REVISTA

MAGAZINE MAY 2021

DEPARTMENT OF INFORMATION TECHNOLOGY

HINDUSTHAN
College of Engineering and Technology
Coimbatore

Shri.T.S.R.khannaiyann
Chairman
Hindusthan Educational and Charitable Trust
Coimbatore.

MESSAGE

REVISTA'20 is an innovative piece, which showcases the hard work put in by the editorial board. I appreciate the efforts of the editorial team who have done an excellent job in compiling REVISTA'20 activities over the year and disseminate them through this magazine. I wish them all success for their future endeavor.

THIRU T.S.R.KHANNAIYAN
(CHAIRMAN)

Smt.Sarasuwathi Khannaiyann

Secretary

Hindusthan Educational and Charitable Trust

Coimbatore - 641032

MESSAGE

"Education is simply the soul of the society as it's passes from one generation to another"

               -G.K.Chesterson

      Engineers play the most vital and important role in nation building. They create new inventions using best engineered technologies to make human life more comfortable, secure and productive. We have excellent potential to grow in diversified areas and excel in Engineering and Management fields. We need enormous number of engineers and managers to write next story of success.

      At the outset I send my greetings to the Editorial Board of REVISTA' 20, for working on a Magazine best in all aspects. I believe this magazine will proc ide us the benchmark for continued improvement in overall development of the College.

MRS.SARASUWATHI KHANNAIYANN

                  (SECRETARY)

Department of Information Technology

Mrs.Priya Sathish Prabhu
Joint Secretary
Hindusthan Educational and Charitable Trust
Coimbatore – 641032

MESSAGE

"Education is the most powerful weapon which you can use to change the world"

-Nelson Mandela.

REVISTA'20 is an excellent piece of publication that demonstrates the literary, art and imaginative skills of our students. It is always inspiring to read through the pages of the magazine and see such talented academics pushing the boundaries of discovery. Congratulations to the entire team!

MRS.PRIYA SATEESH PRABU
(JOINT SECRETARY)

Department of Information Technology

Dr.T.Kannadasan
Principal
Hindussthan college of Engineering and Technology
Coimbatore – 641032

MESSAGE

It gives me immense pleasure to pen a few words as prologue to our in-house magazine 'REVISTA 20' exclusively meant for churning out the latent writing talent which bears immense potentiality of sharpening your communication skill as part of your overall personality development. I congratulate all the contributors and the editorial board for bringing out such a beautiful magazine.

I am confident that 'REVISTA 20' would turn out to be a real trend-setter in surfacing and kindling in young ITians.

IT is Imminent, IT is Real

DR.T.KANNADASAN
(PRINCIPAL)

Dr.N.Rajkumar
Professor & Head
Department of Information Technology
Hindusthan College of Engineering and Technology
Coimbatore – 641032

MESSAGE

       I am very much delighted and happy that our department is releasing the 'REVISTA 20'. It ignites fresh enthusiasm of the creative skills over the students of our department and fulfills their expectations. I would like to thank everyone for their active support to release this magazine. I extend my warm greeting to all the participants and organizers of the 'REVISTA 20' and your support will encourage us to release the issue every year.

Wishing you all the best…!

DR.N.RAJKUMAR
PROFESSOR & HEAD

Department of Information Technology

Mrs.P.Revathi
Assistant Professor
Department of Information Technology
Hindusthan College of Engineering and Technology
Coimbatore – 641032

MESSAGE

It gives me immense pleasure that our department is releasing the REVISTA'20. It grabs out the creative skills over the students of our department. Guided by our pillars of support, our faculty members, we got the magazine done with all its formalities and informalities. I have to thank all our student editors here for their continuous support throughout this magazine's creation. It's been a journey, a journey that taught us many lessons and provided us with quite a bit of entertainment as well.

MRS.P.REVATHI
AP/IT

VISION OF THE DEPARTMENT

- To develop IT Professionals of the best caliber with Entrepreneurship Zeal.

MISSION OF DEPARTMENT

- To establish a best Learning Environment that helps the Students to face the Challenges of IT field.
- To enable the Students to develop Skills for solving Technical Problems and also endorse Collaborative and Multidisciplinary activities.
- To induce Entrepreneurial mindset amongst Students and develop the necessary Skills to meet the Entrepreneurial needs of the Society.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- **PEO1:** Graduates of the program will be proficient in identifying, formulating and solving complex problems by applying their knowledge of mathematics, science and information technology principles.
- **PEO2:** Graduates of the program will be capable of analyzing, designing, implementing and managing software projects through continuous learning and use modern tools to meet real world constraints.
- **PEO3:** Graduates of the program exhibits professionalism with ethical attitude, excellent communication and term spirit to Satisfy society needs.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- **PSO1:** Able to design and develop software solutions by employing appropriate problem solving strategies, including Logically thinking, Create a user interface, Write code to connect a front end user interface with a backend database using a contemporary object-oriented language.
- **PSO2:** Ability to design and develop mobile applications and Web based applications with testing skills which consequently leads to employability and entrepreneurship skills.

TECHNICAL PROGRAMMES

Department of Information Technology

1. **Four Days Webinar Series on "Research Challenges and Applications in Data Science"**

   Four Days Webinar Series on "Research Challenges and Applications in Data Science" was conducted on 24th - 28th August 2020. It was inaugurated by Dr.N.Rajkumar - Head of the Department of Information Technology. The sessions were handled by Dr. J.Nirmaladevi, Prof. & Head, Dept. of IT Excel College of Engineering , Dr.R.Rajesh Sharma AP/Dept. of , Adama Science & Technology University Ethiopia, Dr.S.Poornachandra, Recipient, IETE, R.S.Khandpur Award and Dr. J. V. Bibal Benifa, Assistant Professor, IIIT Kottayam, Dr.M.Chengathir selvi, AP/Dept. of IT, Kamaraj College of Engineering and Technology. The main objective of this Webinar is to process of building, cleaning, and structuring datasets to analyze and extract meaning. These processes share many similarities and are both valuable in the workplace. More than 85 students were participated and benefited.
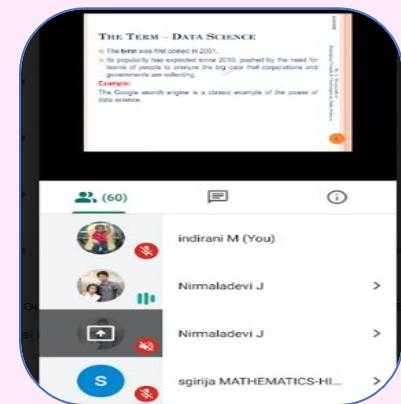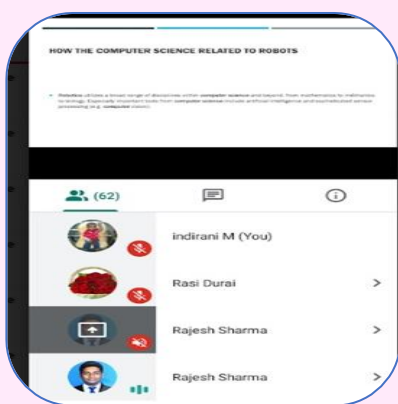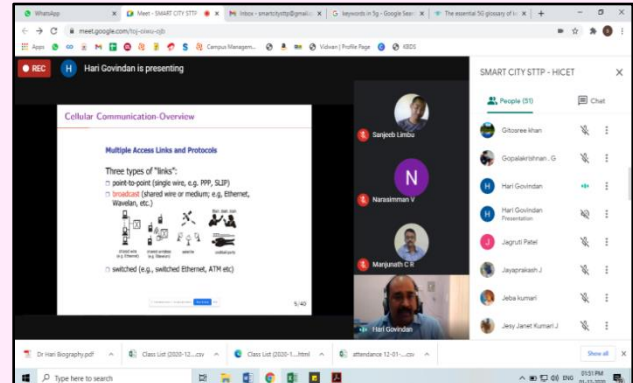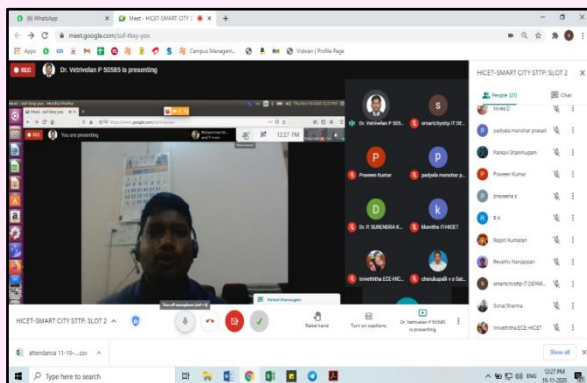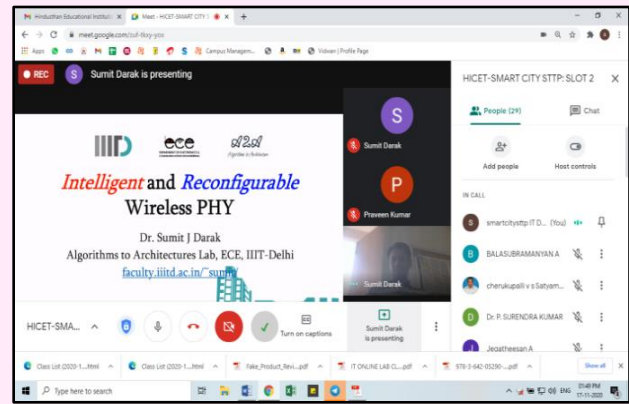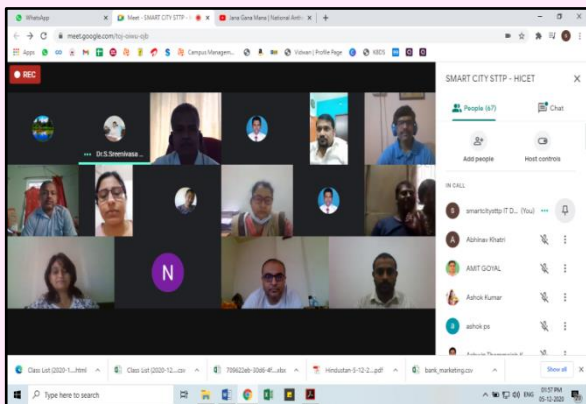

2. **AICTE Sponsored One Week Short Term Training Programme on "Potential and Challenges for Integrating 5G Networks and IOT Applications in Smart City Environment"**

