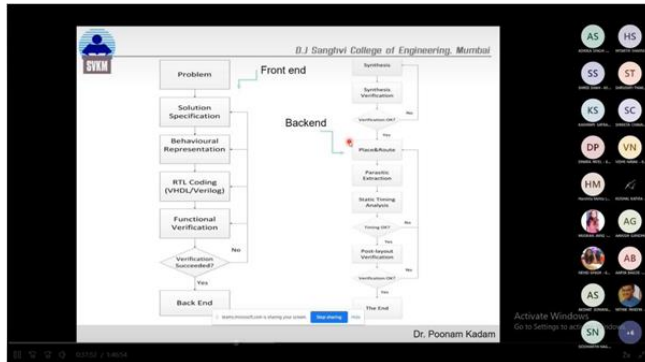
The speaker made the students work on finding the current required through equations and calculations and went on to the next topic which was Current Determinator. Firstly, explained the variables used in the determinations and then proceeded through the calculations. The next important concept was to find Channel length modulation and plot the graph for long channel I-V plots. She found of Current modulation for PMOS transistors. She later went through the threshold drops in the circuits.

Finally, Dr. Kadam went to on to explain the very important concept which defined the digital IC i.e., Noise margins and Voltage transfer characteristics. Further on the resistive load inverter was discussed along with the components of power and its dissipation. The speaker talked on the leakage Control circuits which included the explanation of sleep transistors, dual threshold voltage CMOS, body biased transistors, supply voltage scaling and transistors stacks. The professor also discussed the dopant diffusion method and the Ion implantation methods. Lastly, the students learnt about the Hardware Description Language which included VHDL and Verilog, etc. and discussed them in detail. The workshop ended with the discussion on the Level of Abstraction and the VHDL code for the half adder.

Dr. Kadam was then thanked by the Vice-Chairperson of IETE-SF, Adrika Singh for taking our her valuable time and sharing her knowledge to the students present in the workshop. Students gained a lot from this workshop and it helped them to develop their knowledge in the field of VLSI.

Photographs of the Event:

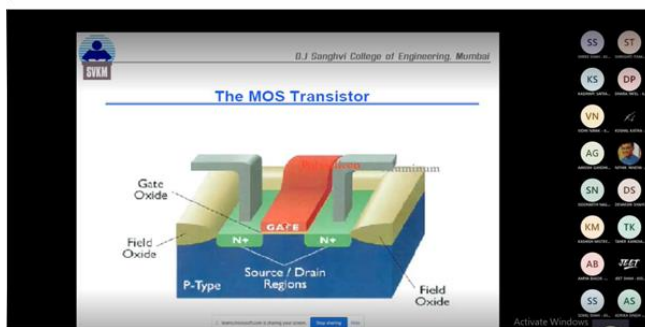




Ion Implantation

- In ion implantation, dopant atoms are accelerated toward the substrate surface and enter due to their kinetic energy.
- This is the preferred technique for introduction of dopant atoms since the amount of lateral diffusion is much lower.

The diagram shows a cross-section of a substrate with an n-type region. Accelerated Boron atoms (represented by green arrows) are shown entering the surface. The substrate is labeled "n substrate".



Dopant Diffusion

- Dopant can be introduced into the substrate through diffusion.
- Diffusion is a general physical process which drives particles down a concentration gradient.
- The substrate is heated in the presence of dopant atoms, which then diffuse into the substrate.
- Diffusion may also occur into other layers which are present such as silicon dioxide.
- Large amount of lateral diffusion also occurs.

The diagram shows a cross-section of a substrate with an n-type region. A concentration gradient of Boron atoms is shown above the surface, with arrows indicating "diffusion" into the substrate. The substrate is labeled "n substrate" and "heat" is shown at the bottom.

Outcomes:

- Basic concepts of about VLSI were understood by the students and designing in VLSI was explained in dept
- The students were made familiar with the frontend and backend designing in VLSI.
- The students were introduced to the programming languages like VHDL, Verilog, etc.



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IoT for Everyone: An Immersive IoT Workshop

IoT and Cloud Computing

Speaker: Ms. Roma Jain

Association of the Speaker: Senior MLE at iSchoolConnect

Date of the event: 8th December, 2021

Participants: 20 Second Year Students

Objectives of the activity:

- To study the domain of cloud computing and its benefits
- For the attendees to gain better insight into the implementation of Cloud Computing on our daily lives and in the field of IoT
- To study how to access data and the methods used for its implementation

Content:

“Cloud computing is not only the future of computing, but the present and the entire past of computing” - Larry Ellison.

With this quote in mind, IETE-SF, the student chapter of the Electronics and Telecommunications department organised their fourth lecture in the IoT for Everyone: An Immersive IoT Workshop. The workshop was taken by Ms. Roma Jain, a senior machine learning engineer at iSchoolConnect, with a vast array of experience under her arsenal from companies such as UpGrad, Jio and CereLabs.

The workshop began with the events team of IETE-SF introducing the esteemed speaker and Ms. Jain giving the attendees a brief synopsis of what she was going to cover. We then moved onto learning what cloud computing is, with Ms. Jain explaining how it provides on demand functionality to the consumer as it is neither public or private and is an Internet service instead. Further the students learnt about the three terms in the technical world related to cloud computing, namely: IaaS, PaaS, and SaaS.

The speaker then continues to explain why we need cloud computing and explained the benefits of cloud computing and why various industries are adopting this technology over its other old-fashioned counterparts. Ms. Jain explained how it reduces cost and increases scalability, and how cloud computing helps in meeting fluctuating demands and scaling as per consumer needs.

We then moved onto practical examples of cloud computing and how they worked, with the speaker explaining how the things work actually like automated scaling listeners and hypervisor; she explained that the workload status information is monitored and virtual servers are added or removed, accordingly using this information heartbeat messages are sent by the servers to the monitors to check their health. LiveVM integration, elastic disk provisioning pattern, load balancers are the core concepts that were explained briefly and Ms. Jain then discussed the diagram



of elastic disk provisioning and how it is applicable in the vast domain of cloud computing. Further, the students then there are two types of scaling horizontal and vertical and how it is better to use horizontal scaling than vertical scaling as vertical scaling has only one server and it can go down anytime and with a single point of failure. While horizontal scaling on the other hand has multiple servers to rely on.

