

e-SRUSHTI

An Innovative Bucket...

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NARAYANA ENGINEERING COLLEGE :: NELLORE

AUTONOMOUS



Vision of the Institute

To be one of the nation's premier Institutions for Technical and Management Education and a key contributor for technological and Socio-economic development of the nation.

Mission of the Institute

- To produce technically competent Engineers and Managers by maintaining high academic standards, world class infrastructure and core instructions.
- To enhance innovative skills and multi disciplinary approach of students through well experienced faculty and industry interactions.
- To inculcate global perspective and attitude of students to face real world challenges by developing leadership qualities, lifelong learning abilities and ethical values.

Vision of the Department

To produce technically competent and creative engineers who can cater to the industry and societal requirements in the field of Electronics & Communication Engineering.

Mission of the Department

- To impart quality engineering education to students to enhance ability to pursue knowledge by providing core competency and state of the art infrastructure.
- To provide industry oriented learning for empowering and facilitating the learner through industry institute interaction and leadership qualities.
- To promote participation in research and extension activities for addressing the social needs by providing value based education along with life-long learning abilities.

Program Educational Objectives (PEOs)

PEO_1: Attain professional excellence or gain higher degree to face challenges posed by industry and society.

PEO_2: Address complex problems in a responsive and innovative manner.

PEO_3: Gain reputation by functioning effectively to address social and ethical responsibilities.

Program Specific Outcomes (PSOs)

PSO_1: Domain Specific Knowledge: Implement electronic systems related to Electronics Devices & Circuits, VLSI, Signal processing, Microcomputers, Embedded and Communication Systems to fulfill the solutions to real world challenges

PSO_2: Hardware Product Development: Apply the software and hardware tools in Analog and Digital Electronic circuit design to address complex Electronics and Communication engineering problems.

Program Outcomes(POs)

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal & environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Professor Desk



Welcome to the Department of ECE at Narayana Engineering college, nellore. This magazine will be covering activities conducted by e-SRUSHTI and technical articles written by students.

During these testing times of COVID pandemic, our regular academic activities were a challenge, but we managed to keep this remain unaffected as per schedule due to the relentless efforts of the teaching faculty, supporting staff as well as our beloved students. I sincerely appreciate the support extended by each one during these testing times and take this opportunity to wish everyone safe and protected well being with your dear ones.

Dr. K. S. Sagar Reddy

**Professor,
Dept. of ECE.**



**DEPARTMENT OF ELECTRONICS &
COMMUNICATIONS ENGINEERING**

OTA podium for IoT security and deployment

During the initial phase, the Internet of Things (IoT) was not that charismatic and modernized because, during that time when a remote device required firmware update, there were numerous technological disruptions, performance impact, and compute or reckon with downtime

Over-the-air (OTA) is the capability of wirelessly downloading an application, configuration, or firmware, to internet-enabled devices, popularly known as IoT. It works in a similar fashion as our computers, laptops, tablets, and phones get updated.



IOT Deployment for Security

Apart from this, a diminutive alteration required human involvement and in the majority of cases, on-site people are needed to monitor the problems and they had to ensure that the changes are not troubling the entire system.

The device that requires software updates needs to be extracted and even knockdown if the situation demands it. Manual works are needed even if you are running scores of connected devices or unleash an update to a particular device group. Challenges arise when devices at several sites require updating or at extremely far-off areas.

In these scenarios, organizations have two choices: their systems can be crafted for deploying over-the-air(OTA) updates or to purchase an already available cutting-edge OTA solution.