   AICTE Sponsored One Week Short Term Training Programme On "Potential and Challenges for Integrating 5G Networks and IOT Applications in Smart City Environment" was held on 19.10.2020 to 24.10.2020 Slot I, 16.11.20 to 210.11.20 Slot II, 30.11.20 to 05.11.20 Slot III. It was inaugurated by Dr.N.Rajkumar, Head of the Department. The main aim of AICTE Sponsored Short Term Training Program (STTP) is to conduct faculty trainings through financial assistance from AICTE to enable faculty members in the field of technical education to introspect and learn techniques that can help prepare students for active and successful participants in a knowledge society.
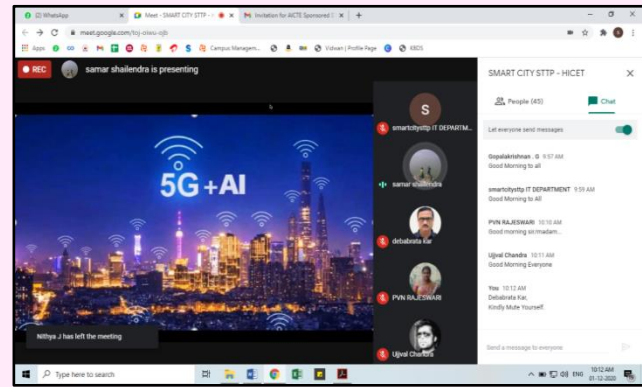
Phase I: Glimpse of Potential and Challenges for Integrating 5G Networks and IOT Applications in Smart City Environment

Phase II & III: Glimpse of Potential and Challenges for Integrating 5G Networks and IOT Applications in Smart City Environment

Department of Information Technology

3. Association Inauguration on "Open Source - RED HAT Technologies and Global Certification"

Association Inauguration on "Open Source - RED HAT Technologies and Global Certification" was conducted on 9th Nov 2020. It was inaugurated by Dr.N.Rajkumar - Head of the Department of Information Technology. The sessions were handled by Mr. Ranjit Sengupta, Director and Chief Operating Officer, Vectra Technosoft Pvt Ltd, Chennai. The main aim of this Association for students welfare and motivate to complete Global Certification courses. More than 100 students were participated in this event.

4. AICTE-ATAL Sponsored FDP on "Data Science":

AICTE-ATAL Sponsored FDP on "Data Science" was conducted on 02.11.2020 to 06.11.2020. It was inaugurated by Dr.N.Rajkumar - Head of the Department of Information Technology. The sessions were handled by Dr Gopi S, Professor, NIT, Trichy , Dr. Uday Pratap Singh, Associate Professor, Shri Mata Vaishno Devi University, Jammu and Kashmir, Dr Kumudha Raimond, Professor, Karunya University, Coimbatore, Dr Baijnath Kaushik, Associate Professor, Shri Mata Vaishno Devi University, Jammu and Kashmir, Dr Bibal Benifa J V Assistant Professor IIIT Kottayam, Kerala, Vijay Krishna Menon, AP, Comp Engg and N/W, Amrita Vishwa Vidyapeetham,Coimbatore. This FDP aims at the professional development of faculty members of instruction to accelerate knowledge of faculties in the field of data science.More than 200 faculties were participated and benefited through this FDP.
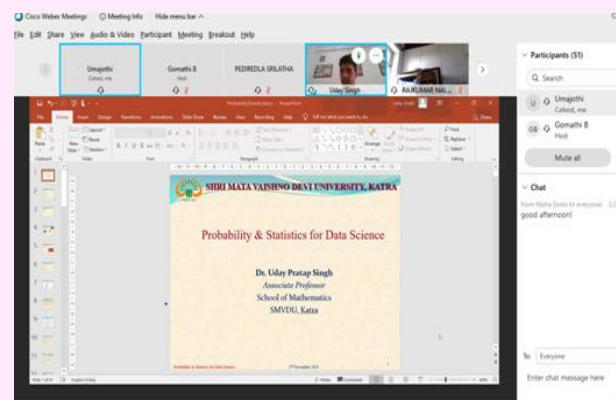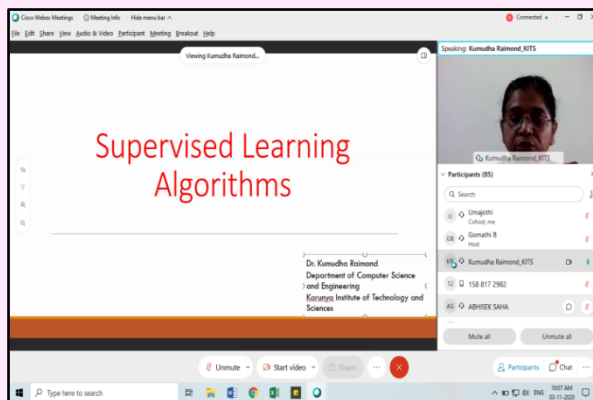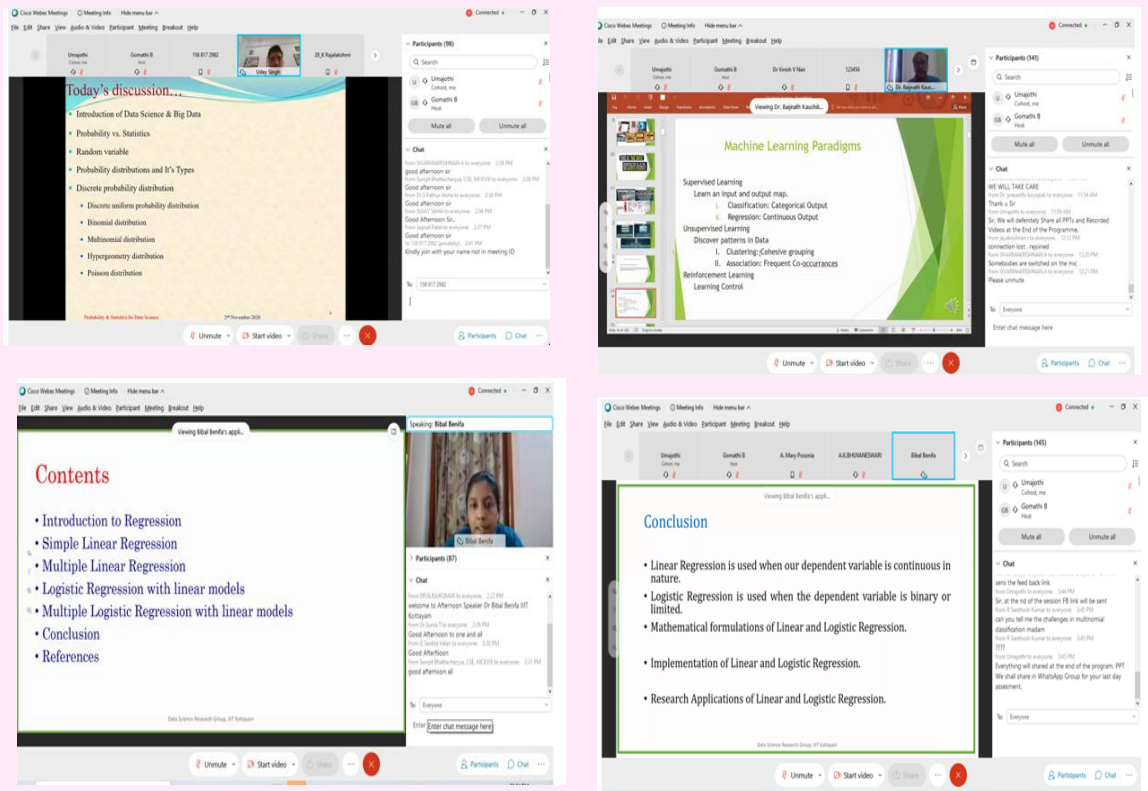
5. **Inauguration of Data Analytics Club**

   Inauguration of Data Analytics Club was organized on 12-11-2020. As a part of Inauguration Guest Lecture was delivered in the title "TechTalk of the Club on Data Analytics and its Importance in the Industry". The Inauguration and Session delivery were handled by the Resource Person Mr. K.S.Siddesh Ram Director – Human Resources & Operations, AugRay, Chennai. Through this event the stakeholders of the club gained information about the various career options for the students in the field of Data Analytics and Awareness on Data Analytics and its importance in the industry, advancement in the world of technology and IT industry. Nearly 95 Participants from various Department of HICET Participated and got benefited.

6. **One day Virtual Mode Guest Lecture on "Internet of Things and Applications"** was conducted on 30th Jan 2021. It was inaugurated by Dr.N.Rajkumar - Head of the Department of Information Technology. The sessions were handled by Dr. Ranjit Singh Sarban Singh, Senior Lecturer Computer Engineering, Faculty of Electronic and Computer Engineering Universiti Teknikal Malaysia Melaka (UTeM) Melaka, Malaysia through Google Meet. The Seminar Focused on the motivation for development of IOT based projects. Recent days IOT is one of advanced Technology around all over the world and it makes students come out with different ideas related to know about sensors applications. More than 90 students were enlightened with the knowledge of IOT and its applications.

7. **IIC driven workshop on Entrepreneurship Development phases:** One day IIC driven workshop on "Entrepreneurship Development phases" was conducted on 30th JAN 2021. It was inaugurated by Dr.N.Rajkumar-Head of the Department of Information Technology. The sessions were handled by Ms. S. Siva Raghavi, Director Startup Grind, Coimbatore. The main objective of the program is to obtain knowledge and ideas about the startup in various fields such as Aviation, Government policies and to handle the emotional situations with multiple partners. This workshop is also made for to approach various funding agencies and investors to startup the business. Around 353 students were actively participated and benefited from this program
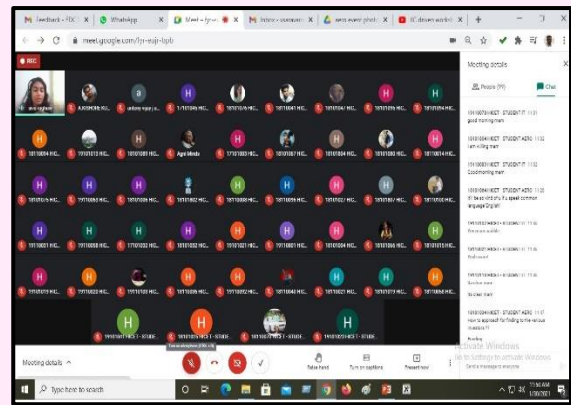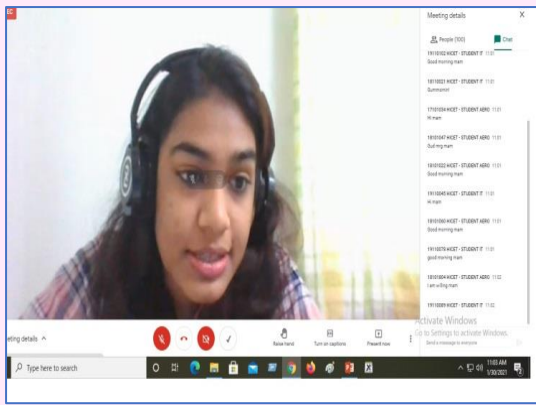
8. A Webinar on "Data Visualization"

As a Part of our Data Analytics Club of HICET organized A Webinar on "Data Visualization" on 04.02.2021. It was inaugurated by Dr.N.Rajkumar- Head of the Department of Information Technology. This session were handled by Mr.Vishnu S, Software Technical Trainer, AdroIT Technologies, Coimbatore. The main objective of this webinar to give awareness on resources and tools to help with good data visualization to the students. They were made to Understand best practices for how and when to use data visualization through this webinar. Totally 85 participants were participated from various departments and get benefited.