Ms. Jain then explained what a hypervisor is and how to access data by customizable control panels. Finally, the students learnt about the cost of cloud services and which service would best suit a customer and their needs of configuration. "There are easy commands to download data uploaded to the cloud," Ms. Jain elaborated, further explaining how many companies use cloud computing and how important it is as leading companies like Netflix, Twitter, eBay all rely on cloud computing. It was also mentioned how some companies like Facebook and Apple are reported to be off cloud and building in house data centres due to security concerns still prevalent in the industry.

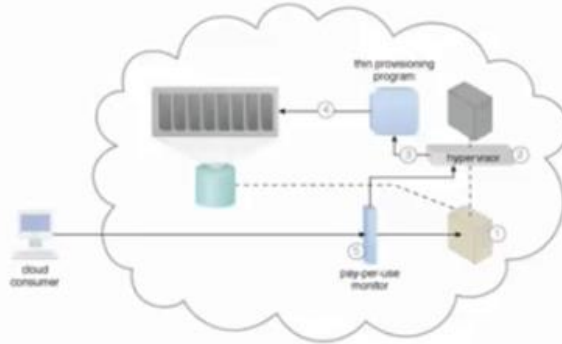
Ending the workshop, Ms. Jain was thanked by the events department of IETE-SF for gracing the students with her presence and taking out her valuable time. The lecture was very insightful and educational, the students were also quoted as saying. With this the lecture came to a successful end.

Photographs of the Event:





Elastic disk provisioning



Outcomes:

- Students and attendees became more aware of cloud computing and its benefits
- Students are well versed with potential types of cloud computing and how companies and individuals utilise this technology
- Attendees also became aware of practical use cases of cloud computing and its real-life applications in leading companies



IoT for Everyone: An Immersive IoT Workshop **Workshop Report**

Speakers: Sachin Singh Bhadoria, Rushabh Nagda, Satvik Deshmukh

Association of the Speakers: BE student mentors, DJSCE

Date of the event: 14th of November to 23rd of December 2021

No. of Participants: 20 Second Year Students

Objectives:

- For students to learn how to construct a Security-Camera with Esp32 Cam, PIR and Telegram Bot
- To understand the basics of Python and how to operate your own camera using Python code
- To become well versed with making a bot in Telegram and the study of ESP and its functions

Contents:

“Knowledge is of no value unless you put it into practice” - Anton Chekhov

With the above quote in mind IETE-SF, the Student Chapter of the Electronics and Telecommunication Department organised IoT for Everyone: An Immersive IoT workshop. This was a 7 weeklong event, spanning five workshops delivered by BE mentors along with five lectures from esteemed speakers on the topic of IoT and its many aspects.

Through this event students could learn how to implement various aspects of IoT not only in theory but also practically through project making, giving them hands on knowledge with the various components associated with IoT such as ESP32, BMP280 sensor and many more components.

The first workshop was conducted on the 14th of November 2021, with IETE-SF's events team spearheading the gracious welcome of the mentors for this workshop. Our mentors helped the students in downloading Anaconda along with teaching them how to set up Jupyter notebook for the purpose of Python programming. The mentors broke the session into parts for better understanding of the project topic at hand. First is Python Basics. In this part, the mentors started with operators, data types and variables. They explained some examples of operators are + - * and examples of data types are float, int, char, further explaining that as far as variables are concerned those are normal words or alphabets.

Next is the mentors explained flow control, teaching the students about booleans, which are either True or False. Logical operations such as and, or, not and their truth table, along with an If-Else loop were explained. The mentors gave us key advice for tackling indentation errors by using tab or spacebar in python. Further, loops were being introduced where they gave us insights on how



to use FOR and WHILE loops and described the advantages and disadvantages of using both loops. Furthermore the mentors showed the students how to use python to full capacity by using its code reusability and far reaching repositories available online to their advantage. They then explained List in python, explaining its index and their naming conventions for the language. Dictionaries were then explained, with students understanding key value pairs and their practical usability. Subsequently Numpy library and OpenCV were explained, using images and videos to explain the various functions and procedures to bring about different results using these libraries; usually these libraries are used for matrix making and operations. The mentors also taught us about the different types of arrays such as 1D arrays, 2D arrays and 3D arrays, explaining pixels and how they work. The students also learned how to draw borders on existing images and make an image negative, along with using facial recognition through the student's web cameras.

The second week of the workshop was on the 21st November 2021. At the start of the session the mentors gave a recap of the first week of the workshop, covering Python basics briefly and informing the students about face recognition using Python. They explained how facial recognition has three parts, namely detection, recognition, and segmentation

Sachin explained how detection means to check whether there is a face or not in the given picture and how to locate the face using Python's OpenCV library. For facial detection, the students were taught how to embark on a more detailed Machine Learning journey if they were interested, with the mentor explaining how ML uses images, videos, and other media to work using deep learning. The mentors then showed us a code on face detection and gave us insights about machine Learning and how the computer is able to make a model successfully. Thus, explaining the basics of the project at hand.

Once the facial detection code had been successfully completed by the students, the mentors then started teaching the students how to make a bot in Telegram. They used "BotFather" to make bots for telegram, editing features and customizing the bot to our requirement. The students then cleared their doubts about Telegram and how to successfully get a reply on the app when using their facial recognition system.

Week 3 and 4 of the workshop focused on implementing the hardware components of the workshop and were held on 28th of November and 12th December 2021. The lecture started of by participants opening their ESP Packet and learning about the various parts of the ESP and BMP. Our mentors started explaining the various connections present in the components and their various uses, using real life scenarios for easier understanding. Furthermore, Arduino coding was explained, teaching the students how to connect their ESP to their PCs and code successfully. Basic programs were taught to the students, and then the mentors moved onto making the project at hand, sharing code from Arduino to ESP using Port. They opened the Camera Web Server code which starts the ESP CAM and explained how the students could use this in their future projects as well. For better understanding and to clear all doubts present in the participants' minds, an interactive video was shown so that students could understand the component's part properly and their uses.