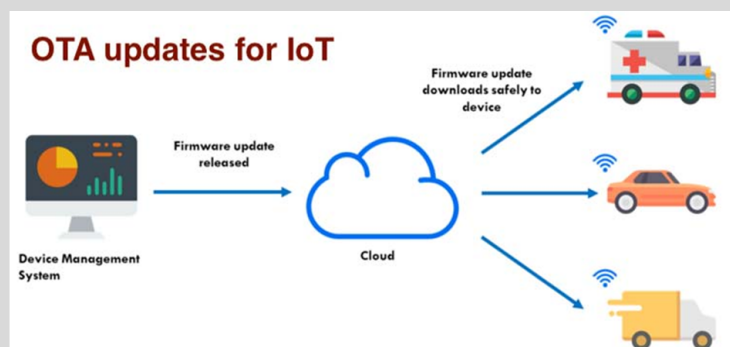
Now, as the world is now moving towards 5G, the growth of IoT has been escalating tremendously where billions of new-fangled devices will be connected. In the age of innovation and development of top-notch technology, OTA updates are mandatory as experts opine. Over the past twenty year.

For instance, inside the mobile phone, SIM cards act as a mini-computer as it has all the important configuration files and credentials that helps the product to operate seamlessly both in terms of connectivity and security.

Since the time of 2G, the solution is helping the sector. The few updates of IOT are:

OTA UPDATES FOR IOT:

The OTA helps operators to unleash a new SIM or help them alter their SIM card's content swiftly and in a cost-effective manner. This platform is plotted on service or client architecture where there is an operator back-end system like application server, customer billing, and billing system and also there is a SIM card on the other hand. The back-end system then provides service requests to the OTA platform, which after changing it into small messages forwards them onto a short message service center, thereby transmitting them to numerous SIM cards in the area



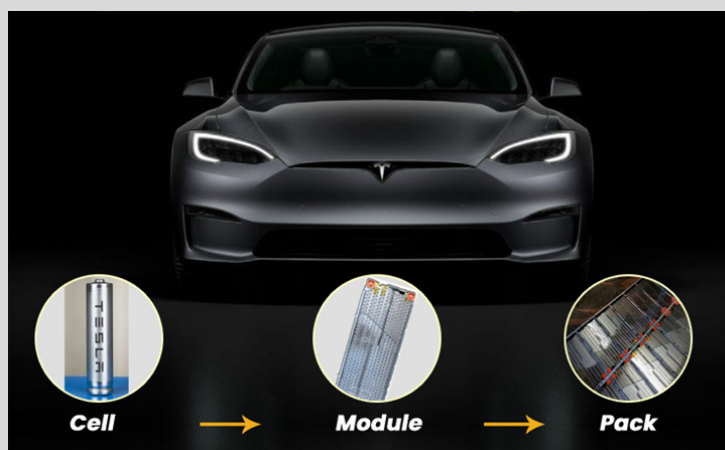
18711A0431, D. Jyothsna, III ECE-A

Tesla Model S battery System: An Engineer's Perspective

Tesla makes a highly modular battery pack with high efficiency, reliability, and safety features. As explained above, the battery pack is made up of up to 16 modules connected together in a series. The voltage of a Tesla's battery pack is around 400 Volts and it is the single most heavy component, and all the different versions of the same cars might have a different battery pack, thus changing the weight and capacity of energy storage.

For Eg. the Model S P85's battery pack has a capacity of 90 kWh and weighs over 530 kgs. It contains 16 modules, which are 7104, 18650 cells. The battery pack has a central bus bar that connects each battery module with a contactor that feeds both the front and rear electric motors. Since each module is 5.5 kWh and we have 16 of those in a 90KWh Tesla battery. Thus making it an 84kWh module.

The Tesla Model S multiple 18650 cells to make the battery pack. But rather than arranging all the cells and making a single big battery, Tesla uses multiple smaller batteries called the battery module to make the final battery pack. Each module has a 6S 74P configuration, i.e. 6 cells are connected in series and each of these series has 74 cells connected in parallel. Each of Tesla's modules is rated for 500A of continuous current with 750Amps of peak current. There's a liquid cooling integrated in order to maintain the temperature of the battery pack. The below image shows a single module of a Tesla Battery Pack.