9. Guest Lecture on "Cyber Security and Ethical Hacking "

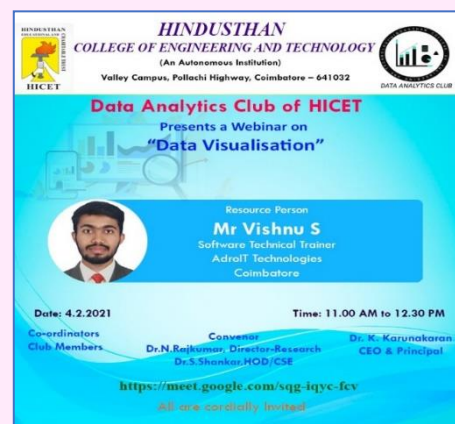Guest Lecture on "Cyber Security and Ethical Hacking" was conducted on 26th February 2021. It was inaugurated by Dr.N.Rajkumar - Head of the Department of Information Technology. The sessions were handled by Dr.MohdZaki Bin Mas'ud, Senior Lecturer Department of Computer and Communication System, Faculty of Information and Communication Technology Universiti Teknikal Malaysia Melaka. The Objective of this Guest Lecture is to enhance student knowledge among Discover software bugs that pose Cyber Security threats, explain and recreate exploits of such bugs in realizing a cyber attack on such software,and
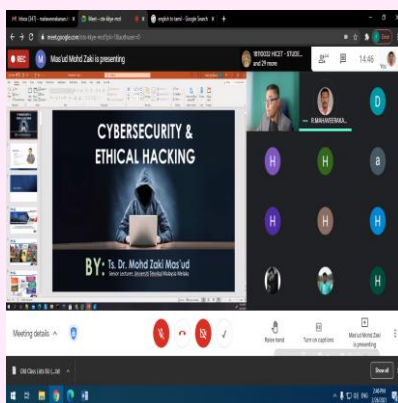
explain how to fix the bugs to mitigate such threats. More than 100 students were participated in this event.
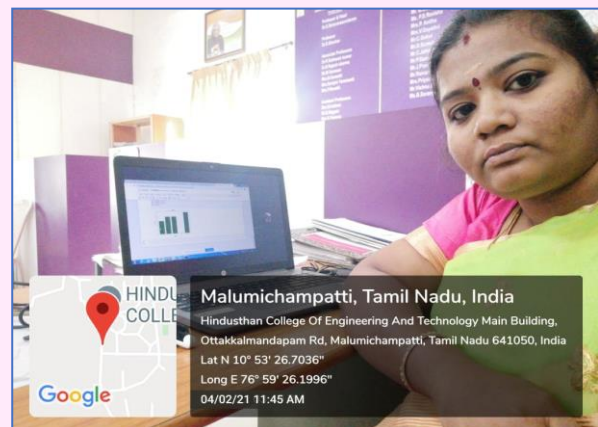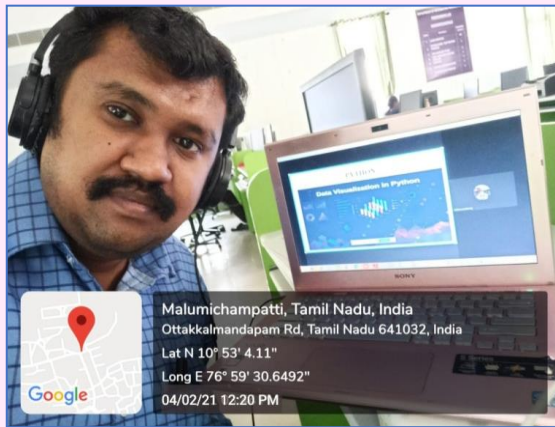
10. Webinar entitled "Adaptation of Augmented Reality and Virtual Reality to Recent Trends"

IEI Club of HICET organized A Webinar entitled "Adaptation of Augmented Reality and Virtual Reality to Recent Trends" on 27.02.2021. It was inaugurated by Dr.N.Rajkumar - Head of the Department of Information Technology. This session was delivered by the Resource Person "Mr. Patric Phinehas Raj, Associate Software Engineer at Robert Bosch Pvt Ltd., Coimbatore. Through this Webinar the Participants gained knowledge in Augmented Reality and its

Applications in various Field of Medical Science and in other Technologies. The Resource Person also narrated the significance of Virtual Reality and its recent trends in the Field of IT. Around 75 Participants were got benefited out of this IEI Sponsored Event from various Department of HICET.
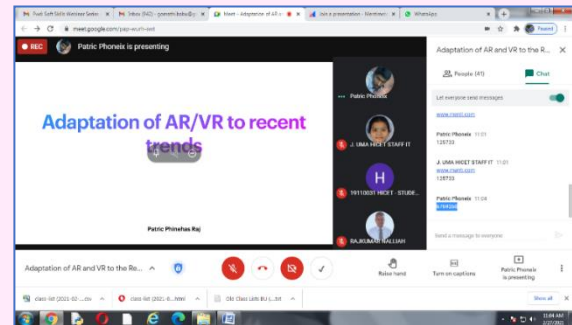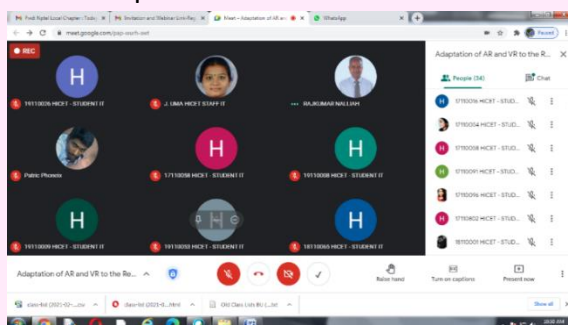
PROJECTS

AN INTERNET OF THINGS APPROACH FOR
RFID SMART TOLLGATE AUTOMATION

Submitted by,

K.BALA KOUSHIK

R.GUNAL SRIRAM

M.MOHAMMED FAIZ

G.AJAY JOHNSON

ABSTRACT

The major problem faced today is the traffic congestion. Due to the increase in the growth of vehicles, the toll booth becomes bottleneck while vehicles pass through the toll gate due to their manual operations. Since the manual operations can be slow, the automated toll collection system is very successful right now. Every vehicle is tagged with RFID tag. Since each RFID tag is unique, it represents the unique identification number for the vehicle. RFID reader can detect or sense the RFID tags and send the information to the IOT controller (Raspberry Pi). Sensed information can be looked into the database for getting the balance in the owner's prepaid account, and then the toll tax can be automatically deducted. For user interface, a mobile app will be developed with which the client can track the details of vehicle and payment logs. The purpose of this paper is to overcome the drawback of manual toll collection system.

SYSTEM ARCHITECTURE

➢ First job is to detect the arriving vehicle using IR sensors. For that purpose, it has to pass through the IR transmitter Receiver gate.

➢ Then it enables system to read RFID tag attached to the vehicle and the data is matched with the information in the database provided during registration.

➢ We assume that the vehicles are already registered and the toll gate remains closed for the unregistered vehicle or if the balance in the owner's account is low, he will be directed to pay toll manually.

➢ So this system can be used by RTO and police department to identify stolen vehicles and to block that particular vehicle. The details will be updated in the database server

➢ The status will be displayed on the LCD. It also triggers the mechanism to generate the bill and the cost information is sent to the mobile phone of the owner through GSM modem

➢ The whole system is connected to the internet and web app via server having the database of vehicles and users can use the app for monitoring. Each user will have unique vehicle number as username and password. After logging into the account, the user can see the all the related details. In case of insufficient balance, user can recharge using e-mode of the app
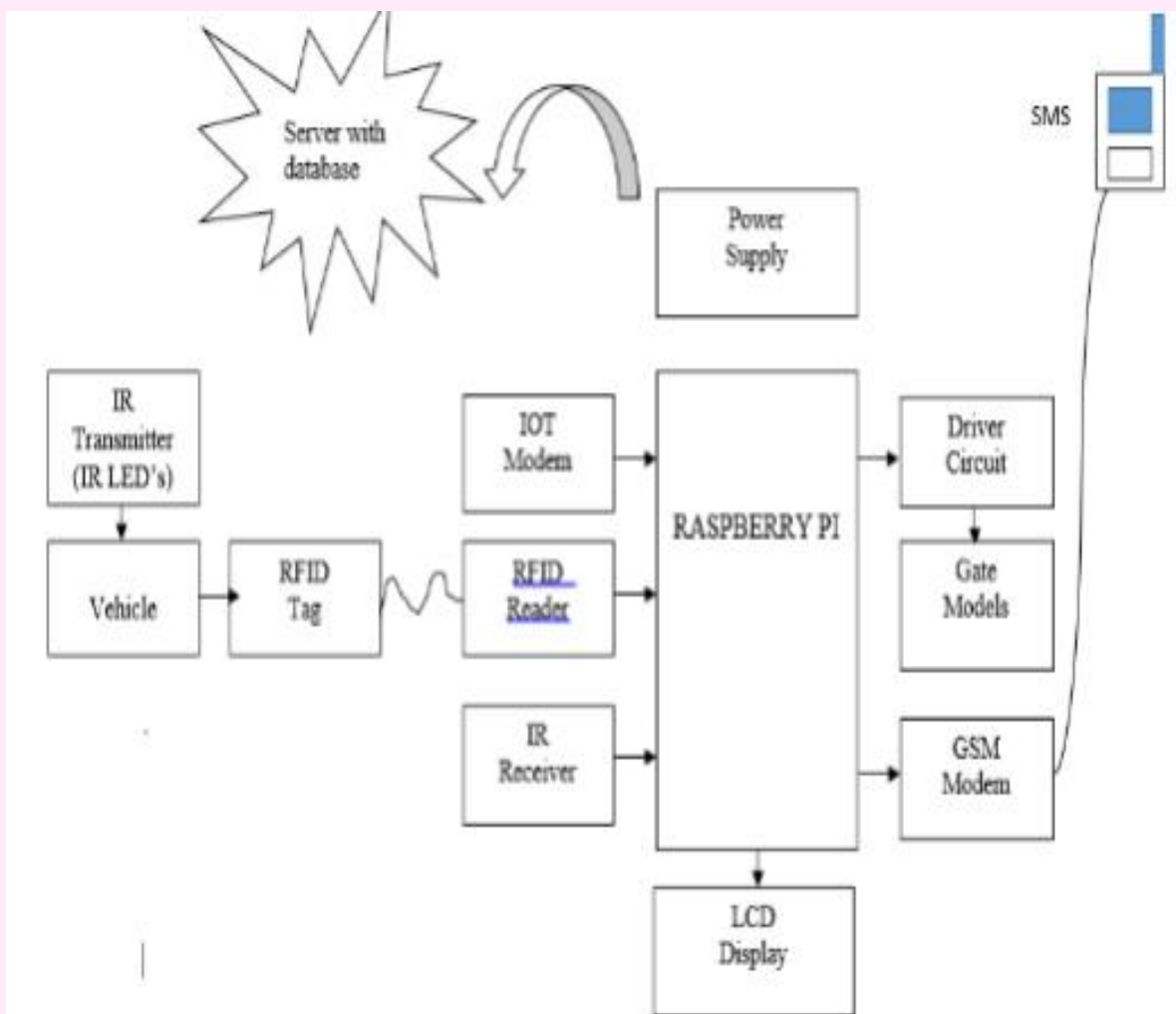
INTELLIGENT TRAFFIC MANAGEMENT SYSTEM USING