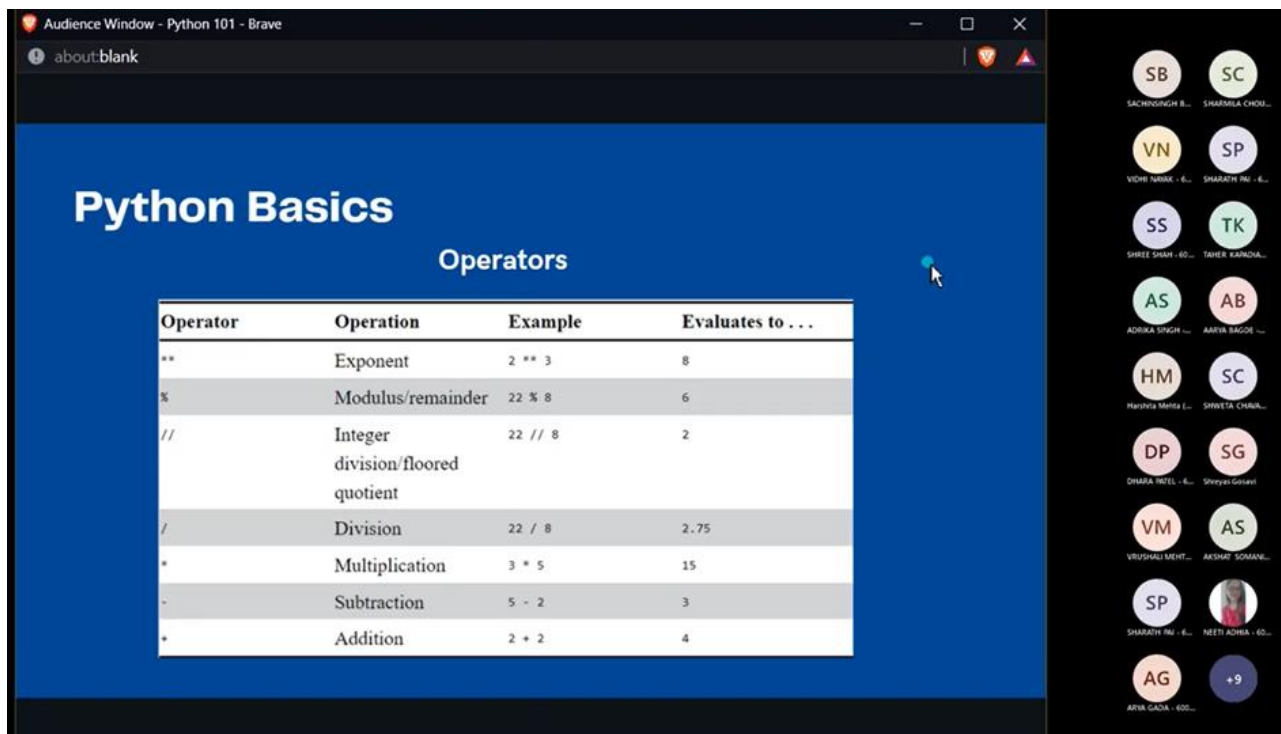


These session was filled with interactive doubt solving sessions where students asked all their doubts regarding their components.

Finally moving onto Week 5 of the workshop, this was the offline workshop held at DJSCE's EXTC department. Herein, our mentor Satvik Deshmukh explained the basic concepts of soldering components and solved doubts pertaining to the telegram bot the students had coded further on. He then went on to explain APIs and their uses, finishing the project successfully with the students asking various doubts about how they could apply their learning to further projects and applications both software and hardware based.

The workshop then concluded with the Vice-Chairperson of IETE-SF, Adrika Singh giving her concluding remarks to everyone present offline as well as online for attending the five weeklong workshop and thanking the mentors for their gracious presence throughout the term.

Photographs of the Event:





```

14 # cv2.imread('pikachu.png', cv2.IMREAD_GRAYSCALE)
15 # cv2.imshow('pikachu', pikachu)
16 pikachu = cv2.imread("D:/Codes/Project/Seminars/python-openCV/pikachu-photo-cake-2.png")
17 # cv2.imshow('pikachu', pikachu)
18 # cv2.waitKey(0)
19 # cv2.destroyAllWindows()
20 # cv2.imshow('pikachu', pikachu)
21 # cv2.waitKey(0)
22 cv2.rectangle(pikachu, (300, 300), (200, 200), (0, 0, 0), 1)
23 cv2.imshow("white_image", pikachu)
24 cv2.waitKey(0)
  
```

```

(tf-gpu-1.13) D:\Codes\Project\Seminars\python-openCV> Anaconda3\envs\tf-gpu-1.13\python.exe d:/Codes/Project/Seminars/python-openCV/test.py
(tf-gpu-1.13) D:\Codes\Project\Seminars\python-openCV> Anaconda3\envs\tf-gpu-1.13\python.exe d:/Codes/Project/Seminars/python-openCV/test.py
[[[255 255 255]
 [255 255 255]
 [255 255 255]
 ...
]]]
  
```

Numpy

Multi-Dimensional Array

channel, width, height

```

54 while True:
55     ret, frame = video.read()
56     # print(ret)
57     if ret == False:
58         break
59     cv2.imshow("video", frame)
60     # if cv2.waitKey(1) == ord('q'):
61     #     break
  
```

```

(tf-gpu-1.13) D:\Codes\Project\Seminars\python-openCV> Anaconda3\envs\tf-gpu-1.13\python.exe d:/Codes/Project/Seminars/python-openCV/test.py
Traceback (most recent call last):
  File "d:/Codes/Project/Seminars/python-openCV/test.py", line 54, in <module>
    ret, frame = video.read()
KeyboardInterrupt
^C
(tf-gpu-1.13) D:\Codes\Project\Seminars\python-openCV> Anaconda3\envs\tf-gpu-1.13\python.exe d:/Codes/Project/Seminars/python-openCV/test.py
  
```



rain
stor?
training
face
ot a face

Input → Black Box → Output

images boxes

Participant avatars: PZ, AS, SS, AA, HM, GG, SC, SB, TK, AS, SS, AA, SC, SB, GG, SB