Tesla Model S battery System

18711A0459, Harikiran, III ECE-B

Chip-to-cloud Security

IoT devices have now turned to be an essential part of our daily lives, which is also transforming our cities, offices, and entire house into a smart habitat. According to researchers, in the coming few years, all the devices will be connected to each other and to accomplish this task, the electronic items require to be extremely smart and secure. Hackers are targeting IoT devices massively on a daily basis and hence, any company utilising or making an IoT device has to focus and prioritize on top-notch security.

Chips are the most worried aspect because it is now the backbone of every electrical and electronic goods. According to a report of international research and intelligence firm IoT Analytics, in the last 26 years around 100 billion ARM-based chips were shipped, but now the growth has exceeded to such an extent that in the last four years, another 100 billion ARM-based chipset were shipped globally. By the end of 2021, there will be 12.3 billion connected devices and towards the end of 2025, the volume will exceed 25 billion. With the escalation of connected devices more chipsets are deployed in the market and they are not at all secured from a hardware perspective.

The more vulnerabilities in the market, the more unsecured will be your deployments, systems, and solutions. Satyajit Sinha - Senior Analyst - IoT Analytics told CircuitDigest, "It is very imperative to secure the IoT ecosystem. Traditionally, securities are only software securities or firewalls, but IT demands a robust security. The systems will generate much more data and more devices will be connected and so, securing just one system will not solve the painpoint. Nonetheless, we need to take the approach of four layers of security, hardware, software, network, and cloud."

The Latest and Current Layers of Security for IoT Devices :

If you are deploying a new solution, then it is preferable to deploy an embedded solution, which is embedded within the secured MCU or SoC.

The point to be noted is that there is already an existing solution, but an embedded solution cannot be implemented on top of that and hence,

Hardware Security Module (HSM) always makes sense and it will provide an equal amount of security.

Then, the software security can be implemented on top of a secured MCU embedded like an Azure-based device. This implementation tracks and creates the data aberration. Cloud security is also an integral part of hardware security as well.

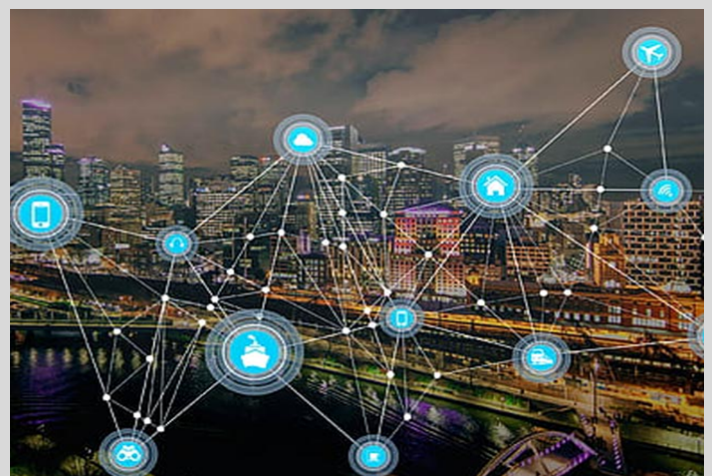


Chip & Cloud Computing

The pillar of hardware security enables the "hardware root of trust" that utilises asymmetric encryption. A hardware root of trust is the platform on which all secure operations of a computer system rely.

It contains the keys used for cryptographic functions and enables a secure boot process and on the other hand, a secure tunnel is also crafted for the secure flow of data from chip to the cloud, ensuring data security at rest and in transit.

There is a tamper-resistant secure platform, known as Secure Element (SE) that has the potential of hosting various applications in a very secured way and also their cryptographic and classified data following the security necessities and rules established by the verified authorities. Another uniqueness of SE is that it can be utilized in numerous form factors (UICC(SIM), embedded secure element, and micro-SD)



Data Transfer from different Sources

19715A0409, T. Bhanuprakash,
III ECE-B

How Electric Vehicles are Leveraging Artificial Intelligence to Improve battery Performance and Charging.