YOLO MACHINE LEARING MODEL

Submitted by,
ANANDHAKUMAR.P
ASHWIN.G
AVINASH.V
DINAKARAN.K. P

ABSTRACT

People in today's era usually have the tendency of using their own private vehicles for commutation rather than using public transit and this result in large number of private vehicles on road. It leads to traffic congestion at every roads. In such scenario one cannot restrict individual to limit the usage of their private vehicles but we can able to manage traffic flow in a way that it doesn't alleviate congestion issues. The traditional traffic management approach works efficiently only if the traffic is less, but if the density of vehicles on a particular side of road increases on one side than other side, this approach fails. Hence, we aim to redesign the traffic signal system from static switching to dynamic signal switching, which can perform instant-time signal monitoring and handling. There are many projects emerging in order to convert the current transport system of cities to 'Smart system', by introducing Intelligent Transport System. Many initiatives are taken to design a system that can perform instant monitoring of traffic signals i.e., the traffic signal switching time will depend on the count of vehicles on each side of the road instead of predefined switching time. The switching time of signal will be decided based on vehicle detection in day-to-day traffic scenarios with good accuracy. This practice can prove its effectiveness in releasing the congested traffic at an efficient and faster rate.

YOLO - Simplified Network Architecture
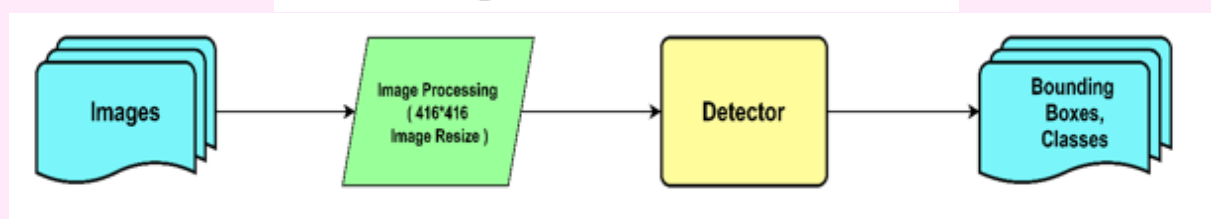
SYSTEM ARCHITECTURE

Our proposed system implements Intelligent Traffic Management System using YOLO Machine Learning Model. Applying Machine Learning model will result in a very efficient management of the traffic, since the machine learning models get better as it learns over the period after its implementation. Current work focuses on training the machine learning model and deploying it to get the traffic count for better management of the traffic. Current detection systems repurpose classifiers to perform detection. To detect an object, these systems take a classifier for that object and evaluate it at various locations and scales in a test image. Systems like deformable parts models (DPM) use a sliding window approach where the classifier is run at evenly spaced locations over the entire image [10]. More recent approaches like R-CNN use region proposal methods to first generate potential bounding boxes in an image and then run a classifier on these proposed boxes. After classification, post-processing is used to refine the bounding boxes, eliminate duplicate detections, and rescore the boxes based on other objects in the scene [13]. These complex pipelines are slow and hard to optimize because each individual component must be trained separately. We reframe object detection as a single regression problem, straight from image pixels to bounding box coordinates and class probabilities. So, we are using a machine learning model called YOLO – (YouLookOnlyOnce).
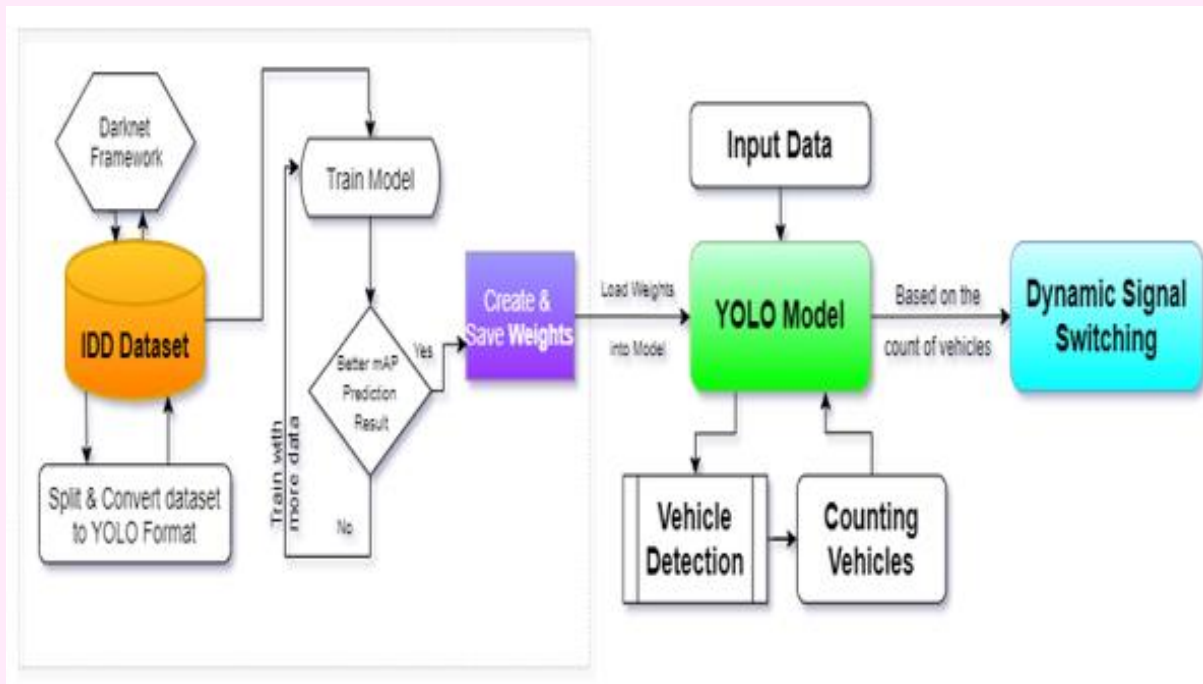
SMART STREET LIGHTING SYSTEM FOR SMART CITY

Submitted by
ADAIKKALARAJ.R
ANANTHA KUMAR.N
BARATH.J
KISHORE.B

ABSTRACT

Conventional street lighting systems in areas with a low frequency of passersby are online most of the night without purpose. The consequence is that a large amount of power is wasted meaninglessly. With the broad availability of flexible-lighting technology like light-emitting diode lamps and everywhere available wireless internet connection, fast reacting, reliably operating, and power-conserving street lighting systems become reality. The purpose of this project is to describe the Intelligent Street Lighting (ISL) system, a first approach to accomplish the demand for flexible public lighting systems.

SYSTEM ARCHITECTURE

The main aim of Smart Street Light is to reduce the power consumption when there are no vehicle movements on the road. The Smart Street Light will glow with high intensity when there are vehicles on the road otherwise the lights will remain dim. In addition to the reduction in power consumption, an Smart Street Light also provides a reduction in the maintenance cost since faults in the lamps can be easily detected and fixed.

Department of Information Technology
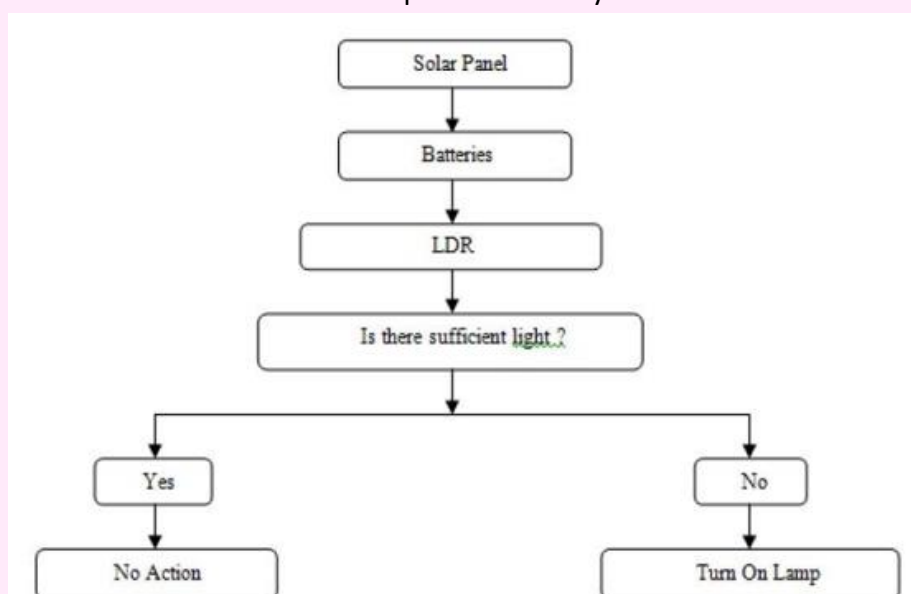
The main aim of this article is saving power. In this research, it is shown that most of the countries these days are aware of regular street light system which is not environmental friendly as well as not budget friendly too. For this work, LED lights are chosen over conventional lights because they do not emit any CO_2 and are friendly compared to the other light also controlling light intensity is easy with LED lights. As power saving is the main intention, solar energy is used as the power source along with the battery. This way of power supply saves lot of energy which comes naturally through the sunlight and it is very eco-friendly. Solar panels are used along with DC batteries. As the battery gets charged from the solar panel, it provided enough energy for the street light to get ON. To reduce the manual effort LDR is used to ON the light when it is night and OFF the light when it is day light automatically.