Deep neural network

Input layer → Multiple hidden layers → Output layer

Participant avatars: TK, AS, SS, AA, SC, SB, GG, SB

video.py - python-openCV - Visual Studio Code

```
video.py ~
45
46
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61
62
63
64
```

```
# grab the frame dimensions and convert it to a blob
(h, w) = frame.shape[:2]
blob = cv2.dnn.blobFromImage(cv2.resize(frame, (300, 300)), 1.0,
                             (300, 300), (104.0, 177.0, 123.0))

print(blob)

# pass the blob through the network and obtain the detections and
# predictions
net.setInput(blob)

detections = net.forward()
# [[confidence, x, y, w, h], [confidence, x, y, w, h], ...]
# detections.shape = (1, num_detections)

# loop over the detections
for i in range(0, detections.shape[2]):
    # extract the confidence (i.e., probability) associated with the
    # prediction
```

Participant avatars: TK, AS, SS, AA, SC, SB, GG, SB



The screenshot shows a Telegram chat window on the left with messages from 'svkms' and 'svkms_bot'. The main window displays a Python script named 'telegram_simpleMessage.py' with the following code:

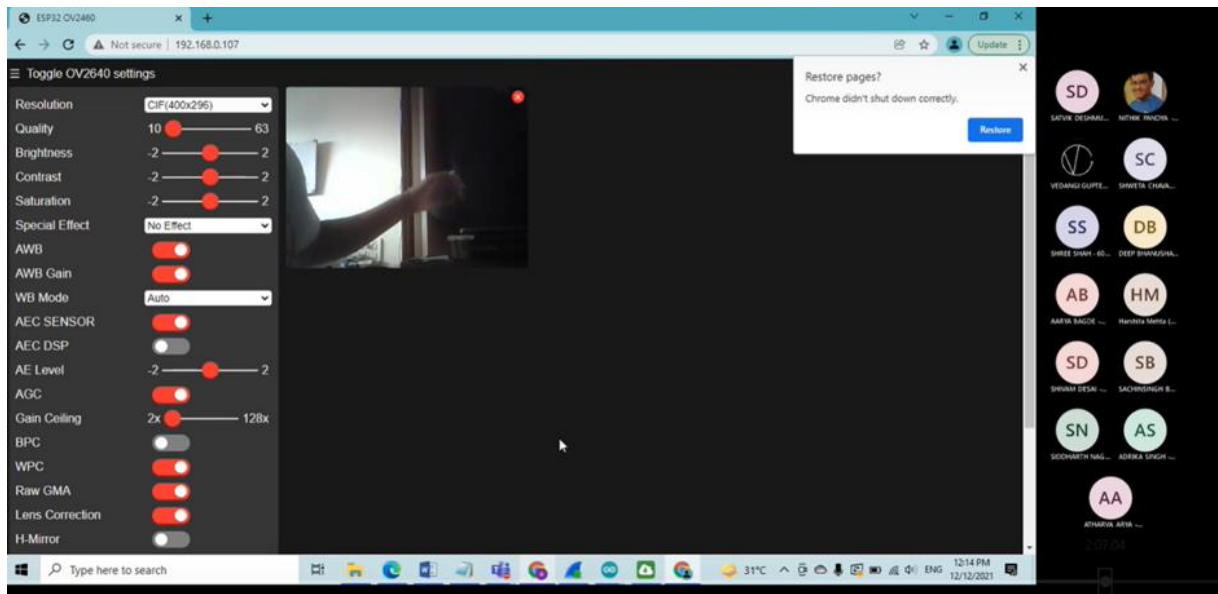
```
1 from telegram.ext import Command
2 import logging
3 from telegram.ext import Updater
4 import telegram
5
6
7 bot = telegram.Bot(token='2022203625:AAHR-k13FXDw8tDKIO
8
9
10
11 bot.send_message(chat_id=-1829778200, text="!!")
12
13
14 # updater = Updater(
15 #     token='2022203625:AAHR-k13FXDw8tDKIO2CZF-e0XC5Dj3
16 # )
17 # dispatcher = updater.dispatcher
18
19 # logging.basicConfig(format='%(asctime)s - %(name)s -
20 #     %(levelname)s', level=logging.INFO)
```

The screenshot shows a photo of an ESP32-CAM module connected to an FT232RL module. The connections are as follows:

- ESP32-CAM GND to FT232RL GND
- ESP32-CAM VCC to FT232RL VCC
- ESP32-CAM TX to FT232RL RX
- ESP32-CAM RX to FT232RL TX

The screenshot shows the Windows Device Manager window. The 'LAPTOP-UGRQREIVZ' section is expanded, showing the following hardware devices:

- Audio inputs and outputs
- Batteries
- Bluetooth
- Cameras
- Computer
- Disk drives
- Display adapters
- Firmware
- Human Interface Devices
 - LAN HD Class Filter Driver
 - UDC HD Device
 - WiiJoy Device
- IDE ATA/ATAPI controllers
- Keyboards
- Mouse and other pointing devices
- Monitors
- Network adapters
- Print queues
- Processors
- Security devices
- Software components
- Software devices
- Sound, video and game controllers
- Storage controllers
- System devices



Outcomes:

- The students understood how to use python using a Jupyter notebook.
- The students are well versed with using Python libraries such as OpenCV and Numpy
- They understood how to make bots in Telegram using python and incorporating ESP32 cam into them.
- Practical techniques such as soldering and connections for the purpose of making a working security camera were also understood.



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SEMINAR ON TECHNICAL PAPER WRITING

Speaker: Prof. Aarti Ambekar and Prof. Venkata Chavali

Association of the Speaker: Assistant Professors at DJSCE.

Date of the event: 5th March, 2021

Participants: 150 Second and Third year Students.

Objectives of the activity:

- For participants to learn the basic format of the technical paper along with the Dos and Don'ts on which content to use for writing the technical paper.
- To learn the techniques to make the technical paper formal and attractive.
- To understand the different stages through which the technical paper goes through.