We know, the Electric Vehicle revolution is speeding up all over the World and different models are out there in the market. EVs are expected to attain price parity with traditional combustion- engine vehicles within the next five years and a major credit of this goes to the role of Artificial Intelligence. AI is poised to give electric vehicles a boost by hastening advancements in battery technology. According to worldwide market estimates, the AI in Automotive Market would develop at a CAGR of more than 35 percent between 2020 and 2026.

AI is extensively used in manufacturing, assembly lines, and many EV players are testing self-driving EVs to gather data, analyze and repair Electric Vehicles.

With AI and machine learning, Electric Vehicle manufacturers have the ability to process massive amounts of sensor data faster than ever before, giving companies an unprecedented chance to improve upon existing maintenance operations and even add something new – predictive maintenance.

How AI is Accelerating the Power of EV Batteries:
In every aspect of a vehicle's life, battery performance is a crucial factor to consider. The battery accounts for 25% of the entire cost of an electric vehicle and when it comes to EV developments, nothing is more important than increasing battery life.

Artificial intelligence has made aspirations like recharging an electric vehicle in the time it takes to stop at a gas station a reality, and it might help enhance other elements of battery technology as well. The scope of the global battery market is rapidly increasing. EV models like Tesla S 100D offers 355 miles, Hyundai Kona offers 198 miles, or MG ZS EV could offer 214 miles on average and none can be fully charged in a matter of minutes.

For instance, at Tesla supercharging station, EVs will take 75 minutes to reach full charge, and Indian players in the EV industry would require more than 3 hrs for a full charge.

With various applications such as Autonomous driving, user behaviour monitoring, and Smart navigation systems, AI is playing a key role in the EV Industry. It can be used for safety applications like predictive maintenance of equipment, driver behaviour monitoring, and vehicle security. Different companies are using Artificial Intelligence in their vehicles, some use this technology to change current transportation systems with self-driving services, while some use it for strengthening the battery power of their EVs.



EV with AI for Battery Charging

17711A0465, C. Ganga Pravallika,
IV ECE-B

Bubble Power

Sonofusion is technically known as acoustic inertial confinement fusion. In this we have a bubble cluster (rather than a single bubble) is significant since when the bubble cluster implodes the pressure within the bubble cluster may be greatly intensified.

The centre of the gas bubble duster shows a typical pressure distribution during the bubble duster implosion process.

Gravity Light

This large local liquid pressure 1000 bar) will strongly compress the interior bubbles with in the cluster, leading to conditions suitable for thermonuclear fusion.

More over during the expansion phase of the bubble duster dynamics, coalescence of some of interior bubbles is expected, and this will lead to the implosion offairly large interior bubbles which produce more energetic implosions.

The apparatus consists Of a cylindrical Pyrex glass flask 1 00 m.m. in high and 65m.m.in diameter. A lead-zirconate-titanate ceramic piezoelectric crystal in the form Of a ring is attached to the flasks outer surface. When a positive voltage is applied to the piezoelectric ring, it contracts; when the voltage is removed, it expands to its original size.

The flask is then filled with commercially available deuterated acetone (C 3 D 6 O), in which 99.9 percent Of the hydrogen atoms in the acetone molecules are deuterium (this isotope Of hydrogen has one proton and one neutron in its nucleus). Also the deuterated fluid can withstand significant tension (stretching) without forming unwanted bubbles.

The substance is also relatively cheap, easy to work with, and not particularly hazardous.

When you hear the phrase "alternative energy," chances are your mind goes to windmills and solar panels, or perhaps fields of corn. The Gravity lamp is powered by the falling motion Of some weights, also known as gravity. Its an interesting idea, using a (presumably) limitless resource like the pull of gravity to generate power. And while the Gravity lamp requires some advances in technology before it becomes a viable product, the concept is worth checking out. In this article, we'll get into the Gravity lamp and see what makes it glow, and we'll find out why a gravity-powered lamp may be an alternative-energy gadget to keep an eye out for.

A person attaches five 10-brassbound weights to a ball screw near the top of the lamp. The platform immediately starts dropping along the screw, which is aligned along the length of the lamp. As the platform makes its way down the screw, the screw spins.