ACCIDENT ALERT SYSTEM USING IOT WITH GSM & GPS MODULES

Submitted by,

NIVEDHA R
PRITHIVI S
RAJESWARI G
VISHNU PRIYA B

ABSTRACT

With an increasing number of vehicles, the number of accidents is also increasing at an unprecedented rate. Each year, among the total number of deaths 1.24 million deaths occurred due to the vehicle accident. In India, the root causes of these accidents are due to the drunken driver, drowsiness, and badly designed speed breakers. There is no effective mechanism to prevent these root causes. Our proposed system provides an efficient, cost- effective and real-time solution to prevent vehicle accident. When reading goes beyond predefined threshold values, an alert gets generated and if a driver does not take some action in specified time then our proposed system will handle the situation by cutting the fuel supply. Our proposed system uses a microcontroller named Arduino along with Temperature sensor, vibration sensor, potentiometer, speed sensor, alcohol sensor, Light intensity sensor,rain sensor,heartbeat sensor,and GPS ,GSM. Arduino is used to regulate all these sensors.IOT module for updating all values of the sensors to the web page.

System Architecture

The proposed system it uses to receive alert and location about the vehicle after the accident being happened using the GSM and GPS modules that will be stored in the cloud, database and updated on the Web page. Aim is to receive the alert signal on which location, the accident being occurred. To know the details of the vehicles that gets involved in the accident and the damage level to both vehicle and human beings. By using GSM & GPS modules that will collect and store the details of accident that occurred. The collected data will be updated in the web page.
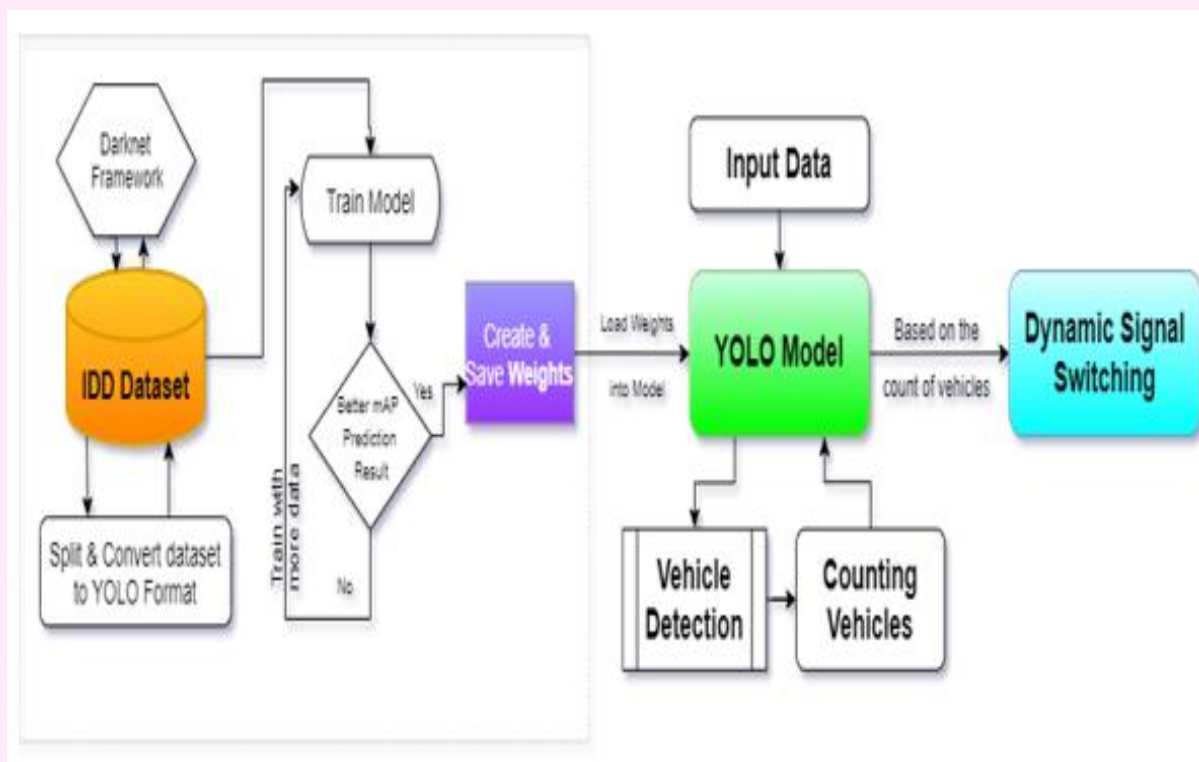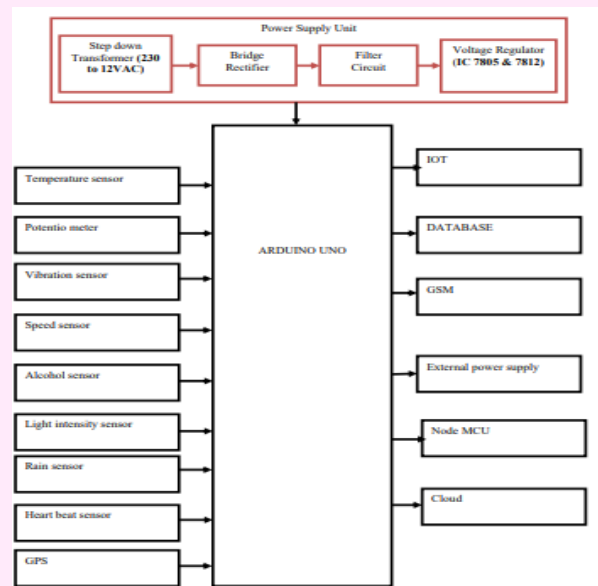
RECENT SOFTWARE

Bitdefender Antivirus Plus

Bitdefender Antivirus Plus is easy to get up and running with a simple installation process. (However, be aware that creating an online account, including an email address is required prior to the initial download and install.) Once installed, the high ease-of-use continues - Bitdefender makes it really easy to protect one's PC and keep us informed as to what threats are attacking us and when they're vanquished.

The sheer amount of features on offer in Bitdefender's entry-level antivirus package are manifold: Wi-Fi security scanning; banking protection; secure file deletion; vulnerability scanner; password manager; even the option to add a VPN into the mix.

Down sides are few and far between, but Antivirus Plus only protects three Windows devices without paying more for additional licenses, although there are some competitor products only protect one device. It is also resource intensive when running, which is a downside for older and less robust systems.

Cylvia Maybell N
Third Year IT-A

H2O.AI

H2O AI is for banking, insurance, healthcare, marketing, and telecom. This tool will allow you to use programming languages like R and Python to build models. This open source machine learning tool can help everyone.

Features:
- AutoML functionality is included.
- Supports many algorithms like gradient boosted machines, generalized linear models, deep learning etc.
- Linearly scalable platform.
- It follows a distributed in-memory structure.

Pros:
- Easy to use.
- Provides good support.

Cons: Documentation needs improvement.

Cylvia Maybell N
Third Year IT-A

PUZZLES

1. Find the missing Number?
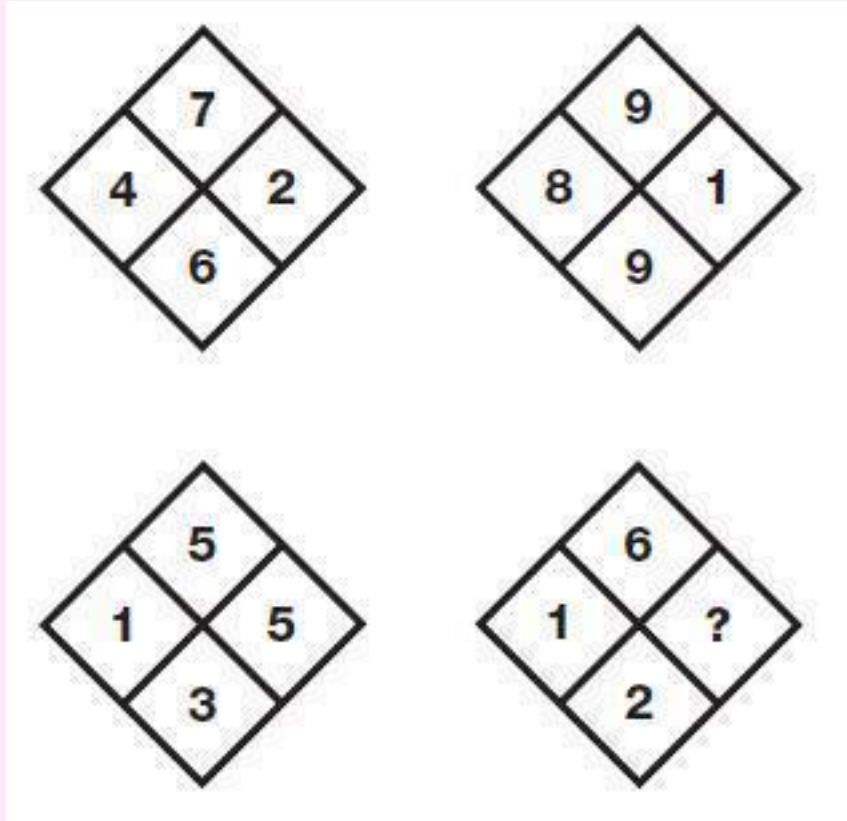
Answer:

7*6 = 4 2
9*9 = 8 1
5*3 = 1 5
6*2 = 1 2

2. How many squares do you see?
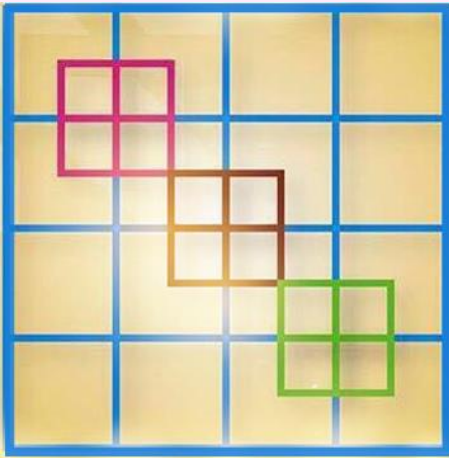
Answer: 45

3. Solve the Logical Puzzle?
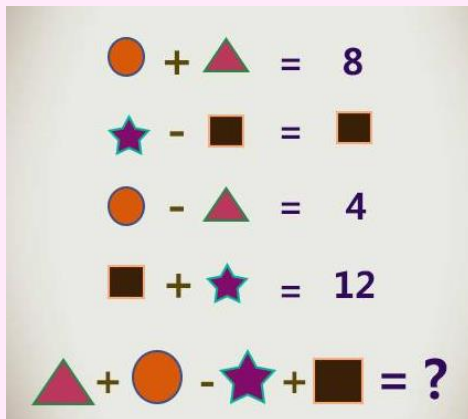
Answer: 4

Cylvia Maybell N
Third Year IT-A

1.A California farmer owns a beautiful pear tree. He supplies the fruit to a nearby grocery store. The store owner calls the farmer to see how much fruit is available for him to buy. The farmer knows the main trunk has exactly 12 boughs and each bough has exactly 6 twigs. Since each twig bears one piece of fruit, how many plums will the farmer be able to deliver?