Content:

“Technical writing is a continuous process of learning, carefully gathering, sifting, organizing, and assessing, all while trying to craft something that makes sense for a user.” --Krista Van Laan

With this quote in mind, IETE-SF, the student chapter of the Electronics and Telecommunications department organised a very successful seminar on a guide for writing a technical paper. The workshop was taken by Prof. Aarti Ambekar and Prof. Venkata Chavali Assistance Professors at Dwarkadas J Sanghvi College of Engineering, with a huge bunch of experience of dealing with Technical papers.

The Seminar began with the events team of IETE-SF introducing the esteemed speaker and both the professors giving the attendees a brief synopsis of what they was going to cover. We then moved onto the skeleton and basic format of the technical paper, with prof. Venkata explaining the important role of a proper technical writing when things come onto presentation. Further the students learnt about the different types of papers i.e. Conference, Journal, Letter. Depending upon type of conference or Journal – two column, single column, line spacing, font size.

The speaker then continues to explain why we need technical paper and explained the important aspects of filling content in the technical paper and making it formal and gave some important tips on how to pick and fill proper content in the technical paper. Then moving onto Conference paper firstly introduced the students with the types of articles which are research Article and review article. Conference paper writing mainly depends on Selection of the conference and the domain of the conference.

We then moved onto the most important topic i.e. contents of the paper which includes Title, Affiliation, Abstract, Keyword, Introduction (narrating a story), Main content-Figures and tables; Conclusion and lastly the References. Plagiarism is one of the most important thing which affect



the selection of the technical paper. Lesser the percentage of plagiarism more are the chances of our technical paper to get selected.

Further, the speakers introduced the students with the styling of the technical paper which included the font size, font color, font Style, font spacing and the presentation. There are some things which are not recommended or highly recommended while writing the technical paper. Some of them are:- Do not use Wikipedia or Google images or content which leads increase in percentage of plagiarism, Do not use abbreviations unless specified to do so, Do not make use of unnecessary information. Always use Groups of paragraphs, Use proper figures and flowcharts when required and many more.

Ending the Seminar, Prof. Aarti Ambekar and Prof. Venkata Chavali was thanked by the IETE-SF committee members for gracing the students with their presence and taking out their valuable time. The Seminar was very insightful and helpful for the students. With a short doubt session asked by the students the seminar came to a very successful end.

Photographs of the event:







Outcomes:

- Students and attendees became more aware of technical paper writing and its required format and language
- Students learned the importance of using proper content in the technical paper writing, along with learning about how and where to publish their papers effectively



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Workshop on MATLAB Programming by Dr. Venkataramanan V

Speaker: Dr. Venkataramanan V

Association of the Speaker: Professor, DJSCE Mumbai

Date of the event: 24th March, 2022

No. of Participants: 40 SE and TE students

Contents:

MATLAB (MATrix LABoratory) is a simple programming language with its own extensive library of mathematical and graphical subroutines. MATLAB is the world's most successful piece of numerical analysis software. Cleve Moler, founder of MATLAB in his interview outlined that he created MATLAB for educational purposes from a freely distributed package.

MATLAB combines a desktop environment tuned for iterative analysis and design processes with a programming language that expresses matrix and array mathematics directly. It includes the Live Editor for creating scripts that combine code, output, and formatted text in an executable notebook. It is one of the most versatile platforms which is useful in Data Analysis, Graphics, Parallel Computing, App Building and Web Development. It is widely used in academia as well as in industry.

Therefore, to make students aware about the MATLAB Programming Software, IETE-SF Conducted a Session "Workshop on MATLAB Programming". It was a one day event. The aim for the event was to give a general introduction to MATLAB. The Session took place on 24th March. The Session was very informative and interactive for the attendees. The Session started with good enthusiasm among the attendees to gain a good hold for MATLAB Platform under the guidance of Dr. V. Venkataramanan. Firstly, the Professor introduced himself. The speaker then proceeded to show us a detailed slide of MATLAB Programming.

Whole session was broken into ten parts: Brief Introduction to MATLAB GUI, Interactive Commands in MATLAB, Introduction to Operators, Introduction to Arrays & Functions, a Fun Gaming Session, Audio Processing, Introduction to Python Basics, Fun Animation, Introduction to Microcontroller & Microcomputer, Introduction to Arduino & Raspberry-pi and so on.

While giving Brief Introduction to MATLAB GUI, the Professor explained how to start MATLAB and explained all the components on the Workspace Window of the software. He also explained applications of these components to make the use of software more fluent.

Next on the agenda was Interactive Commands in MATLAB. Interactive Commands includes multifarious commands like Commands for managing sessions, Commands for working with the system, Commands for Input/Output, Plotting Commands and so on. To make the workshop more interactive, the Professor then introduced Funny Commands like 'Why' to attendees, which throws



Funny Jokes on running the command.

Operator was the next, this was explained with the help of basic examples. For example, Arithmetic Operators, Relational Operators, Logical Operators, etc. Students also tried these examples which helped them to learn Operators. Professor also explained how to write the Matrix. These Matrices included Row, Column & Square Matrices.

Professor explained various Data-Types available in MATLAB. To make the workshop more lively he conducted a small Puzzle Game and announced a Prize money for the winner. The group who solved the puzzle first became the winner and collected the prize.

Then, the Professor briefly illustrated Arrays and various functions available on software. And Lastly while concluding his session he illustrated Audio Processing with the help of code which plays 'Sa-Re-Ga-Ma-Pa' on running.

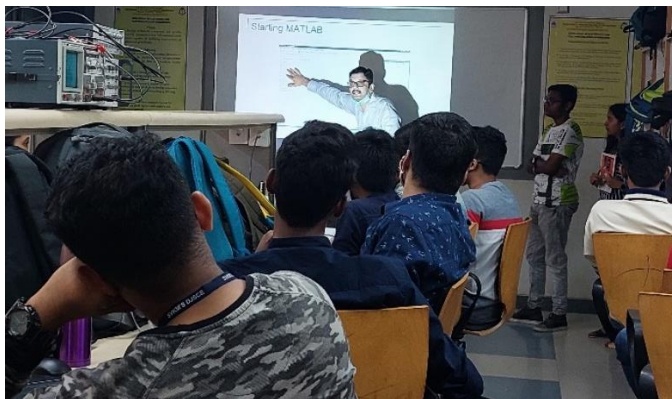
After a complete Introduction to MATLAB Programming, the event was continued by Ms. Adrika Singh and Mr. Durvang Parab in which Ms. Adrika firstly explained how to install Python and further she gave a brief introduction regarding the fundamentals of Python. She also explained Data Structures & Data Types available in Python. Then, she explained Mutable and immutable classification of objects i.e. if value can change, the object is called mutable, while if the value cannot change, the object is called immutable. She concluded her session with a fun animation.