This converts the downward motion of gravity (acting On the weights) into the rotational motion needed to spin the gear near the bottom Of the lamp. The spinning gear in turn spins a generator a rotor/stator assembly that converts the rotational motion into electricity. The electricity powers 10 LED bulbs, which light up and illuminate the acrylic housing of the lamp



Working of Sonofusion



Gravity powered light

17711A0432, K. Surekha,
IV ECE-A

17711A0450, N. Sai Sumanth,
IV ECE-A

Money pad - Future Wallet

Money in the 21st century will surely prove to be as different from the money of the current century as our money is from that of the previous century. Just as fiat money replaced specie-backed paper currencies, electronically initiated debits and credits will become the dominant payment modes, creating the potential for private money to compete with government-issued currencies. Just as everything is getting under the shadow of "e" today we have paper currency being replaced by electronic money or e-cash. Hardly a day goes by without some mention in the financial press of new developments in "electronic money". In the emerging field of electronic commerce, novel buzzwords like smartcards, online banking, digital cash, and electronic checks are being used to discuss money. But how are these brand-new forms of payment secure? And most importantly, which of these emerging secure electronic money technologies will survive into the next century?



Money pad - Future Wallet

These are some of the tough questions to answer but here's a solution, which provides a form of security to these modes of currency exchange using the "Biometrics Technology". The Money Pad introduced here uses the biometrics technology for Finger Print recognition. Money Pad is a form of credit card or smartcard, which we name so.

Every time the user wants to access the Money pad he has to make an impression of his fingers which will be scanned and matched with the one in the hard disk of data base server.

If the finger print matches with the used he will be allowed to access and use the Pad otherwise the Money Pad is not accessible. Thus providing a form of security to the ever-lasting transaction currency of the future "e-cash" Money Pad - A form of credit card or smart card similar to floppy disk, which is introduced to provide, secure e-cash transactions.

17711A0413, G. Venkata Suresh,
IV ECE-A

GI-Fi Technology

Gi-Fi will help to push wireless communications to faster drive. For many years cables ruled the world. Optical fibers played a dominant role for its higher bit rates and faster transmission. But the installation of cables caused a greater difficulty and thus led to wireless access. The foremost of this is Bluetooth which can cover 9-10mts. Wi-Fi followed it having coverage area of 91 mts. No doubt, introduction of Wi-Fi wireless networks has proved a revolutionary solution to "last mile" problem. However, the standard's original limitations for data exchange rate and range, number of changes, high cost of the infrastructure have not yet made it possible for Wi-Fi to become a total threat to cellular networks on the one hand, and hard-wire networks, on the other. But the man's continuous quest for even better technology despite the substantial advantages of present technologies led to the introduction of new, more up-to-date standards for data exchange rate i.e., Gi-Fi.

3D Scanning Technology – The present Scenario and Future Expectations

When we talk about the most impactful technologies of today that have a very bright future.