Answer:

NONE - a pear tree doesn't grow plums.

2. I am beautiful, up in the sky. I am magical, yet I cannot fly. To people I bring luck, and to some people, riches. The boy at my end does whatever he wishes. What am I?

Answer:

A rainbow.

3. A girl says this to her best friend: "I was born in 1995, and I celebrated my 17 th birthday last weekend". Her best friend thinks she is lying, but she is actually correct. How is that possible?

Answer:

She was born in room 1995.

4. Nobody has ever walked this way. What way is that?

Answer:

The Milky Way.

5. I have branches, but no fruit, trunk or leaves. What am I?

Answer:

A bank.

6. I am an odd number, take away an alphabet and I become even, What number am I?

Answer:

7 (Seven; S=Even)

7. What has hands and a face, but can't hold anything or smile?

Answer:

A Clock.

S.Kayathri
III IT A

Poems
A Best Friend

A Best friend
Is always here
Whether you need advice,
Or a pep talk….

A Best friend
Knows all your secrets,
Understand your fear
Share your dreams….
And you are that
Kind of friend for me….

And no matter what happened,
You always will be
You are my friend..
My forever friend

-S.Avinesh

II IT - A

ஹைக்கூ

தேவையின் தேவை தேவைப்படும் போது
தேவை இல்லாததும் தேவையாய் தேவை படுகிறதே!!!!
அந்த தேவையை தேவையில்லாததாய் நினைத்து
உதறி விட்டு எனக்கு இன்று
அந்த தேவையில்லாததும் தேவையின் பயனாய்
இன்று தேவை ப்படுகிறதே!!!!!!

நம்பிக்கை

நோக்கம் எதுவென்பதை முதலில் தீர்மானி
அதுவே இலக்கு என்பதை உறுதி செய்து கொள்.
கையில் பணமில்லையே… உடலில் வலுவில்லையே…
உதவி செய்ய நண்பர்கள் இல்லையே…
என்றெல்லாம் யோசித்து நேரத்தை வீணாக்காதே
எதற்கும் பயப்படாதே…… ! தயங்காதே……..!
இலக்கை நோக்கி அடி எடுத்து வை
தொடர்ந்து முன்னேறு
சோதனைகள் விலகும் பாதை தெளிவு ஆகும்

நோக்கத்தை அடைந்தே திருவாய்
அதை யாராலும் தடுக்க முடியாது
உன் முயற்சி என்றும் தோற்காது   -C.Varsha II IT B

தாயின் மடியில்

கருவில் பிறந்து
உருவாய் வளர்ந்து
தரையில் தவிழுந்து
தாலாட்டில் மகிழ்ந்து- தாயின் மடியில்
நிலவில் சொறுண்டு
நாளொரு மேனியும்
பொழுதோரு வண்ணமுமாய்
அழகு பெற்றது- தாயின் மடியில்
என்நா இசைத்த
முதல் சொல்லும்
என் கரம் வரைந்த
முதல் எழுத்தும்- தாயின் மடியில்
பாலைவன சோலையிலே
பசுங்கிளியின் பாடலிலே
பருவ தென்றலிலே
பெற்றிடும் பேரின்பம்- தாயின் மடியில்
நன்மை தீமை பகுத்துணர்தது
எண்ணும் எழுத்தும் கற்றுணர்ந்தது
கதையும் கருத்தும் கேட்டறிந்தது
அன்பும் கருணையும் பெற்றோலிருந்தது- தாயின் மடியில்
வெற்றி பெற்று சாதித்தே போதும்
தோல்விகளை சந்தித்த போதும்
விளையாடி களித்த போதும்
தலை சாய்த்து அமர்ந்தது- தாயின் மடியில்
துக்கம் மறந்து
தூக்கம் தொடங்கி
கனவுகள் கணித்திடும்
இரவின் விடியல்- தாயின் மடியில்
கரையில்லா கடலாய்
பெற்றது அதிகம்- தாயின் மடியில்
வாழ்வின் பொருளை
வைத்தேன் அவள்தன்-காலின் அடியில்   -V.Avinash IV IT A

ART GALLERY
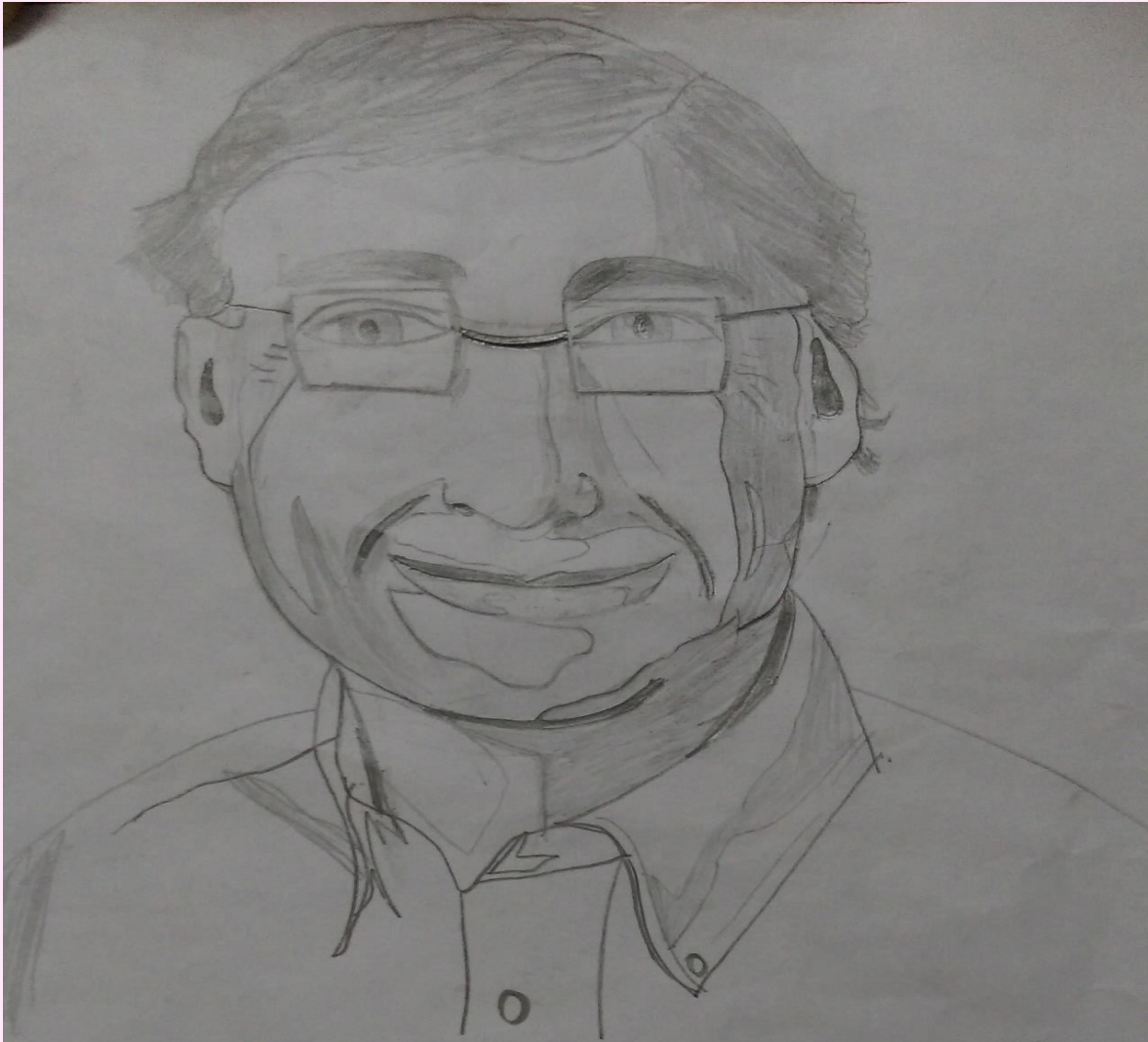
– E. Maalaiammal

BILL GATES :

If we stop emplaying foreign engineers especially from India.

Then, there will be another Microsoft born in India.