In his session, Durvang gave a brief introduction to Microcontrollers and Microcomputers. He also explained the difference between each one of them. He then gave introduction to Microcontroller Arduino Uno Board and Microcomputer Raspberry-pi. After introduction to fundamentals, he demonstrated Arduino-LED interfacing using python in which the LED was blinking with a rest time of 3 seconds. Lastly, he concluded the event by illustrating Raspberry-pi and Arduino Integration with the help of python.

IETE-SF then thanked Dr. Venkatramanan for his valuable time and contribution and thus ended the workshop.



Photographs of the Event:





Shri Vile Parle Kelavani Mandal's

DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING

(Autonomous College Affiliated to the University of Mumbai)

NAAC Accredited with "A" Grade (CGPA : 3.18)



Outcomes:

- The students understood the need for MATLAB and how it works
- They further understood how MATLAB works, its Workspace window and its GUI.. Thus gaining knowledge of a versatile software
- The speaker further discussed operators, datatypes, arrays and functions available on software
- The participants also understood Audio-Processing and MATLAB's integration with Python



Industrial Visit to GMRT

Date: 1st April, 2022

No. of Participants: 70 TE students

Objective of the activity:

- To enlighten the students about the functioning of GMRT.
- To impart wisdom about radio astronomy and receiver technology.
- To expand the knowledge of students in the field of telecommunication.

Contents:

As part of Radiating systems course in semester VI for third-year engineering students, an industrial visit was conducted to GMRT Pune, Khodad district on 1 April 2022. The trip was accompanied by esteemed faculties, Dr. Amit A Deshmukh (Head of EXTC Department),

Dr. Sunil Karamchandani, Prof. Venkata A P C and Prof. Revathi A S alongside students.

GMRT(Giant Metrewave Radio Telescope) is used by astronomers all over the world to observe different astronomical objects such as HII regions, galaxies, pulsars, supernovae, and Sun and solar winds. One of the aims of the telescope during its development was to search for the highly redshifted 21-cm line radiation from primordial neutral hydrogen clouds to determine the epoch of galaxy formation in the universe. In August 2018, the most distant galaxy ever known, located at a distance of 12 billion light-years, was discovered by GMRT. In February 2020, it helped in the observation of the biggest explosion in the history of the universe, the Ophiuchus Supercluster explosion

During this industrial visit, we studied the Parabolic antenna used for radio astronomy. Radio astronomy is the field of science in which the radio waves emitted by objects, and celestial bodies in space are captured by the receiver which is used to determine the object in detail which can be used for space exploration, finding resources on planets, stars, etc. Clouds and weather conditions do not affect the reception of radio waves. However, lightning strikes can interfere with the electric field of the signal. The only requirement is that the source should have an RF signature of its own for efficient study of the object.

Structure: It is a parabolic dish with an outer diameter of 45m. To make it lightweight, meshes of steel are used. The outer mesh has dimensions of 15m x15m and the inner mesh has dimensions of 5m x 5m. The azimuth angle of this antenna is $\pm 270^\circ$ and the elevation (solid angle) is $18^\circ - 90^\circ$. The antenna is equipped with a boat-shaped structure between the parabolic dish and servo motors to balance the Centre of Mass of the parabolic dish. A BLDC(Brushless DC) servo motor is used for the rotation of the antenna in the direction of the source. The antenna is painted every five years to prevent corrosion.



The resolution of an antenna is directly proportional to the size of the antenna. But practically designing antennas with huge sizes is not a viable solution. Therefore, 30 small parabolic antennas are spread over an area of a 25km radius. These small antennas form an array feed network. All of these antennas receive signals from one source at a time.

Receiving signals: Fiber optic cables are used to feed the electrical signals. It can be used in single or multimode. For antenna remoting applications, a single mode is used as it supports longer link distance and faster transmission of signals since a single mode is used. Signal loss is very low as the core used has a diameter of 1310 nm. In addition, walls are built around the antenna to prevent the ground propagation of signals.

The feeds presently available are Band-5 (1000-1460 MHz), Band-4 (550-850 MHz), Band-3 (250-500 MHz), and Band-2 (125-250 MHz) feed. The reflecting surface is formed by a wire mesh and the efficiency of the antennas varies from about 60% to about 40%, from the lowest to the highest frequency. Signals from two orthogonal polarisations are brought to the control room from each antenna, over optical fiber. The native polarisations for all receiver systems are circular, except for the Band-5 system, which delivers linear polarisations.

Working: When receiving signals, these antennas have to be synchronized in time with the source for the sound reception of signals. Hence, the antenna is rotated according to the source. Once the reception of the signal is completed, the antenna calibrates itself with the reference source every 20 mins. By default, the antenna completes one rotation every 30 mins. For perfect signal reception, counter-rotation is provided by the servo motors. After receiving the signals, correlation is performed to remove noise.