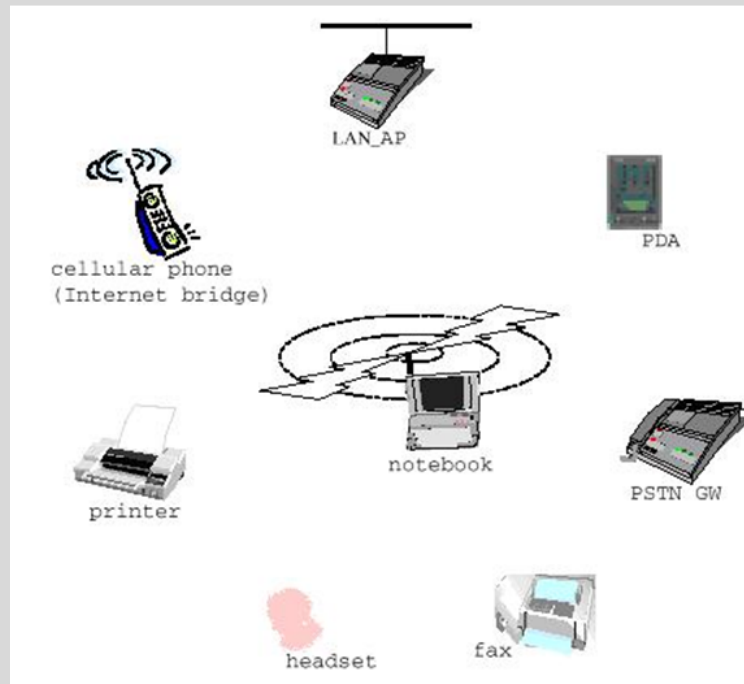
Advantages of 3D Scanning Technology

Various industries including automotive, aerospace, medical, and manufacturers are making optimum use of the 3D scanning technology for inspection of parts, accurate measurement, and other purposes. Depending on the type of scanner being used, 3D scanning technology offers immense benefits in terms of saving time and resources. Also, it can be used for recreating designs and parts that do not exist. In other words, it can be used to reverse engineering a new part that may no longer be available in the market. Other than this, the exact replacement parts can be created using 3D scanning technology.

The technology can help in quickly capturing all of the physical measurements of any physical object, ensure the parts are designed so accurately that they can fit together in the first go. Besides, it can help in capturing engineering optimizations inherent in manufactured parts. It can also be utilized for modern manufacturing on parts that were originally manufactured before CAD and comparison can be made between as-designed models to the as-built condition of manufactured parts.



3-D Scanner



Gi - Fi Access Devices

Gi-Fi or Gigabit Wireless is the world's first transceiver integrated on a single chip that operates at 60GHz on the CMOS process.

It will allow wireless transfer of audio and video data up to 5 gigabits per second, ten times the current maximum wireless transfer rate, at one tenth of the cost, usually within a range of 10 meters. It utilizes a 5mm square chip and a 1 mm wide antenna burning less than 2m watts of power to transmit data wirelessly over short distance, much like Bluetooth .

The development will enable the truly wireless office and home of the future. As the integrated transceiver is extremely small, it can be embedded into devices. The breakthrough will mean the networking of office and home equipment without wires will finally become a reality. a low cost, low power and high broadband chip, which will be vital in enabling the digital economy Of the future

17711A04B1, V. John Kamal
IV ECE-A

18715A0403, N. Haritha,
IV ECE-B

Electric Planes -

The future of the aviation industry

Electric flights, maybe? Aviation is one of the biggest contributors to carbon emissions and people are becoming aware of how conventional flights are posing risk to the environment. Besides, nitrogen oxides and particulates emitted by aircraft when they reach cruising altitudes which adds to the global warming effect. Airplane emission is on a rise of about 4.3 % and speculations are that by 2050, it will rise to 25 % of the world's carbon emissions.

Obviously, shunning travel by planes is not a long-term solution. Many aviation manufacturing companies are trying their hand on electric flights and assuring people that the dream of electric flights is sure going to be a reality soon. However, there are many hurdles and we need to understand how far is this true.

Electric Planes:

Our Future Flight The concept of electric planes that may be rightly called zero-emission planes is similar to the electric cars in which large chargeable batteries are needed. Unlike, the flights that use traditional fuel to power leading to huge carbon-emissions, the electric planes use large batteries that are easily chargeable and lead to no carbon emissions. Electric planes are perfect for trips within a range of 1,000 miles or less on a single charge which definitely is a big hurdle in making electric flights a reality.

Alice an electric plane (shown below), for example, is a nine-seater electric plane that can seat nine passengers and is powered by a lithium-ion battery. It can fly for 650miles at 10,000ft and 276mph on a single charge. It can be powered by three propellers on the wingtips and rear fuselage. However, by shifting 1,000-mile trips away from fossil fuels, the overall emissions could be cut by 2040 by about 4-8%. EasyJet, a British low-cost airline, will start using zero-emission electric-powered aircraft by 2027 on routes less than 300 miles and the distance will increase with the advancement in battery technology.