Department of Information Technology

-S.Kavi Priya II IT A
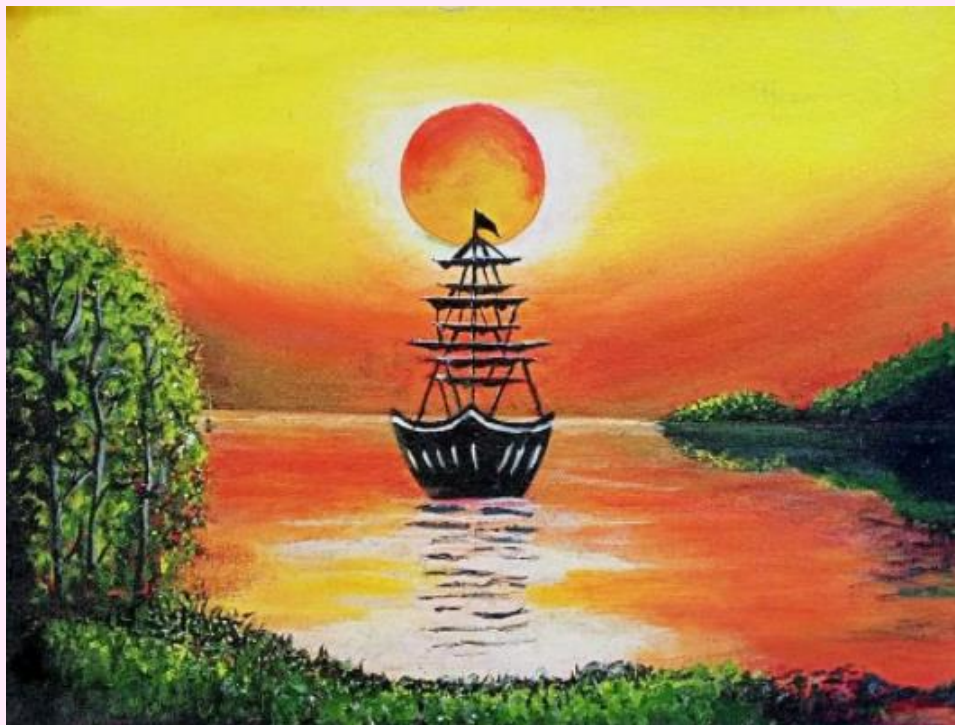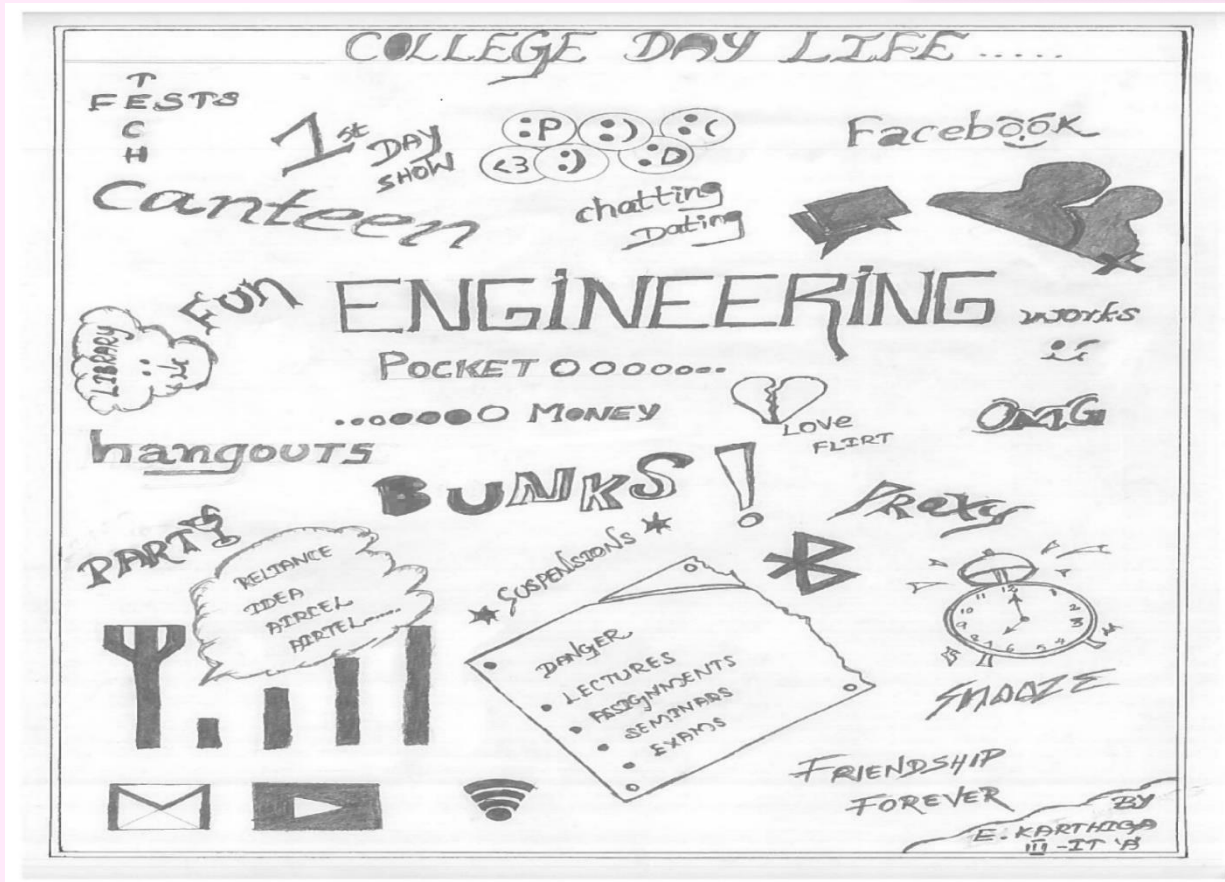
-R.Harshnni IV IT A

-R.Harshnni IV IT A

RECENT TOOLS

John The Ripper (Cyber Security):

  John the Ripper (JtR) is one of the hacking tools the used in the first Live Cyber Attack demo, and one of the most popular password cracking programs out there.

JtR supports several common encryption technologies out-of-the-box for UNIX and Windows-based systems. (ed. Mac is UNIX based). JtR autodetects the encryption on the hashed data and compares it against a large plain-text file that contains popular passwords, hashing each password, and then stopping it when it finds a match. Simple.

It demonstrates how to steal a hashed password, use JtR to find the true password, and use it to log into an administrative account.

JtR also includes its own wordlists of common passwords for 20+ languages. These wordlists provide JtR with thousands of possible passwords from which it can generate the corresponding hash values to make a high-value guess of the target password. Since most people choose easy-to-remember passwords, JtR is often very effective even with its out-of-the-box wordlists of passwords.

Azure

        Microsoft Azure is a cloud computing service that is used for designing, deploying, testing and managing web applications or hybrid cloud applications through Microsoft's global network of data centers.

Key Features:

- Microsoft Azure offers various services like mobile services, data management, storage services, messaging, media services, CDN, caching, virtual network, business analytics, migrate apps & infrastructure etc.
- It supports various programming languages (.NET, Python, PHP, JavaScript etc), widest range of operating systems (Linux, Windows etc), devices and frameworks.
- Detailed pricing information is available on their website. Sample example pricing for "App Service" is Rs 0.86/hour and that too its free for the first 12 months.
- Using Azure, we can easily spot the threats and lessen them, deliver the mobile apps flawlessly, manage the apps proactively etc.

Cylvia Maybell N
Third Year IT-A

ARTICLES

GOLDEN CHARIOT

Time was around nine o'clock in the evening when the Thiruvananthapuram-Cochin bye-pass rider pulled into the Vytilla Hub bus stand in Cochin. The bus was parked into position 13 that was located at North-East of the entrance. A wooden bench was placed a few feet away, in front of where the bus was parked, and a man is sitting on it fast asleep. He has brown eyes and black spiky hair, with an ID tag around his neck. He was wearing a purple shirt with black pants and shoes. The honking of a bus horn woke him abruptly from his sleep. He looked around wildly for a moment before realizing that it was simply a bus's horn. He stretched himself and got up from the bench. He took his laptop bag that he had had alongside him, and saw that the bus he had been waiting for had arrived and now is getting ready to leave. He had dozed off as he had had an extremely tiresome day. He hurriedly jogged towards the bus and got in. He sat on the seat that was four seats behind the driver. Something seemed really strange to Kevin as he got into the bus, as the color of the bus was flaming red, which was really odd as the Kerala Road Transport Corporation did not have any buses that had flaming red color as the body color.

The bus was completely empty except for him. It has been about four years since he had got into a bus. For the past four years, he had been travelling in his own or friend's cars. Today, his sister borrowed his car from him and had promised to pick him up from office. But all of a sudden she changed her plans and went with her friends to Goa without even having the decency to ask his permission before taking his car. He cursed under his breath as, he got into the bus. He hated traveling in public transports as it would be dirty and, because he felt that it was below his social status to travel in this piece of junk. Only the poor travelled in these and he was rich, or he thought until that day.

The bus rolled out onto the road crossed the Vytilla traffic signal and came to halt at the bus stop. A man got in and the bus continued along the highway. Although the bus was completely empty he sat next to Kevin. They sat in silence for sometime until the man noticed the ID around Kevin's neck which had his company name printed on it.

"The upcoming King of the software industry, or so it said in today's newspaper." , he said to Kevin and continued looking more closely at it, "and you're the General Manager of Sales. You really seem to be too overqualified to travel in a public transport". This was a statement from a completely strange man, who he had just seen on the bus. But still something about him made to recount his day and tell him all about his sister changing her plans all of a sudden. The man listened intently to it and then said,

"But why take the bus. You could have got yourself a taxi or called a friend."

"Taxi drivers are all on strike due to the sudden increase in fuel prices".

"Friends?", he asked, "What about them?"

"Busy partying" . He kept on looking at Kevin for sometime like he was looking for something.

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Kevin started feeling a little uncomfortable as he had just lied to him. He had informed a few guys and they were so drunk that they simply laughed it out. He had decided to board a bus as he was really helpless. The man seemed to have read his mind as he mumbled, *"A friend in need, is a friend indeed".* Kevin didn't want him to know that his friends had actually abandoned him, so he tried to make up by saying," It's not that they don't help me when I need them. It's because they all are busy".

"Partying".

"Yes, partying".

"So, tomorrow they will apologize to you that you had to take a bus as they were not available?" he asked. Kevin did not answer to this and his silence answered his question. The man then explained to him that the friends to whom you cannot discuss your downfalls with are not really your friends and it is rather better to cut off the ties with them.

"A person who makes others a laughing stock or hesitates from helping others who require it or backstabs the most important persons in your life for their own personal gains are nothing but inhuman people, who call themselves to be one of the most important persons in the society."

Kevin listened quietly to all of these as his inside was in turmoil. He was everything the man had just said. He had made the people close to him a laughing stock, refused to help a friend who required money to save his home. As a result of his decision to not help him, that guy and his family were on the streets. He had backstabbed and betrayed a few in his office to get to the General Manager post within just four years of being appointed as a Sales Executive. All these memories had started to make his heart feel heavy. He felt as if a heavy rock has been placed on top of it that had started to push it down. The man simply watched Kevin intently as he started feeling the waves of emotions happening inside Kevin.

"It is never too late to do the right thing. When you feel realize that the path you've taken is wrong, you could always go back and make it right. If you start doing the right thing you will get the opportunity to undo every wrong that you had ever done. You really think that the things you have owned by deceitful   methods will remain with you. It will be snatched away by someone, like you had done from someone else. You have simply started of a reaction that will come back to you and hit you with the same force. Newton's law can actually be applied to everything and not just science. Be good and do good, then good will happen to you."

Kevin started to feel a little dizzy because of all the emotions that were going through him. He was confused and didn't know how to react. A million questions were exploding in him but, all he could muster to ask was,

" Who are you?"