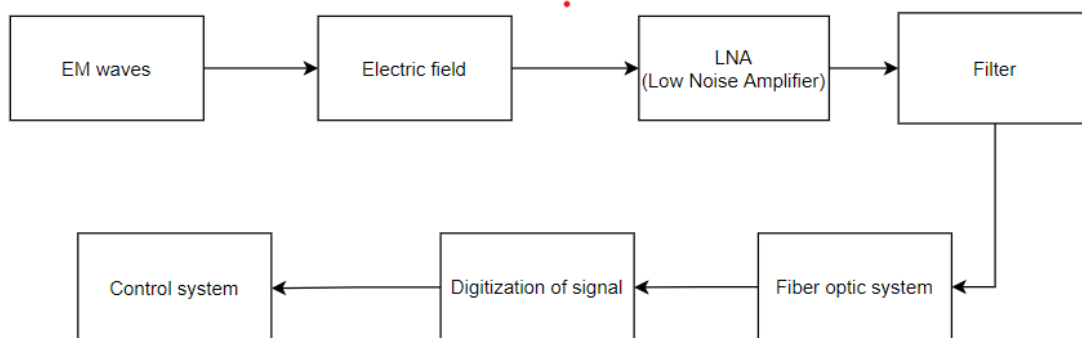


Fig. 1. Block diagram of signal reception and processing by an antenna

Frequency of operation and gain:



This antenna operates in the frequency range of 100-1500 MHz. The maximum gain of this antenna is 40dB. Gain is controlled by using the parabolic dish's inner and outer meshes.

GMRT has played a crucial role in the exploration of space. In the past, this telescope was used to measure the atomic hydrogen content of distant galaxies. It is always at the forefront to collect data to discover the secrets of space.

Photographs of the Industrial Visit:





Shri Vile Parle Kelavani Mandal's

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Outcome:

- Students acquired information about the working and telemetry of GMRT
- They witnessed the antennas present at the GMRT and understood its functioning
- They learnt about new concepts related to the field of telecommunication which can be utilised in future projects



Alumni Meet

Speakers: Various distinguished alumnus from the Electronics and Telecommunications department

Date of the event: 12th of May 2022

Participants: Second Year and Third Year Students

Number of Participants: 85

Objectives of the activity:

- Providing the students an opportunity to connect with various industry experts graduated from the college itself and insights into their experiences.

Content:

The Alumni meet was conducted on 12th of May 2021, in the seminar hall hosted by the department of Electronics and Telecommunication department.

It started with DJSCE EXTTC Alumni joining from their respective workplaces/Universities through online medium while those in India were invited to the college.

Our HOD Dr.Amit Deshmukh addressed the audience followed by the alumnis sharing various experiences and a QnA session hosted by our IETE-SF team members Aayush Gandhi and Dev Ambani.

It was organised for the students to get advice and meet with alumni who had a lot of job experience in their respective industries. They discussed a variety of life and career experiences, and here are some highlights.

- After graduating in 2017, Daksh pursued his master's degree after a one-year break. He worked as a summer intern in Connecticut. Daksh is currently employed at Granger as a Data Engineer. He also advised on Data Analytics, landing internships, and the value of networking.
- Viren Contractor graduated in 2020 and is currently working as an analyst at EY Banking and Finance Centre.
- Bhoomik Pathak worked for L&T Tech Company for a year before joining Amazon as a Data Engineer. He explained how one can get to where he is by using the soft skills along with technical knowledge.
- Prathamesh graduated in 2017 and went on to complete his master's degree in musical engineering. He also shared his internship experiences at companies such as Tesla and Dolby.
- Pratik Sanket earned his MBA in 2022 and works as a production engineer for IDFC Bank.
- Pooja graduated in 2019 and worked for the IETE committee. She learned a lot more by



- doing extra circular activities. She advised the students not to underestimate their abilities.
- Megh Doshi completed his PhD in control systems after graduating in 2019. He advised focusing on skill development.
 - Keval graduated in 2017, completed his master's degree in Georgia Tech, and is currently employed at Intel as an advanced protocol designer. He advised students not to have a tough mentality in life.
 - Mohit Shah, the marketing manager at ZEE-5 has contributed to the company's growth and shared his experiences with his marketing career.
 - Samruddhi completed an MBA in HR marketing, Spotify, and applied for exams such as the FCAT and SSB.
 - Neel Shah completed his MBA in finance at NMIMS and also shared his incredible experience with the courses he applied for.
 - Dishant Shah graduated in 2020 and gained a lot of experience by starting up directly after college. He chose entrepreneurship in his final year of engineering and also discussed his thoughts on A.I. in the future. He currently has two start-ups:
 - 1) Medical-related start-up: There are no price restrictions, and competition is minimal.
 - 2) Thermal Devices: There is currently no revenue generated.

The students benefited much from the event because it directed them in a variety of ways and supported them in making numerous decisions. The alumni's diverse experiences were great and valuable to the pupils.

Photographs of the event:





Outcomes:

- The students connected well with the alumni's who in turn had various opportunities for them. Some alumni's offered internships within their own start-ups to a few students
- Students and attendees became more aware of the various professions present and how one can go about pursuing them
- Attendees learnt about the different skills they can acquire during their college tenure to become a better more viable professional candidate
- Students are now equipped to emulate a career they find intriguing



Power BI Workshop

Speaker: Prof. Ameya Kadam

Date of the event: 19th May 2022

Participants: FE and SE students

Number of Participants: 30

Objectives of the workshop: Participants should get familiar with the basics of Power BI software which is as strong as a business analytical tool that creates useful insights and reports by collating data from unrelated sources.

Contents:

“By visualizing information, we turn it into a landscape that you can explore with your eyes. A sort of information map. And when you are lost in information, an information map is kind of useful.” – David McCandless
Microsoft Power BI is a collection of apps, software services and connectors that come together to turn unrelated data into visually impressive and interactive insights. Power BI can work with simple data sources like Microsoft Excel and complicated ones like cloud-based or on-premises hybrid Data warehouses. Power BI has the capabilities to easily connect to your data sources, and visualise and share and publish your findings with anyone and everyone. Power BI is simple and fast enough to connect to an Excel workbook or a local database. It can also be robust and enterprise-grade, ready for extensive modelling and real-time analytics. This means it can be used in a variety of environments from a personal report and visualisation tool to the analytics and decision engine behind group projects, divisions, or entire corporations. As Power BI is a Microsoft product and has built-in connections to Excel, many functions will be familiar to an Excel user.

Therefore to make students aware of data visualisation and analysis; IETE-SF Conducted a Workshop on "Power BI". The Session took place on 19th May 2022 and was a roaring success with over 120 participants attending the event. The Session started with good enthusiasm among the attendees to gain a good hold on Data Analytics under the guidance of the Speaker.