Aviation Companies that have Tested Electric Planes So Far

To potentially reduce emissions and operating costs by over 75 %, aviation companies around the world are testing electric planes. These electric planes are not limited to researchers and startups in fact; many aviation giants like Boeing, Airbus, and Raytheon are also experimenting with zero-emission planes. Boeing is working on the SUGAR Volt plane (expected to be released by 2040) which works somewhat on both electricity and fuel as a hybrid car. Airbus started its electrification journey in 2010 by developing the world's first fully-electric, four-engine aerobatic aircraft, CriCri. Thereafter, it came up with CityAirbus, Vahana, and E-Fan X (shown below). Airbus aims to make the technology available to fly a 100-passenger aircraft based on electric and hybrid-electric technology by 2030.



18711A0490, A. Sai Kumar, III
ECE-B

5 Pen PC Technology

When writing a quick note, pen and paper are still the most natural to use. The 5 pen pc technology with digital pen and paper makes it possible to get a digital copy of handwritten information, and have it sent to digital devices via Bluetooth.

P-ISM (Pen-style Personal Networking Gadget Package), which is nothing but the

the new discovery which is under developing stage by NEC Corporation. It is simply a new invention in computer and it is associated with communication field.



5G Pen

Working Principle:

A computer that utilizes an electronic pen (called a stylus) rather than a keyboard for input. Pen computers generally require special operating systems that support handwriting recognition so that users can write on the screen or on a tablet instead of typing on a keyboard. Most pen computers are hand-held devices, which are too small for a full-size keyboard.

How does it work?

The P-ISM (Pen-style Personal Networking Gadget Package) consists of a package of 5 pens that all have unique functions, combining together to create virtual computing experience by producing both monitor and keyboard on any flat surfaces from where you can carry out functions that you would normally do on your desktop computer. P-ISM's are connected with one another via a short-range (Bluetooth) wireless technology. The whole set is connected to the Internet through the cellular phone function

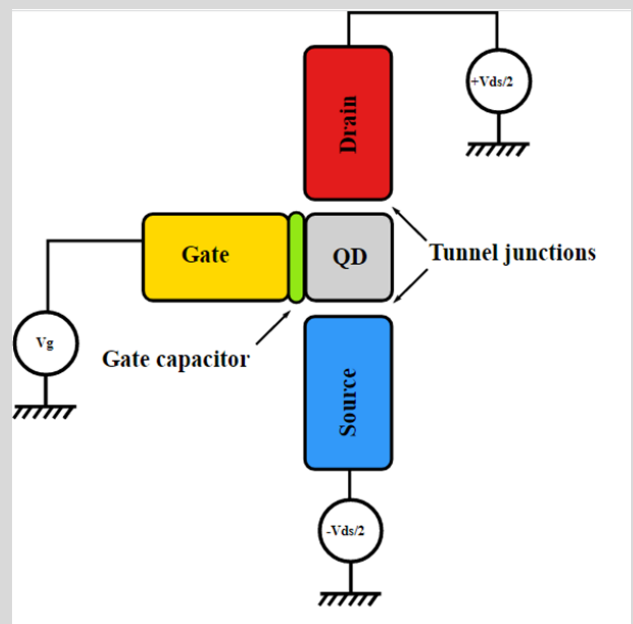
The five components of P-ISM:

- CPUpen,
- Communication pen,
- Virtual keyboard,
- LED projector,
- Digital camera

Single Electron Transistor

Single electron transistor (SET) is a novel idea and has been intensively studied. This review gives a general picture of SET, such as its mechanism, fabrication, application and problems faced. During 1980s, the main discoveries in mesoscopic physics are the tunneling of single electron and Coulomb blockade phenomena, which make many scientists predict, it is highly possible to produce applicable single electron transistor (SET) which works above liquid nitrogen temperature.