The man simply smiled and he started to glow. Not just him, but the entire bus, including the driver and conductor were glowing. A lot of light was filling in and his eyes started to hurt. A long lost memory came in where his grandmother had told about God. He couldn't bare the pain

in his eyes anymore and his senses started to wake. He opened his eyes and saw that the lights were simply the glowing headlights of the bus that had parked in front of him. He was sitting on a bench in Position 13 in Vytilla Hub. The long tiring day had sent him to a really deep sleep. The flaming red bus and the man was simply a dream. But it all seemed real and he knew for sure that it was a message to save himself and his soul. The memory of his grandmother that he remembered before waking was still fresh in his mind and his grandmother's words were still ringing in his ears,

"God shall come in a golden chariot to offer salvation to those souls facing damnation as there is still some goodness hidden in somewhere in their hearts."

NEW TECHNOLOGY

Hexa-X: 6G technology

Hexa-X, the European 6G research project driven by Ericsson and Nokia, with Ericsson assigned as the technical manager and Nokia as the overall leader, has ramped up its activities since its start in January 2021. Discover the latest on how 6G technology is being defined – from future use cases to technological enablers.

The vision and ambitions outlined in our previous blog post, Hexa-X – The joint European initiative to shape 6G, have guided the work as we've set out to start defining 6G. To lay the foundation, the project has begun by looking at potential 6G use cases and relevant performance metrics, as well as prospective technological enablers with a thorough state-of-the-art and gap analysis described in a first set of deliverables recently released.

6G use cases
The Hexa-X project has identified a plethora of prospective 6G use cases, which can be broadly categorized into five different use case families based on their addressed challenges or prospective technological enablers.

These use case families include:

Sustainable development: The novel capabilities envisioned for 6G will provide unprecedented opportunities to enable sustainable development in almost any facet of society or industry, leveraging on the possibility to collect data and actuate responses on a global scale. For example, the use case Earth monitor uses a global distribution of sensors to monitor environmental indicators; E-health for all has a goal to provide global access to e-

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health even to remote and underprivileged populations; Institutional coverage provides extreme performance to selected institutions in underserved areas; and Autonomous supply chain, can introduce AI/ML on a global scale to help reduce waste in production or logistics chains.

The global reach of these use cases can be facilitated with the incorporation of, for instance non-terrestrial networks (satellites or high-altitude platforms) or wireless backhaul into 6G, while artificial intelligence (AI) or machine learning (ML) functionality can ensure cost-effective data analysis.

Local trust zones: Certain use cases temporarily require extreme performance, for instance in terms of throughput, reliability, or security at levels that are infeasible to deliver with a wide area network. For instance, this could be in precision healthcare scenarios where in-body devices autonomously connect to a local hub which ensure that any confidential data remains local and private; Sensor infrastructure web, where ubiquitous sensors, both onboard and third-party devices are connected, authenticated and where sensor data is verified and integrated into a joint digital representation of the physical world; IoT micro-networks for smart cities, where simple IoT devices autonomously connect to each other to form local mesh networks without the need to densify the network; Infrastructure-less network extensions and embedded networks, where coverage is extended beyond the reach of edge, for example, by multi-hop self-relaying; Small coverage, low power micro-network in networks for production and manufacturing, for example. in a factory where multitudinous IoT devices are interconnected, relying on a locally leased spectrum; Local coverage for temporary usage where e.g. a local program making and special events (PMSE) requires interconnected recording and broadcasting equipment with extreme performance facilitated by, for example, temporary frequency licenses.

To facilitate a cost-effective deployment without necessitating deployment of dedicated custom-built networks, there needs to be possible to deploy a network of sub-networks, where the data and connectivity is kept at a local scale, while the configurations and management can be handled on a macroscopic scale.

Robots to cobots: With the advent of AI/ML and the proliferation of autonomous systems, robots will become much more ingrained in our societies and industries, including both consumer robots in our homes and public spaces, as well as complex industrial robots enabling flexible manufacturing. As their capabilities evolve, they will become responsible for even more complex tasks requiring tightly interacting and cooperative mobile robots (otherwise known as cobots), collaborating both with humans or other autonomous systems while solving to avoid detrimental incidents. Furthermore, many AI systems will exist solely as software, for example, in the cloud, acting as an AI partner assisting the user whenever interacting with a connected device or system.

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Massive twinning: The creation of a digital twin from humans, physical objects, and processes by capturing and modeling the physical world with sufficient fidelity, will allow unprecedented experiences and system insight and control. This includes both an extension of the digital twin concept of industrial processes introduced by 5G, applying the digital twin for manufacturing, but also an expansion to other fields of society. For instance, by applying digital twins to sustainable food production, the health, needs, and ailments of crops and livestock can be monitored in real time, autonomously administering nutrients/food and addressing any threat to increase the yield and reduce the waste.

In addition, it is envisioned that almost any aspect of an entire city could be digitally represented, allowing precise modeling, monitoring, and managing of almost any public or private service, such as utilities, public transportations, public health, or environmental and pollution monitoring for an immersive smart city.

Telepresence: To interact with, or experience the physical world remotely with lifelike fidelity will be a commonplace experience in the 2030s. This includes both virtual, augmented, and merged reality, where users can interact with digital replicas of other humans or objects in real time using multi-sensory interactions, extending the audio-visual experience with haptic or even olfactory experiences, creating a fully merged cyber-physical world.

The applications of telepresence will range from passive experiences by streaming content to your local AR/VR devices such as watching a show or presentation remotely, for example, in an immersive sport event, to fully immersive experiences, where your avatar captures and renders your every movement and allows seamless interactions with virtual objects, for instance, playing an immersive multi-player AR game in public, in a merged reality game or co-creating a digital prototype with haptic feedback with remote users enabling mixed reality co-design. This would require your local devices and applications to monitor and react to your local environment to properly position the virtual objects in relation to real objects.

Clearly, the list of potential use cases is far from complete, where some of the current use cases will become significantly more advanced and prominent in 2030, while other use cases will not even be invented until 6G systems are deployed.

Key values beyond connectivity
The evaluation metrics of 6G systems will need to be expanded beyond the classical key performance indicators (KPIs) as it will not suffice to simply design 6G as "X times 5G".

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In the Hexa-X project, we have identified an initial set of essential indicators for 6G. Evaluation metrics relate to different aspects of use cases and network performance, as indicated by the categorization in the figure below.

Extreme evolution of capabilities: As current use cases will continue to be of importance, the performance expectations related to data rates, connection density, traffic capacity or location accuracy will continue to be rise.

Revolution of new end-to-end measures: As the development of use cases continues, it may no longer suffice to suboptimize the network, only focusing on, for example, the air interface performance. Instead, a holistic approach – considering the end-to-end performance related to energy efficiency, service availability, determinism, or coverage, for example – needs to be taken to ensure reliable performance.

New capability areas: As 6G is expected to expand beyond connectivity, novel capabilities are expected to be introduced, such as pervasive integrated compute and AI, convergence of communication and sensing, as well as the embedding of energy harvesting devices. This can enhance the overall performance of the network, and the performance of traditional KPIs, as well as introduce novel domain-specific KPIs.

Key value indicator areas: As 6G is set to become an integral part of society, it will no longer suffice to only consider the technological performance metrics when designing and deploying the system. To this effect, the key performance indicators have been supplemented with key value indicators, encompassing aspects such as inclusiveness and acceptance, trustworthiness and sustainability.

To address the 6G use cases and KPIs/KVIs, the Hexa-X project will study technological enablers for 6G within several different technical areas. For some of these enablers, The Hexa-X project has recently released deliverables covering state-of-the-art and gap analyses, which we'll now look at. 'll now look at.

Radio performance towards 6G
Currently, the exploitation of sub-THz frequencies (100-300 GHz) for mobile communications is still in a nascent stage. Considering the challenges imposed by the laws of physics – in other words the generation, propagation, and reception of these frequencies – the design of commercially viable sub-THz communications systems will require a disruptive and holistic approach.

Hexa-X will systematically and jointly study waveform and modulation, radio channel characterization, beamforming and the feasibility of hardware, targeting sub-THz radio design as

a part of a 6G system. In particular, waveform and modulation beyond 5G NR will be researched in Hexa-X, which may require adoption in 3GPP standards with respect to 6G air-interface design above 100 GHz.

Apart from wireless communication, Hexa-X will also study the use of mm-wave and sub-THz bands for the development of low-cost, energy-efficient, and high-performance positioning solutions with the precision of <1 cm, while accomplishing unnoticeable delays and having strong privacy awareness. The intent is to make localization and sensing as key features of 6G communication systems by design.

The Hexa-X project recently released a deliverable covering initial radio performance aspects of 6G entitled, "Towards Tbps communications in 6G: Use cases and gap analysis".

Most notably, the expansion into sub-THz frequencies necessitates a shift in application arising from the associated propagation properties, as well as the larger bandwidths. As such, the Hexa-X project has identified three different classes of use cases applicable to sub-THz frequencies:

- **Short range:** Both indoor device-to-infrastructure, as well as device-to-device communication, would benefit from the larger throughput while line-of-sight connectivity could be ensured.
- **Long range:** For fixed wireless links, the unprecedented bandwidths could ensure sufficient capacity for wireless backhauling, while mobile wireless links to non-terrestrial network nodes, such as satellites or high-altitude platforms (HAPs) could provide excellent performance for outdoor coverage.
- **Sensing:** By repurposing the received signal, the network would be able to infer information about the device location, as well as the surrounding environment with the existing radio interface operating as a radar receiver. As the sensing resolution is proportional to the signal bandwidth, the available bandwidth at sub-THz frequencies can provide much better performance than at lower frequencies. In addition, given the intrinsic frequency dependent reflection of different materials, the sub-THz signals can also be used for inline spectroscopic analysis.

Advances in network evolution and expansion

It's expected that 6G networks will expand into new special-purpose network solutions and towards full worldwide coverage at the same time. To meet these goals, the 6G network needs to be designed to be able to seamlessly integrate a wide range of devices and sub-networks with integrated and distributed AI functionality. To enable this the project will explore for instance device programmability in dedicated networks and streamlined cloud-native radio access and core network architectures which will help to increase deployment and operational flexibility. To

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expand into new and specialized application domains, special-purpose network solutions need to be enabled with 6G. To expand beyond the digital world towards a fully interconnected fabric, enablers for human-machine interaction and fully immersive digital twins are required.

The way forward towards 6G

As shown from these initial deliverables, the work on 6G is ramping up where the research gap analysis points towards the areas to focus on. Additional gap analysis deliverables will be released later this year, covering aspects of Localization and sensing, AI-driven communication and computation co-design, and initial 6G architectural components and enablers. Following these initial reports, the Hexa-X project will steer the work towards explorative research towards technological enablers which aim to close these research gaps to lay the foundation for future 6G systems.

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