Firstly, the speaker for the day, Prof. Ameya Kadam, introduced himself sharing his experience in the field of Data Analytics and Visualization. The speaker had instructed the participants to download POWER BI beforehand by sharing a video for the same. He yet quickly showed everyone how to download the POWER BI tool and connect it to Microsoft Excel.

With everyone having POWER BI Tool-ready on their laptops, the speaker started the session by discussing various tools for Data Visualization and modelling and why POWER BI is the most used application.

The speaker then shared with the students, the sample data to analyse. Data on the Superstore was shared with the students. The students were expected to work on the same throughout the workshop. After going through the data, the speaker then taught the attendees to load the data on



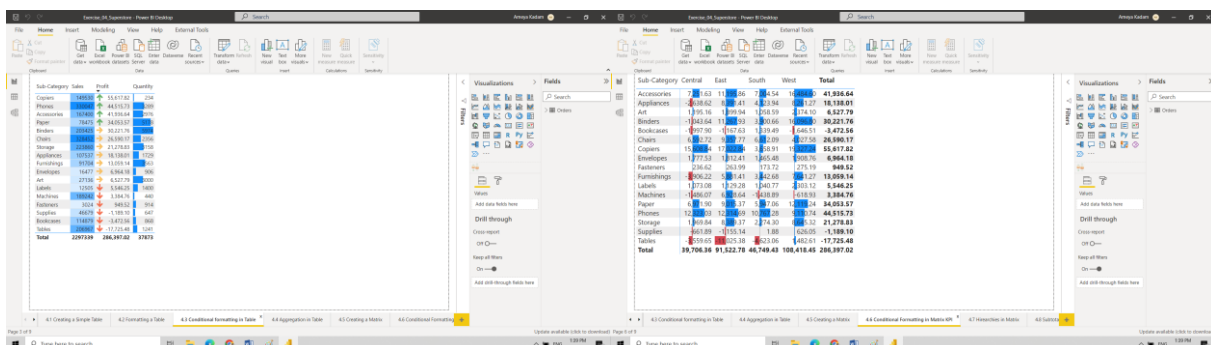
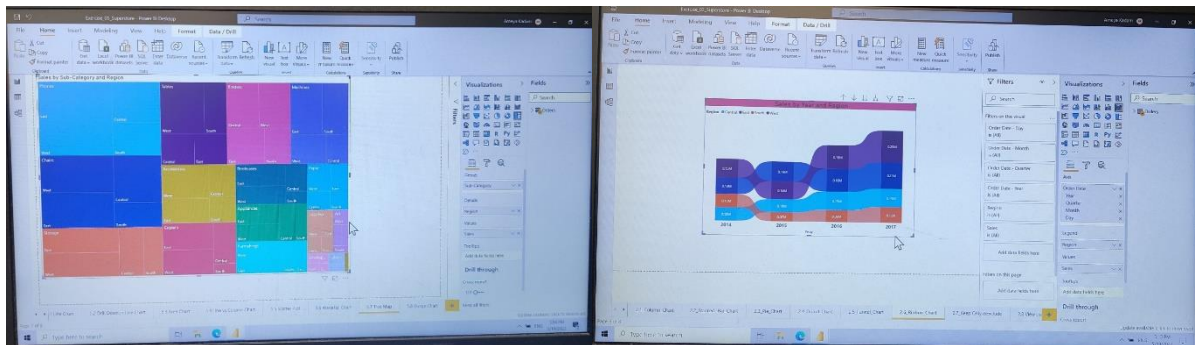
the Power BI applications. Students followed the instructions and were on par with the Professor.

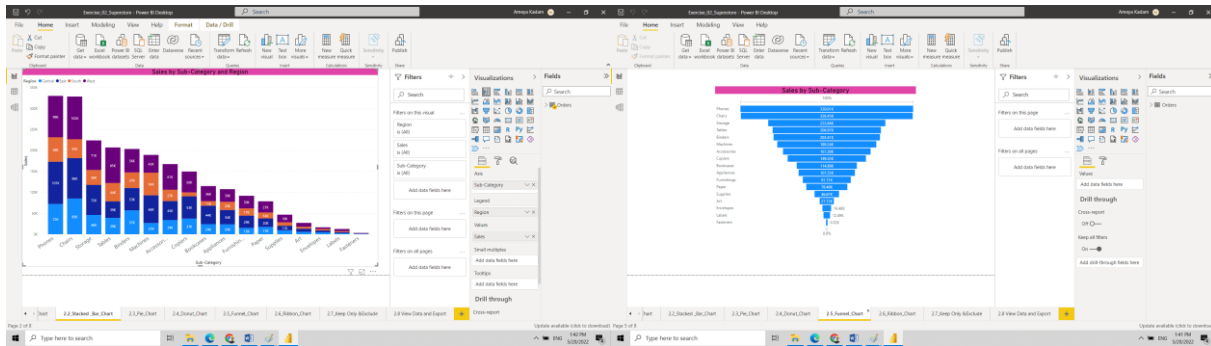
The next step was to analyze the sample given. The speaker guided the students to analyze the data given concerning different parameters and charts. The students were then engaged in transforming the data to create visuals and reports. The session also focused on making the students learn the different features of data visualisations by introducing the different types of charts viz, Column Chart, Stacked Column Chart, Pie Chart, Ribbon chart, Sankey Chart, ScrollerBox plot, Map Filled Map Gauge, Meter Drill down Line Chart, Funnel Chart, Donut Chart, etc.

Once the students were familiar with the charts and visualisation parameters, the speaker explained to them the formatting of the charts for better visualisation and modelling. Finally, Professor also taught them how to share the created visuals or reports using different Power BI services.

The students were now enhanced with the skill of Data Visualisation and Modelling by using Power BI. The speaker concluded the session by briefing them on the summary of the workshop and finally taking up the questions and answers round. The session came to an end with the IETE team presenting Prof. Ameya Kadam with a Certificate of Appreciation.

Photographs of the Event:





Outcomes:

At the end of the workshop participants were able to

- Extract data and transform data from various data sources, create visuals or reports on Power BI
- Along with this they were able to share the visuals built using Power BI services.