Since then SET has been a hot research area. A conventional field-effect transistor, the kind that makes all modern electronics work, is a switch that turns on when electrons are added to a semiconductor and turns off when they are removed. Electron transport properties of individual molecules have received considerable attention over the last several years due to the introduction of single-electron transistor (SET) devices which allow the experimenter to probe electronic, vibrational or magnetic excitations in an individual molecule. In a three-terminal molecular SET the molecule is situated between the source and drain leads with an insulated gate electrode underneath. Current can flow between the source and drain leads via a sequential tunneling process through the molecular charge levels, which the gate electrode is used to tune.



SET Transistor

19711A0495, Sk. Abdul Raheem,
II ECE-B

19711A0465, M. Kavya Jahnavi

Satrack

SATRACK is a system that was developed to provide an evaluation methodology for the guidance system of the ballistic missiles.

This was developed as a comprehensive test and evaluation program to validate the integrated weapons system design for nuclear powered submarines launched ballistic missiles .

This is based on the tracking signals received at the missile from the GPS satellites. SATRACK has the ability to receive record, rebroadcast and track the satellite signals.

SATRACK facility also has the great advantage that the whole data obtained from the test flights can be used to obtain a guidance error model. The recorded data along with the simulation data from the models can produce a comprehensive guidance error model. This will result in the solution that is the best flight path for the missile.

The present day ballistic missiles are all guided using the global positioning system or GPS. GPS uses satellites as instruments for sending signals to the missile during flight and to guide it to the target.

This seminar deals with the measurement concept that tests the missile accuracy. SATRACK receives, rebroadcasts, records and tracks the satellite signals sent by the GPS signals. The reception and rebroadcast of the signals is done by a missile hardware called the GPS translator.

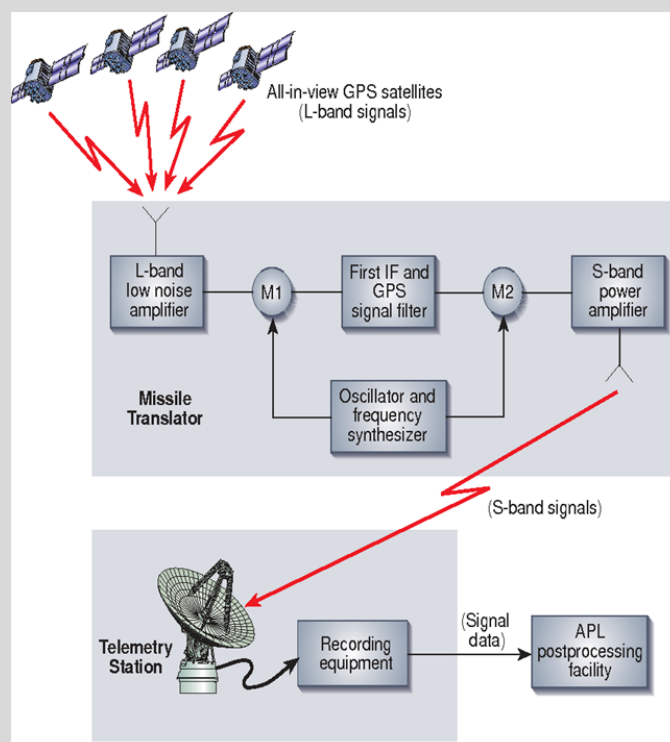
The ground telemetry stations consist of the RF antenna and recorders for the data. Post-flight processing and modelling are done later at the SATRACK Facility. Also the major error contributors to the missile flight are determined by the modelling done. There is extensive use of simulated signals in this method.

This seminar also throws light on the major breakthrough technologies that were developed during the research leading up to the final form of this technology.

According to the dictionary guidance is the 'process of guiding the path of an object towards a given point, which in general may be moving'.

The process of guidance is based on the position and velocity of the target relative to the guided object.

To simplify the missile hardware, the SATRACK system is based on simply relaying satellite signals to the two support ships (see Fig. 1). The signals from a satellite as received at the missile are converted to a different frequency and retransmitted to the support ships.



Block Diagram of Satrack System

19711A0405, A. V. Sai Pavan
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